

### 3.0 THE YEAR 2015 KCSE EXAMINATION QUESTION PAPERS

#### 3.1 ENGLISH (101)

##### 3.1.1 English Paper 1 (101/1)

- 1 You are the secretary of the Young Farmers Club in your school. The club has just held its meeting. The patron of the club and eight of its ten members attended. The deputy principal also attended. During the meeting the issue of starting a fish pond was revisited. Members also discussed the following issues: club's financial status, members' annual trip and sale of club's farm produce.

Write down the minutes of the meeting. (20 marks)

- 2 Read the passage below and fill in each blank space with the most appropriate word. (10 marks)

The positive way to react to disappointment is to use it as a (1)..... for growth. This is not easy, but it is the only way to deal with an (2)..... aspect of life. Helen, the woman who was not promoted, could have (3)..... her disappointment by looking at other (4)..... For instance, if her boss did not recognize her talent and hard work, (5)..... she could transfer to another department or ask the boss how she could improve her performance in order to be a candidate (6)..... the next promotion. Jamal, the young man who did not (7)..... into the college of his dreams, should look into other institutions of higher learning. Going to another college may encourage him to be his (8)..... man, step out of his brother's shadow, and realize that being turned (9)..... by one college is not a final judgement on his abilities or potential. Disappointments in life can make us bitter or better, (10)..... we become victims or victors is our choice.

Adapted from: *College Writing Skills with Readings*, Sixth Edition. Newyork: Lisa Moore (2005) by Langan John.

- 3 (a) Study the passage below, which is about negotiation and conflict resolution, and then answer the questions that follow.

One evening Linda was walking down a desolate, dangerous block lined with abandoned, boarded-up buildings when suddenly, out of nowhere, she was surrounded by three boys about fourteen years old. One pulled out a knife with a four-inch blade as they pressed around her.

“Give me your purse! Now!” the boy with the knife hissed.

Though frightened, Linda had the presence of mind to take some deep breaths and reply coolly, “I’m feeling a little uncomfortable. You know, guys, you’re a little into my space. I’m wondering if you could step back a little.”

Linda studied the pavement – and, to her amazement, she saw them take a few steps back. “Thank you,” she said. Then she continued, “Now, I want to hear what you said to me, but to tell you the truth, I’m a little nervous about that knife. I’m wondering if you could put it away.”

After what seemed an eternity of silence and uncertainty, the knife went back into a pocket.

Quietly reaching into her purse, Linda took out a 1,000/= shilling note, caught the eye of the one with the knife, and asked, “who should I give it to?”

“Me,” he said.

Glancing at the other two, she asked if they agreed. One of the two nodded.

“Great,” she said, handing the leader the 1,000/= shilling note. “Now here is what’s going to happen. I’m going to stay right here while you walk away.”

With puzzled looks on their faces, the boys started to walk away, glancing over their shoulders at Linda – and then they broke into a run. They were running from her.

(Adapted from *Working with Emotional Intelligence* by Daniel Goleman. London: Bantam Books, 1999)

- (i) From the passage, it is evident that Linda has excellent negotiation skills. Identify **four** of these skills. (4 marks)
- (ii) Why would we describe this encounter as a win-win situation? Explain your answer. (3 marks)
- (iii) Describe the rhythm of the last paragraph of this passage. (2 marks)

(b) Read the poem below and then answer the questions that follow:

**Reprise**

Geniuses of countless nations  
Have told their love for generations  
Till all their memorable phrases  
Are common as goldenrod or daisies.  
Their girls have glimmered like the moon,  
Or shimmered like a summer noon,  
Stood like lily, fled like fawn,  
Now the sunset, now the dawn,  
Here the princess in the tower  
There the sweet forbidden flower.  
Darling, when I look at you  
Every aged phrase is new  
And there are moments when it seems  
I've married one of Shakespeare's dreams.

By Ogden Nash in Literature.  
Boston: McDougal Littell, 2008.

- (i) Describe the rhyme scheme in this poem and say what it does. (4 marks)
- (ii) Identify and illustrate any **two** instances of alliteration in the poem. (2 marks)
- (iii) Explain how you would perform the last four lines. (3 marks)

(c) Examine the sets of words below and on the basis of the pronunciation of the vowel sounds that have been highlighted, pick the odd one out.

- |   |  |
|---|--|
| (i) <b>leopard</b><br><b>jeopardy</b> .....<br><b>deodorant</b> | (iv) <b>neither</b><br><b>either</b> .....<br><b>neighbour</b> |
| (ii) <b>audience</b><br><b>haunt</b> .....<br><b>loud</b>       | (v) <b>gone</b><br><b>tone</b> .....<br><b>bone</b>            |
| (iii) <b>said</b><br><b>paid</b> .....<br><b>laid</b>           | (vi) <b>food</b><br><b>fool</b> .....<br><b>book</b>           |

(6 marks)

- (d) On your way home from school, you meet a lady who tells you that she is new in the neighbourhood. She requests you to give her directions to the nearest police station. How would you ensure that the directions you give enable her to reach her destination? (6 marks)

### 3.1.2 English Paper 2 (101/2)

1 Read the passage below and then answer the questions that follow. (20 marks)

Most people believe that when someone is lying they smile more than usual, but research shows the opposite is true – they smile less. The difficulty with lying is that the subconscious mind acts automatically and independently of our verbal lie, so our body language gives us away. This is why people who rarely tell lies are usually caught, regardless of how convincing they may sound. The moment they begin to lie, their body sends out contradictory signals, and these give us a feeling that they're not telling the truth. During the lie, the subconscious mind sends out nervous energy which appears as a gesture that can contradict what was said.

Professional liars, have refined their body gestures to the point where it is difficult to “see” the lie, and people **fall for it, hook, line, and sinker**. They do it in one of the two ways. First, they practise what “feel” like the right gestures when they tell the lie, but this only works when they have practised telling a lot of lies over long periods of time. Second, they can reduce their gesturing so that they don't use any positive or negative gestures while lying, but that's also hard to do.

Try this simple test – tell a deliberate lie to someone face-to-face and make a conscious effort to suppress all body gestures. Even when your major body gestures are consciously suppressed, numerous small micro-gestures will still be transmitted. These include facial muscular twitching, dilation and contraction of pupils, sweating, flushed cheeks, eye-blinking rate increasing from 10 blinks per minute to as many as 50 blinks per minute, and many other micro-signals that indicate deceit. Research using slow-motion cameras shows that these micro-gestures can occur within a split second and it's only people such as professional interviewers, salespeople, and the very **perceptive** who can read them.

It's obvious then that to be able to lie successfully you need to have your body hidden or out of sight. Police interrogation often involves placing the person on a chair in the open or placing him under lights with his body in full view of the interrogators; his lies are much easier to see under these circumstances. Lying is easier if you're sitting behind a desk where your body is partially hidden, or if you're peering over a fence, or from behind a closed door. The best way to lie is over the telephone or in an email.

(Adapted from *Body Language* by Allan and Barbara Pease. London: Orion, 2004)

- (a) According to the passage, what is the connection between lying and smiling?(2 marks)
- (b) According to the passage, how do professional liars manage to hide their deception? (4 marks)
- (c) The passage suggests a simple test which involves telling a deliberate lie and consciously suppressing all body gestures. What are the results? (2 marks)
- (d) Explain how police interrogators use their knowledge of how body language relates to spoken language. (2 marks)
- (e) **Make notes** on the relationship between lying and our body language as revealed in the passage. (5 marks)

- (f) How can we tell that the authors of this passage do not approve of lying? (2 marks)
- (g) “The subconscious mind sends out nervous energy.” Rewrite beginning: Nervous ... (1 mark)
- (h) Explain the meaning of each of the following as used in the passage:
- (i) fall for it, hook, line and sinker; (1 mark)
- (ii) perceptive. (1 mark)

2 Read the excerpt below and then answer the questions that follow. (25 marks)

*There is a knocking at the door. The women don't answer. Enter IRONSHIRTS. The PEASANT WOMAN bows low.*

CORPORAL: Well, here she is. What did I tell you? What a nose I have! I smelt her. Lady, I have a question for you. Why did you run away? What did you think I would do to you? I'll bet it was something unchaste. Confess!

GRUSHA: (*While the PEASANT WOMAN bows again and again*): I'd left some milk on the stove, and I suddenly remembered it.

CORPORAL: Or maybe you imagined I looked at you unchastely? Like there could be something between us? A carnal glance, know what I mean?

GRUSHA: I didn't see it.

CORPORAL: But it's possible, huh? You admit that much. After all, I might be a pig. I'll be frank with you: I could think of all sorts of things if we were alone. (*To the PEASANT WOMAN*): Shouldn't you be busy in the yard? Feeding the hens?

PEASANT WOMAN: (*falling suddenly to her knees*): Soldier, I didn't know a thing about it. Please don't burn the roof over our heads.

CORPORAL: What are you talking about?

PEASANT WOMAN: I had nothing to do with it. She left it on my doorstep, I swear it.

CORPORAL: (*Suddenly seeing the CHILD and whistling*): Ah, so there's a little something in the crib! Blockhead, I smell a thousand piasters. Take the old girl outside and hold on to her. It looks like I have a little cross-examining to do. (*The PEASANT WOMAN lets herself be led out by the PRIVATE, without a word.*) So, you've got the child I wanted from you! (*He walks towards the crib.*)

GRUSHA: Officer, he's mine. He's not the one you're after.

CORPORAL: I'll just take a look. (*He bends over the crib.*)

GRUSHA: *Looks round in despair.*

GRUSHA: He's mine! He's mine!

CORPORAL: Fine linen!

- (a) Briefly describe what happens before the events in this excerpt. (3 marks)
- (b) Explain what the playwright achieves by using dirty humour in this excerpt. (4 marks)
- (c) Identify and describe the dramatic irony in this excerpt. (2 marks)
- (d) What does this excerpt reveal about the character of the peasant woman? .....(4 marks)
- (e) This excerpt shows that Grusha makes two mistakes which she later corrects. What are the mistakes and how does she later correct them? (4 marks)
- (f) Imagine you are the director and are selecting the cast for this scene, what physical features would you look for in the Corporal and Grusha? .....(4 marks)
- (g) Rewrite the following in indirect speech: "I didn't see it", Grusha said. (1 mark)
- (h) Describe what happens immediately after the events presented in this excerpt. .... (3 marks)

3 Read the oral narrative below and then answer the questions that follow:

### The Fox and the Crow

A fox once saw a crow fly off with a piece of cheese in its beak and settle on a branch of a tree. "That's for me, as I am a fox," said Mr. Fox, and he walked up to the foot of the tree.

"Good day, Ms. Crow," he cried. "How well you are looking today: how glossy your feathers; how bright your eye. I feel sure your voice must surpass that of other birds, just as your figure does. Let me hear but one song from you that I may greet you as the Queen of Birds."

The crow lifted up her head and began to caw her best, but the moment she opened her mouth the piece of cheese fell to the ground, only to be snapped up by Mr. Fox. "That will do," said he. "That was all I wanted. In exchange for your cheese I will give you a piece of advice for the future – "Do not trust flatterers!"

(Adapted from *Prentice Hall Literature*,  
Ed. Roger Babusci et al. Englewood Cliffs,  
New Jersey, 1991).

- (a) How would you classify this narrative? Explain your answer. (3 marks)
- (b) Identify and illustrate any **two** character traits of the Crow. (4 marks)
- (c) What does the fox mean by “That’s for me, as I am a fox”?. (2 marks)
- (d) Identify and illustrate any **three** stylistic features in this story. (6 marks)
- (e) Explain what this story reveals about human relationships. (4 marks)
- (f) Explain the meaning of the word ‘caw’ as used in the story. (1 mark)

4 (a) *Rewrite the following sentences according to the instructions given after each. Do not change the meaning.* (4 marks)

- (i) It was not necessary for you to leave that early.  
(Begin: You need ...)
- (ii) Is it that difficult to **understand** what the speaker is saying? (Replace the underlined word with an appropriate phrasal verb.)
- (iii) She won the admiration of the judges and was awarded the coveted trophy.  
(Begin: Not only ...)
- (iv) I will give you the money if you tell me the truth.  
(Begin: Only if ...)

(b) *Choose the correct pronoun for each gap from among the following: him, I, me, his, she, hers.* (3 marks)

- (i) The principal has summoned all the students except you and .....
- (ii) Although Joseph and I disagreed over the matter, I am still a friend of .....
- (iii) ..... and I were the only ones who completed the race.

- (c) *Fill in each blank space with the correct alternative from the given choices. (3 marks)*
- (i) The bodyguard stands ..... the president in public meetings.  
(besides/beside)
  - (ii) The childless couple ..... a child. (adapted/adopted)
  - (iii) Many workers did not realize that the strike would lead to .....  
problems. (this/these)
- (d) *Fill in the blank spaces with the correct form of the word in brackets. (3 marks)*
- (i) A nurse ought to be ..... (respond) to the needs of the patients.
  - (ii) The substance will ..... (solid) if exposed to cold air for a few  
minutes.
  - (iii) Such negative ..... (utter) may put you in serious trouble.
- (e) *Rewrite the following sentences putting the word in brackets in the most appropriate  
position. (2 marks)*
- (i) The tourists have been stopping here every month. (briefly)
  - (ii) I have wondered where the treasure is hidden. (often)

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### 3.1.3 English Paper 3 (101/3)

Answer **three** questions only.

#### 1 Imaginative Composition (Compulsory) (20 marks)

Either

- (a) Write a story to illustrate the saying:  
“You reap what you sow.”

Or

- (b) Write a composition explaining what should be done to reduce indiscipline in schools.

#### 2 The Compulsory Set Text (20 marks)

“If we fail to be contented with who we are and what we have, we could end up leading miserable lives.” Drawing examples from the lives of Otieno Kembo and Becky, write an essay illustrating the truth of this statement.

#### 3 The Optional Set Texts (20 marks)

Answer any **one** of the following three questions.

Either

(a) **The Short Story**

Emilia Ilieva and Waveney Olembo (Eds.), *When the Sun Goes Down and Other Stories from Africa and Beyond*

Using illustrations from Kenani’s short story, “*The Retraction*”, write a composition describing the steps we should take when our actions cause others to suffer.

Or

(b) **Drama**

Francis Imbuga, *Betrayal in the City*

Drawing examples from Francis Imbuga’s *Betrayal in the City*, write a composition on the role played by relatives in one’s life.

Or

(c) **The Novel**

Witi Ihimaera, *The Whale Rider*

“Although we are most secure at home, visiting other countries deepens our understanding of the world.” Referring closely to the story of Rawiri, write an essay in support of this statement.

## 3.2 KISWAHILI (102)

### 3.2.1 Kiswahili Paper 1 (102/1)

#### 1 Lazima

Wewe ni katibu wa jopokazi lililoteuliwa kuchunguza vyanzo vya ongezeko la visa vya wanafunzi katika eneo la Telekeza kuacha shule kabla ya kukamilisha masomo yao. Andika ripoti ya uchunguzi huo.

2 Andika insha kuhusu umuhimu wa tamasha za muziki katika maisha ya vijana.

3 Tunga kisa kitakachodhihirisha maana ya methali ifuatayo:

Usipoziba ufa utajenga ukuta.

4 Tunga kisa kinachoanza kwa maneno yafuatayo:

Nilimtazama kwa muda. Macho yake yalijaa machozi ya furaha na majonzi...

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### 3.2.2 Kiswahili Paper 2 (102/2)

#### 1 UFAHAMU: (Alama 15)

*Soma kifungu kifuatacho kisha ujibu maswali.*

Siku moja nilifika kumwona babu yangu kule kwetu kijijini bila kumtolea taarifa mbele. Nilipofika nilimkuta amevaa magwanda yake yaliyokula chumvi hadi yakakinai. Alinitazama huku akitabasamu akisema, “Tabia hii ya kuja kwako bila taarifa utaikoma. Ukiendelea hivi utakuja **kwenda kwa wakwe wako upate ndio wanakwenda uchi.**”

Kauli hii ya babu ilinifanya kucheka. Tulisalimiana huku tunapigana pambaja. Harufu ya manukato niliyojirashia asubuhi hiyo ilikutana na kuchanganyika na harufu ya jasho lake. Baadaye tuliingia ndani, tukaketi kwenye makochi yaliyokuwa yameanza kuonyesha dalili za kuchoka. Baada ya kuulizana habari za kimsingi nilitaka kujua alipokuwa nyanya.

“Nyanyako ameenda kumwona jirani yetu mgonjwa. Amepata ajali akitoka mjini alikokuwa ameenda kuwatembelea wajukuu wake. Raha yote ya kuwaona iligeuka karaha.” Alinyamaza kidogo, akaguna, kisha akaendelea, “Barabara hizi, sijui mwaziita ‘haibei’, zimewala watu wetu. Huwezi kuwahesabia vidole tena.”

Kwa muda nilikosa la kusema. Niliona niubadili mkondo wa mazungumzo. Nilianza kwa kumweleza kuwa mazingira ya kijijini yalipendeza. Kwa kweli mandhari yale ya kijani kote hadi upeo wa macho yalinisisimua sana. Sauti za ndege zilikuwa mfano wa muziki wa chini uliochezwa ili kuyapamba mazungumzo yetu. Mara mojamoja nilitekwa na sarakasi ya jogoo aliyetanua mabawa yake na kukaribia kuzungumza, utadhani ni sauti ya mwanadamu. Nilipokuwa ninamtazama yule jogoo, nilishtukia mkono wa babu ukiushika wangu, akaniongoza nje akisema, “Haina haja kuyamezameza mate. Huyu jogoo ni wako. Leo tutamfanya kitoweo kwa ajili yako. Najua kule mjini mnakula kuku wa miigizo tu. Faida yao kwa mwili ni duni.”

Tulishirikiana kumkamata yule jogoo lakini baada ya muda nilichoka. Moyo wangu ulikuwa unapiga kwa nguvu ajabu. **Niliona kisunzi**, nikakaa. Nikiwa ninajipumzisha chini ya kivuli cha mpera nilisikia sauti za watoto waliokuwa wamejiunga na babu kumkamata yule jogoo.

Tukiwa tunasubiri chakula cha mchana, niliona hii kuwa fursa mufti kumweleza babu kwamba nilifika kusudi niende naye mjini. Nilipolitamka tu hili alicheka sana. Aliniambia, “Mji ni wenu nyinyi. Sisi watu wa shamba raha yetu ni kufukuzana na kazi hizi za sulubu. Kwenda kukaa mjini na nguvu zote hizi faida yake nini? Nasikia siku hizi huko mjini kuna misongamano ya magari isiyoisha. Kuna haja gani kwenda kushinda kwenye gari kuharibu muda wako kwa sababu ya msongamano? Mimi hapa kwangu nikitaka kwenda kuzitekeleza shughuli zangu sipati kizuizi. Ninakwenda tu.”

“Sikiliza babu,” nilimwambia, “mji una raha yake. Wingi wa magari ni ishara ya maendeleo. Uwezo wa kifedha wa watu uko juu kuliko wa hapa kijijini. Leo hii mtu akipatwa na dharura ya ugonjwa hapa, kijiji kitafanya takilifu kumfikisha hospitalini. Mjini usafiri upo kila mahali wakati wowote.”

“Kule mjini mnadai kuona mwanga na kuujua ustaarabu ila mmenoa,” alisema babu, “maisha yenu, afadhali ndege warukao angani. Ni kama mnachupa kutoka upande mmoja hadi mwingine, kana kwamba mnaendeshwa kwa nguvu za mtambo usioonekana. Jamaa hawajuani tena. Mizizi yenu hamuitambui. Mmekuwa mithili ya miti inayopendeza lakini isiyo na mizizi ya kutosha. Upepo hafifu uvumapo inalemewa na kujibwaga chini. Je, huo ndio ustaarabu? Ustaarabu kwetu sisi watu wa hapa kijijini ni mtu kuwaamkua wenzake kila kukicha. Ni kujuliana hali. Ni kuombana kibaba cha unga au kibakuli cha mboga. Tunaishi tukijuana, si majina na sura tu, bali pia hata upishi wetu. Nyinyi mnaishi pasi na kujua majirani wenu. Je, wewe hukuona hata kuku wangu hawa wanatangamana?”

Swali hili lilipoachiliwa nilihisi kama aliyetwikwa nanga. Kijasho chembamba kilinitoka. Kwa bahati nzuri meza ilikuwa imeisha kuandaliwa; kipindi cha kupambana mezani kikawadia. Nilipokuwa nikila nilitambua kitu kimoja; yule kuku alikuwa na ladha ya kupendeza, tofauti na tuliozoea kuwala kule mjini. Ila nililoliona tu ni kuwa alikuwa mgumu kidogo. Nilipokuwa nikilifikiria hili niliisikia sauti ya babu tena.

“Chunga asikung’oe meno. Huyu ni kuku hasa. Atakusaidia kuimarisha meno. Hutakuwa na haja ya kwenda kumwona daktari wa meno. Sisi hapa hata kushiriki chakula kunatukumbusha kuwa kila shughuli ni kazi tosha. Hatuna muda wa kulaza damu.” Alichukua bilauri ya maji, akapiga tama, kisha akaendelea kuinyofoa sima yake ya bada.

- (a) Huku ukirejelea kifungu, fafana faida **sita** utakazopata ukiishi shamba. (alama 6)
- (b) Eleza mtazamo wa wahusika wafuatao kuhusu mji:
- (i) msimulizi (alama 3)
- (ii) babu (alama 4)
- (c) Andika maana ya fungu lifuatalo la maneno kwa mujibu wa taarifa: (alama 1)
- kwenda kwa wakwe wako upate ndio wanakwenda uchi
- (d) Andika kisawe cha: (alama 1)
- Niliona kisunzi

*Soma kifungu kifuatacho kisha ujibu maswali.*

Katika ulimwengu huu tunaishi wenye hekaheka nyingi, mwanadamu anaendeshwa na maisha mfano wa gurudumu la gari. Kwa watu wenye kufanya kazi katika mazingira ya ofisi ambapo wanaketi mchana kutwa, mazoezi ni muhimu sana. Baadhi ya watu huona fahari wapigapo tai na kuelekea au kutoka kazini kwa gari. Tabia hii ya mwanadamu inamsahaulisha kuwa mwili wake ulidhamiriwa kufanya mazoezi ya viungo kwa kutembea au kufanya kazi zenye kuhitaji misuli kupashwa moto. Watu wengi hawana habari kuwa mazoezi yana faida tele kwao.

Wataalamu wa sayansi wamebainisha kuwa watu wanaoidhiki miili yao kwa mazoezi ya mara kwa mara huishi zaidi kuliko wasiofanya mazoezi. Watu hawa huwa wamo katika hali nzuri ya afya na wenye nguvu kuliko wale ambao hawaishughulishi miili yao kwa mazoezi au kazi zinazohitaji utumiaji nguvu.

Ni dhahiri kwamba mazoezi huchochea kuundwa kwa seli mpya za ubongo. Utafiti wa kisayansi umebainisha kuwa sehemu za ubongo zenye kusisimuliwa kwa mazoezi ndizo hutekeleza jukumu la kukumbuka na kujifunza. Bila mazoezi sehemu hizi zitashindwa kukumbuka au kujifunza maarifa mapya. Vile vile, imethibitishwa kwamba watu wanaoshiriki shughuli zenye kuwahitaji kutumia nguvu hutia fora katika mambo yanayowahitaji kukumbuka, kufanya maamuzi, pamoja na kusuluhisha matatizo.

Hali kadhalika, mazoezi huimarisha siha ya binadamu. Mathalani, matatizo ya moyo yanaweza kukabiliwa kwa kufanya mazoezi ya viungo. Kufanya mazoezi mara kwa mara huufanya moyo kuwa imara na kuwezesha kutekeleza jukumu lake ipasavyo. Ifahamike kwamba moyo wenye siha huweza kupiga kiasi kikubwa cha damu bila ya juhudi kubwa. Hili bila shaka litamkinga binadamu dhidi ya kulemewa na kazi.

Isitoshe, kushiriki mazoezi au shughuli zenye kutumia nguvu mara kwa mara huweka mwili katika hali nzuri ya kupambana na magonjwa. Utafiti wa kisayansi umeonyesha kuwa shughuli kiasi zinazomhitaji mtu kutumia nguvu, pamoja na upunguzaji wa uzito, na uzingatiaji wa lishe bora, huweza kupunguza uwezekano wa kupata ugonjwa wa kisukari kwa baina ya asilimia 50 na 60. Mazoezi hayapunguzi tu shinikizo la damu, bali pia hatari ya kupata kiharusi. Aidha, kufanya mazoezi mara kwa mara husaidia kudhibiti uzani wa mwili. Mtu anapokula kiasi cha chakula kinachozidi mahitaji yake ya kimwili huweza kujinenepea na kushindwa kutekeleza majukumu ya kimsingi. Mazoezi husaidia kuzichoma kalori zisizohitajika mwilini. Hatua hii, licha ya kusaidia kupunguza uzani, huvisisimua viungo vya mwili. Matokeo ya haya ni utendakazi wa hali ya juu bila kuchoka. Vilevile mwili unaofanya mazoezi haudorori. Umbo la mtu anayefanya mazoezi hupendeza.

Juu ya hayo, kufanya mazoezi mara kwa mara husaidia kujenga misuli yenye nguvu. Misuli inapokuwa na nguvu tunaweza kulifanya jambo kwa muda mrefu bila kuchoka. Mbali

na misuli kuimarika, mazoezi na shughuli zinazohitaji utumiaji nguvu husukuma hewa na virutubisho kwenye viungo mahususi vya mwili na kuvisaidia kufanya kazi vyema zaidi.

Hali kadhalika, mazoezi husaidia kujenga mifupa. Kadiri binadamu anavyoshiriki katika shughuli kama vile kuruka, ndivyo anavyoimarisha mifupa yake. Shughuli ya aina hii huipa mifupa uzito ambao unaiwezesha kukua na kujengeka ikiwa na nguvu. Mazoezi pia hukawiza kudhoofika kwa mifupa.

Kunyooshanyoosha viungo nako huchangia kuufanya mwili kuwa imara na wenye kunyumbuka. Hali hii ya mwili hupunguza uwezekano wa kupata majeraha. Mwili usionyumbuka humfanya mtu ashindwe kutekeleza hata shughuli nyepesi zinazomhitaji kutumia nguvu. Si ibra kupata kwamba kuitekeleza shughuli ndogo tu humfanya mtu kupata maumivu.

Utulivu wa akili nao huweza kupatikana kwa kufanya mazoezi. Imebainishwa kwamba kufanya mazoezi kwa angalau dakika thelathini kwa muda wa baina ya siku tatu na tano kwa wiki hupunguza kwa kiasi kikubwa, dalili za unyong'onyevu. Na je, wajua kwamba kufanya mazoezi husaidia kupata usingizi? Mazoezi ni mfano wa bembea inayokutuliza na kukupa usingizi.

Mke ni nguo, mgomba kupaliliwa. Nao mwili wa binadamu, kama mgomba, unahitaji kushirikishwa katika mazoezi ili kuuwezesha kuwa na hamu ya kutenda kazi.

- (a) Kwa kurejelea aya **tano** za kwanza, eleza matatizo ya kiafya yanayoweza kupatikana kwa kutofanya mazoezi. (maneno 100) (alama 9, 1 ya mtiririko)

Matayarisho

Nakala Safi

- (b) Fupisha ujumbe wa aya **tano** za mwisho kwa maneno 80. (alama 6, 1 ya mtiririko)

Matayarisho

Nakala Safi

### 3 MATUMIZI YA LUGHA: (Alama 40)

- (a) Andika sauti zenye sifa zifuatazo: (alama 2)
- (i) nazali ya kaaka laini .....
  - (ii) kikwamizo ghuna cha mdomo na meno .....
  - (iii) irabu ya nyuma, wastani .....
  - (iv) kiyeyusho cha kaaka gumu .....
- (b) Bainisha silabi katika neno: wanyweshavyo. (alama 1)

- (c) Andika upya sentensi ifuatayo kwa kubadilisha nomino zilizopigiwa mstari kuwa vitenzi.  
Wafanyakazi wote watafanyiwa tathmini ili kupata suluhu ya matatizo hayo. (alama 2)
- (d) Andika sentensi ifuatayo katika umoja.  
Mkihifadhi nafaka hizo vizuri maeneo haya yatakuwa na vyakula vya kutosha. (alama 2)
- (e) Andika neno **moja** lenye mofimu zifuatazo: (alama 2)  
nafsi ya kwanza wingi, wakati uliopita, yambwa, mzizi, kauli tendesha, kauli tenda
- (f) Tunga sentensi kuonyesha matumizi yafuatayo ya neno: kama (alama 2)  
(i) kiunganishi  
(ii) kihusishi
- (g) Tunga sentensi yenye kishazi kirejeshi ambacho ni kivumishi. (alama 2)
- (h) Andika sentensi ifuatayo katika hali ya ukubwa.  
Nyumba hizo zilijengwa mbali na mji ule. (alama 1)
- (i) Tunga sentensi yenye muundo ufuatao: (alama 2)  
nomino ya jamii, kirai kihusishi, kitenzi kishirikishi, kielezi cha mahali
- (j) Andika sentensi ifuatayo kulingana na maagizo. (alama 1)  
Chakula kinachozalishwa kwa njia za kiasili kina viinilishe vingi.  
Anza kwa: Viinilishe vingi
- (k) Tumia viwakilishi badala ya nomino zilizopigiwa mstari.  
Mtalii atazuru mbuga. (alama 1)
- (l) Akifisha sentensi ifuatayo:  
basi mwanangu akasema daudi hivyo ndivyo tunavyoweza kufikia vision 2030 wewe waonaje (alama 3)
- (m) Unganisha sentensi zifuatazo kwa kutumia kiunganishi cha wakati.  
Beti alijishindia tuzo. Beti alishiriki katika utunzaji wa mazingira. (alama 1)
- (n) Tumia 'kwa' katika sentensi kuonyesha: (alama 2)  
(i) sababu  
(ii) pamoja na

- (o) Changanua sentensi ifuatayo kwa kielelezo cha matawi.  
Mvua ilinyesha tulipokuwa tukilima. (alama 3)
- (p) Andika sentensi ifuatayo katika kauli ya kutendewa.  
Malik alipuliza siwa akiwa kwa Shaka. (alama 2)
- (q) Onyesha matumizi ya **ka** katika sentensi ifuatayo:  
Mumbi alitia embe kapuni likaiva. (alama 1)
- (r) Andika sentensi ifuatayo katika hali ya mazoea.  
Mmomonyoko wa udongo ulipozuiliwa mashamba yalinawiri. (alama 2)
- (s) Tunga sentensi **moja** kutofautisha maana ya **vito na fito**. (alama 2)
- (t) Methali: Mzigo wa mwenzio ni kanda la usufi, huambiwa mtu anayezidharau shida za wengine. Mtu asiyetambua kuwa kuna wengine wanaoweza kulimudu jambo kuliko yeye huambiwa methali gani? (alama 1)
- (u) Bainisha kiima na chagizo katika sentensi ifuatayo:  
Mwenyewe alikipenda kwa dhati. (alama 1)
- (v) Tunatumia kihisishi “makiwa” tunapotaka kumtuliza aliyefiwa, na ..... tunapotaka mtu atupishe. (alama 1)
- (w) Tunga sentensi ya masharti inayoonyesha kwamba tendo lilifanikiwa kwa sababu ya kufanikiwa kwa tendo lingine. (alama 1)
- (x) Andika nahau inayojumuisha ujumbe ufuatao:  
kumzuia mtu kupata kitu japo huna haja nacho (alama 1)
- (y) Shumbi ni kwa udongo, ..... kwa chumvi, na ..... kwa mtama. (alama 1)

**4 ISIMUJAMII:** (Alama 10)

*Soma makala yafuatayo kisha ujibu maswali.*

Mtu I: Wewe njoo hapa! (*Kwa sauti kubwa.*) Fanya upesi!

Mtu II: (*Anakimbia mbio.*) Naja Sir.

Mtu I: (*Anamtazama.*) Unajifanya mwerevu?

Mtu II: Hapana Sir ... eh ... afande.



Mtu I: Jina?

Mtu II: Samwel Kibao

Mtu I: (*Huku anaandika.*) Lete kitambulisho.

Mtu II: Sina hapa *Sir*.

Mtu I: Huna kitambulisho? Utafanyiwa *booking* vipi?

Mtu II: Naomba ...

Mtu I: Naomba! Naomba! Unaomba nini? Wazururaji kama nyinyi tunawajua. Mnajidai hamjui kuna *curfew*. Mnajiponza wenyewe na kuwahasiri wenzenu. Kisha, “Serikali saidia”. Usiniharibie muda wangu. (*Akiashiria.*)  
Ingia ndani! Utakuwa mgeni wetu leo. Tutakukirimu chakula na chumba. (*Anamsukuma ndani.*)

(a) Bainisha sajili ya makala haya.

(alama 2)

(b) Eleza sifa **nane** za sajili hii kwa kurejelea makala haya.

(alama 8)

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### 3.2.3 Kiswahili Paper 3 (102/3)

#### SEHEMU A : FASIHI SIMULIZI

##### 1 Lazima

(a) *Soma utungo ufuatao kisha ujibu maswali.*

Hadithi ya Jabari inasimuliwa na jamii nyingi. Jabari alizaliwa kashika mkuki mkononi. Mawio ambayo kilio chake, ambacho kwa kweli kilikuwa mngurumo, kilipopasua anga, nyota kubwa ilianguka kutoka mbinguni. Ulimwengu mzima ulitetemeka na kutwaa giza.

Hata kabla mama mtu hajampa ziwa, Jabari alikuwa amevuvumuka na kuwa ghulamu wa miraba minne. Haikuchukua muda, hata vita kati ya jamii ya Sule na Suna vikaanza; kikosi cha Sule cha wapiganaji mia moja kikawajia vijana wa Suna kwa sime na nyuta. Jabari aliwakabili kwa konde moja pekee, akakirambisha dongo kita kizima.

- (i) Bainisha kipera cha utungo huu. (alama 1)
- (ii) Toa sababu **mbili** kuthibitisha jibu lako la (i) hapa juu. (alama 1)
- (iii) Eleza manufaa **sita** ambayo jamii itapata kwa kukirithisha kipera hiki kwa vizazi vijavyo. (alama 6)

(b) *Soma utungo ufuatao kisha ujibu maswali.*

Ndimi Mwimo mdumishaji ukoo  
Ndimi ndovu mtetemesha ardhi  
Aliyepigana vita, ukoo kuauni  
Ziliporindima zangu nyayo  
adui alinywea, mafahali na mitamba akatukabidhi  
Kwenye misitu sikuwa na kifani  
Paa na hata visungura  
vilijikabidhi kwangu  
kwa kuinusa tu mata  
Nani aliyewahi  
ngomani kunipiku?  
Makoo hawakunisifu, wakarilia nikaha?  
Kwenye nyanja za michuano  
nani angethubutu, ndaro kunipigia?  
Sikuwabwaga chini, kwa yangu maozi, hata kabla hatujavaana?

- (i) Andika aina ya sifo hii. (alama 1)

- (ii) Bainisha shughuli **mbili** za kiuchumi na **mbili** za kijamii zinazoendelezwa na jamii inayosawiriwa na utungo huu. (alama 2)
- (iii) Eleza mambo **matano** ambayo yanaweza kuzingatiwa ili kufanikisha uwasilishaji wa utungo huu. (alama 5)
- (c) Eleza faida **nne** za matumizi ya nyimbo katika uwasilishaji wa ngano. (alama 4)

## SEHEMU B: RIWAYA

### K. Walibora: *Kidagaa Kimemwozea*

*Jibu swali la 2 au la 3.*

- 2 “Moyo ulimpapa na kijasho chembamba kumtekenya juu ya mwazi wa pua. Akahisi uchungu wa mwiba wa kujidunga.”
- (a) Eleza muktadha wa dondoo hili. (alama 4)
- (b) Huku ukirejelea riwaya hii, fafanua kwa kutoa hoja **nane**, namna anayelengwa na kauli hii alivyojidunga miiba. (alama 16)
- 3 (a) “Imani ni kielelezo cha vijana waliowajibika.” Thibitisha kauli hii kwa kurejelea mifano **kumi** kutoka *Kidagaa Kimemwozea*. (alama 10)
- (b) “Nadhani Mzungu pale alipo hana budi kutambua ukomavu wa Mwafrika katika kila sekta ya maisha.” Onyesha kinyume katika kauli iliyopigiwa mstari kwa kurejelea uongozi wa Tomoko. (alama 10)

## SEHEMU C: TAMTHILIA

### T. Arege: *Mstahiki Meya*

*Jibu swali la 4 au la 5.*

- 4 “Kushindana naye ni kama kushindana na ndovu. Utapasuka.”
- (a) (i) Eleza muktadha wa dondoo hili. (alama 4)
- (ii) Bainisha tamathali **moja** ya usemi inayojitokeza katika dondoo hili. (alama 2)
- (b) Kwa kurejelea hoja **saba**, thibitisha kwamba kushindana na anayerejelewa na kauli hii ni sawa na kushindana na ndovu. (alama 14)
- 5 “Wahenga wanasema dawa ya adui ni kummegea unachokula.”
- (a) (i) Andika suala linalodokezwa na kauli iliyopigiwa mstari. (alama 2)

- (ii) Jadili hoja **nane** zinazoonyesha namna suala hili linavyozorotesha hali ya maisha Cheneo. (alama 8)
- (b) Jadili jinsi vyombo vya usalama vilivyotumiwa kuuendeleza uongozi wa Cheneo. (alama 10)

### SEHEMU D: USHAIRI

*Jibu swali la 6 au la 7.*

6 *Soma shairi lifuatalo kisha ujibu maswali.*

Daima alfajiri na mapema  
Hunipitia na jembe na kotama  
Katika njia iendayo kondeni  
Kama walivyofanya babuze zamani;  
Nimuonapo huwa anatabasamu  
Kama mtu aliye na kubwa hamu  
Kushika mpini na kutokwa jasho  
Ili kujikimu kupata malisho.

Anapotembea anasikiliza  
Videge vya anga vinavyotumbuiza  
Utadhani huwa vimemngojea  
Kwa usiku kucha kuja kumwimbia;  
Pia pepo baridi kumpepea  
Rihi ya maua zikimletea  
Nao umande kumbusu miguu;  
Na miti yote hujipinda migongo  
kumpapasa, kumtoa matongo;  
Na yeye kuendelea kwa furaha  
kuliko yeyote ninayemjua  
Akichekelea ha ha ha ha ha ...

Na mimi kubaki kujiuliza  
Kuna siri gani inayomliwaza?  
Au ni kujua au kutojua?  
Furaha ya mtu ni furaha gani  
katika dunia inayomhini?  
Ukali wa jua wamnyima zao  
Soko la dunia lamkaba koo;  
Dini za kudhani zamsonga roho  
Ayalimia matumbo ya waroho;  
Kuna jambo gani linamridhisha?  
Kama si kujua ni kutokujua  
Laiti angalijua, laiti angalijua!

(T. Arege)

- (a) Eleza hali ya mzungumziwa katika shairi hili. (alama 4)
- (b) Huku ukitoa mifano, onyesha aina **mbili** za uhuru wa kishairi uliotumiwa katika shairi hili. (alama 2)
- (c) Fafanua aina **tatu** za taswira ukirejelea ubeti wa pili. (alama 3)
- (d) Eleza umuhimu wa maswali ya balagha katika shairi hili. (alama 2)
- (e) Bainisha vipengele vifuatavyo vya kimtindo katika shairi hili: (alama 3)
- (i) tashhisi
- (ii) kinaya
- (iii) tashbihi
- (f) Eleza toni ya shairi hili. (alama 2)
- (g) Bainisha nafsineni katika shairi hili. (alama 1)
- (h) Changanua muundo wa shairi hili. (alama 3)

7 Soma Shairi lifuatalo kisha ujibu maswali.

**T. Arege: Mwili**

Leo kitaka nifike, natamani, ila wauma mwili  
Kwa kazi nihusike, samahani, unahiliki mwili  
Napenda nihesabike, makundini, ila huwezi mwili.

Vitisho pamwe kelele, ninavicha, kwa nafsi na mwili  
Ila ugonjwa utimile, umechacha, na kuudhili mwili  
Msikose simile, magalacha, si gurudumu mwili.

Vingekuwepo viraka, kuutia, ngeushuruti mwili  
Kifundi kivipachika, kuingia, hata kuridhi mwili  
Upya ukaungilika, kuvutia, roho na wake mwili.

Lakini kamwe haiwi, kuvipata, vipande vyake mwili  
Sihofu kupata mawi, sitajuta, kupigania mwili  
Hata kufutwa sikawi, nitakita, kidete nao mwili.

Kazi ninaithamini, ni hakika, akilini na mwili  
Ila kamwe siamini, kusagika, damu, jasho na mwili  
Uwele hususani, kioneka, nguvu hitishi mwili.

- (a) Eleza dhamira ya mtunzi wa shairi hili. (alama 4)

- (b) Fafanua mbinu **nne** za lugha zilizotumiwa katika shairi hili. (alama 8)
- (c) Eleza toni ya shairi hili. (alama 2)
- (d) Ni nani anayezungumziwa na nafsini katika shairi hili? (alama 1)
- (e) Eleza bahari ya shairi hili kwa kurejelea vipande. (alama 2)
- (f) Andika ubeti wa mwisho kwa lugha ya nathari. (alama 3)

### SEHEMU E: HADITHI FUPI

**K. Walibora na S. A. Mohamed (Wah) :** *Damu Nyeusi na Hadithi Nyingine*

“Mizizi na Matawi” (A. Abdulla Ali)

- 8 (a) “Mwisho, naomba sote tusameheane kwa dhati.”
- (i) Fafanua muktadha wa dondoo hili. (alama 4)
- (ii) Jadili umuhimu wa hotuba ya mzungumzaji katika hadithi hii. (alama 8)
- (b) Onyesha jinsi hadithi, “Mke wangu” ilivyotumia kinaya kufanikisha ujumbe wake. (alama 8)

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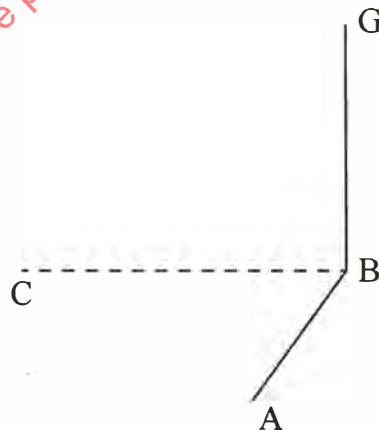
### 3.3 MATHEMATICS ALTERNATIVE A (121)

#### 3.3.1 Mathematics Alt.A Paper 1 (121/1)

#### SECTION I (50 marks)

Answer *all* the questions in this section in the spaces provided.

- 1 (a) Evaluate  $540\,396 - 726\,450 \div 3$ . (1 mark)
- (b) Write the total value of the digit in the thousands place of the results obtained in (a) above. (1 mark)
- 2 Muya had a  $6\frac{2}{3}$  ha piece of land. He donated  $\frac{7}{8}$  ha to a school and  $1\frac{1}{2}$  ha to a children's home. The rest of the land was shared equally between his son and daughter. Find the size of land that each child got. (3 marks)
- 3 The volume of a cube is  $1\,728\text{ cm}^3$ . Calculate, correct to 2 decimal places, the length of the diagonal of a face of the cube. (3 marks)
- 4 Use logarithms, correct to 4 significant figures, to evaluate  $\sqrt{\frac{72.56 \times 0.64}{(1.845)^2}}$  (4 marks)
- 5 A piece of wire is bent into the shape of an isosceles triangle. The base angles are each  $48^\circ$  and the perpendicular height to the base is 6 cm. Calculate, correct to one decimal place, the length of the wire. (3 marks)
- 6 The density of a substance A is given as  $13.6\text{ g/cm}^3$  and that of a substance B as  $11.3\text{ g/cm}^3$ . Determine, correct to one decimal place, the volume of B that would have the same mass as  $50\text{ cm}^3$  of A. (3 marks)
- 7 Below is part of a sketch of a solid cuboid ABCDEFGH. Complete the sketch. (2 marks)



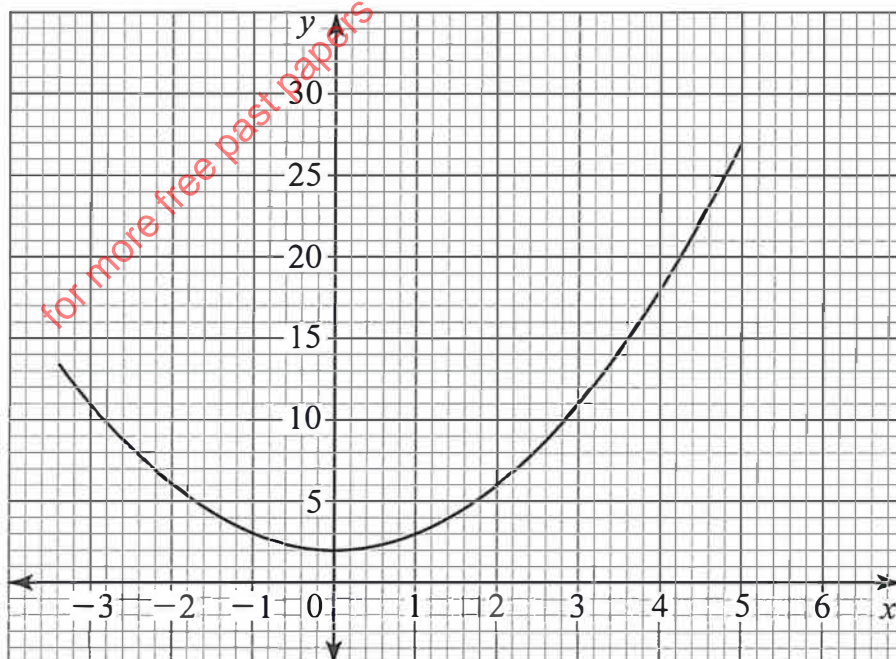
- 8 A salesman is paid a salary of Ksh 15 375 per month. He also gets a commission of  $4\frac{1}{2}\%$  on the amount of money he makes from his sales. In a certain month, he earned a total of Ksh 28 875. Calculate the value of his sales that month. (3 marks)

- 9 The sum of interior angles of a regular polygon is 24 times the size of the exterior angle.
- (a) Find the number of sides of the polygon. (3 marks)
- (b) Name the polygon. (1 mark)
- 10 The marks scored by a group of students in a test were recorded as shown in the table below.

Marks	30–34	35–39	40–44	45–49	50–54	55–59	60–64
No. of Students	3	6	5	12	8	9	7

On the grid provided, and on the same axes, represent the above data using:

- (a) a histogram; (3 marks)
- (b) a frequency polygon. (1 mark)
- 11 Given that  $\mathbf{P} = 5\mathbf{a} - 2\mathbf{b}$  where  $\mathbf{a} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$  and  $\mathbf{b} = \begin{pmatrix} 4 \\ 1 \end{pmatrix}$ . Find:
- (a) column vector  $\mathbf{P}$ ; (2 marks)
- (b)  $\mathbf{P}'$ , the image of  $\mathbf{P}$  under a translation vector  $\begin{pmatrix} -6 \\ 4 \end{pmatrix}$ . (1 mark)
- 12 Given that  $a = 3$ ,  $b = 5$  and  $c = -\frac{1}{2}$ , evaluate  $\frac{4a^2 + 2b - 4c}{\frac{1}{4}(b^2 - 3a)}$  (3 marks)
- 13 The figure below represents the curve of an equation.



Use the mid-ordinate rule with 4 ordinates to estimate the area bounded by the curve, lines  $y = 0$ ,  $x = -3$  and  $x = 5$ . (3 marks)



- 14 The cost of 2 jackets and 3 shirts was Ksh 1 800. After the cost of a jacket and that of a shirt were increased by 20%, the cost of 6 jackets and 2 shirts was Ksh 4 800. Calculate the new cost of a jacket and that of a shirt. (4 marks)
- 15 A tailor had a piece of cloth in the shape of a trapezium. The perpendicular distance between the two parallel edges was 30 cm. The lengths of the two parallel edges were 36 cm and 60 cm. The tailor cut off a semi circular piece of the cloth of radius 14 cm from the 60 cm edge. Calculate the area of the remaining piece of cloth. (Take  $\pi = \frac{22}{7}$ ). (3 marks)
- 16 Musa cycled from his home to a school 6km away in 20 minutes. He stopped at the school for 5 minutes before taking a motorbike to a town 40km away. The motorbike travelled at 75 km/h. On the grid provided, draw a distance-time graph to represent Musa's journey. (3 marks)

## SECTION II (50 marks)

*Answer any five questions in this section in the spaces provided.*

- 17 Three partners Amina, Bosire and Karuri contributed a total of Ksh 4 800 000 in the ratio 4:5:7 to buy an 8 hectares piece of land. The partners set aside  $\frac{1}{4}$  of the land for social amenities and sub-divided the rest into 15 m by 25 m plots.
- (a) Find:
- (i) the amount of money contributed by Karuri; (2 marks)
- (ii) the number of plots that were obtained. (3 marks)
- (b) The partners sold the plots at Ksh 50 000 each and spent 30% of the profit realised to pay for administrative costs. They shared the rest of the profit in the ratio of their contributions.
- (i) Calculate the net profit realised. (3 marks)
- (ii) Find the difference in the amount of the profit earned by Amina and Bosire. (2 marks)
- 18 Two shopkeepers, Juma and Wanjiku bought some items from a wholesaler. Juma bought 18 loaves of bread, 40 packets of milk and 5 bars of soap while Wanjiku bought 15 loaves of bread, 30 packets of milk and 6 bars of soap. The prices of a loaf of bread, a packet of milk and a bar of soap were Ksh 45, Ksh 50 and Ksh 150 respectively.
- (a) Represent:
- (i) the number of items bought by Juma and Wanjiku using a  $2 \times 3$  matrix. (1 mark)
- (ii) the prices of the items bought using a  $3 \times 1$  matrix. (1 mark)
- (b) Use the matrices in (a) above to determine the total expenditure incurred by each person and hence the difference in their expenditure. (3 marks)

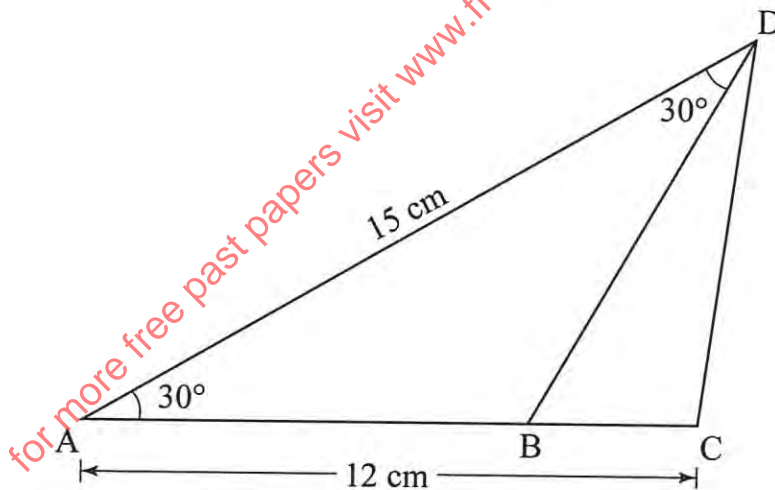
- (c) Juma and Wanjiku also bought rice and sugar. Juma bought 36 kg of rice and 23 kg of sugar and paid Ksh 8 160. Wanjiku bought 50 kg of rice and 32 kg of sugar and paid Ksh 11 340. Use the matrix method to determine the price of one kilogram of rice and one kilogram of sugar. (5 marks)

- 19 Line AB drawn below is a side of a triangle ABC.



- (a) Using a pair of compasses and ruler only construct:
- triangle ABC in which  $BC = 10\text{cm}$  and  $\angle CAB = 90^\circ$ ; (2 marks)
  - a rhombus BCDE such that  $\angle CBE = 120^\circ$ ; (2 marks)
  - a perpendicular from F, the point of intersection of the diagonals of the rhombus, to meet BE at G. Measure FG; (2 marks)
  - a circle to touch all the sides of the rhombus. (1 mark)
- (b) Determine the area of the region in the rhombus that lies outside the circle. (3 marks)

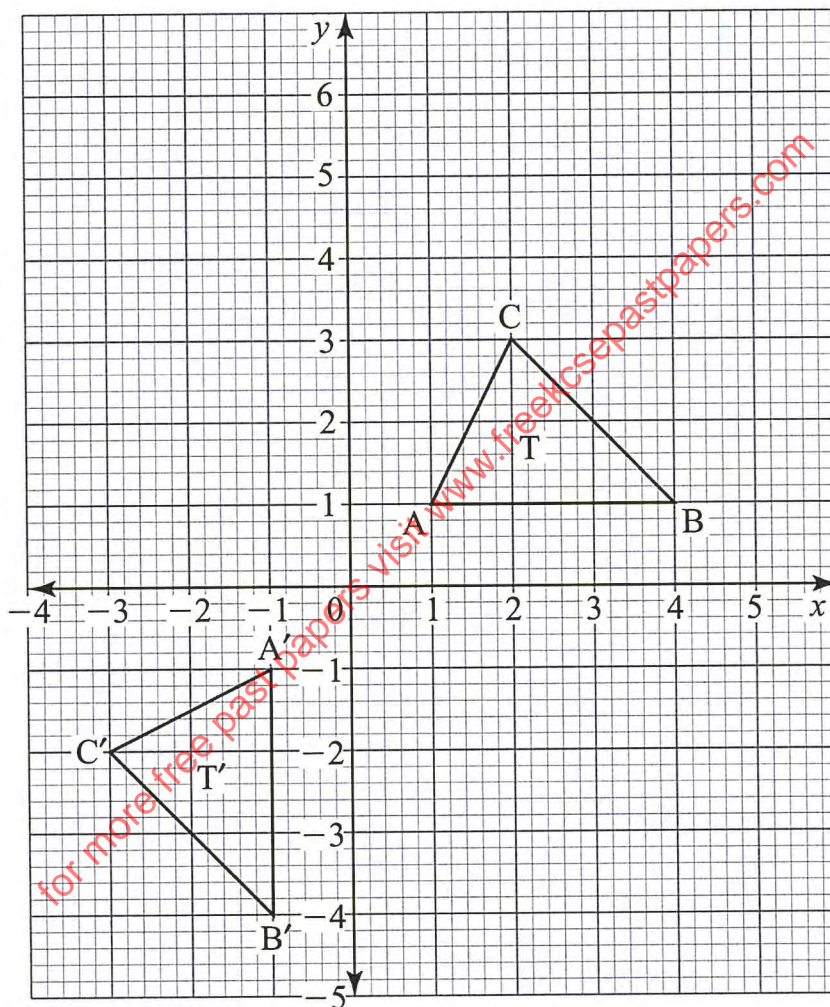
- 20 In the figure below,  $AC = 12\text{ cm}$ ,  $AD = 15\text{ cm}$  and B is point on AC.  $\angle BAD = \angle ADB = 30^\circ$ .



Calculate, correct to one decimal place:

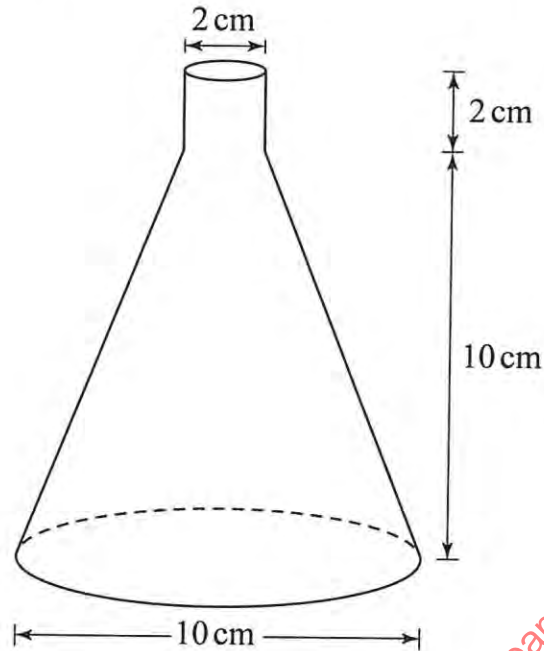
- the length of CD; (3 marks)
- the length of AB; (3 marks)
- the area of triangle BCD; (2 marks)
- the size of  $\angle BDC$ . (2 marks)

- 21 (a) A straight line  $L_1$  whose equation is  $3y - 2x = -2$  meets the  $x$ -axis at R. Determine the co-ordinates of R. (2 marks)
- (b) A second line  $L_2$  is perpendicular to  $L_1$  at R. Find the equation of  $L_2$  in the form  $y = mx + c$ , where  $m$  and  $c$  are constants. (3 marks)
- (c) A third line  $L_3$  passes through  $(-4, 1)$  and is parallel to  $L_1$ . Find:
- (i) the equation of  $L_3$  in the form  $y = mx + c$ , where  $m$  and  $c$  are constants. (2 marks)
- (ii) the co-ordinates of point S, at which  $L_3$  intersects  $L_2$ . (3 marks)
- 22 On the grid below, an object T and its image T' are drawn.



- (a) Find the equation of the mirror line that maps T onto T'. (1 mark)
- (b) (i) T' is mapped onto T'' by positive quarter turn about (0, 0). Draw T''. (2 marks)
- (ii) Describe a single transformation that maps T onto T''. (2 marks)
- (c) T'' is mapped onto T''' by an enlargement, centre (2, 0), scale factor  $-2$ . Draw T'''. (2 marks)
- (d) Given that the area of T''' is  $12 \text{ cm}^2$ , calculate the area of T. (3 marks)

- 23 The figure below represents a conical flask. The flask consists of a cylindrical part and a frustum of a cone. The diameter of the base is 10 cm while that of the neck is 2 cm. The vertical height of the flask is 12 cm.



Calculate, correct to 1 decimal place:

- (a) the slant height of the frustum part; (2 marks)
- (b) the slant height of the smaller cone that was cut off to make the frustum part. (2 marks)
- (c) the external surface area of the flask. (Take  $\pi = 3.142$ ) (6 marks)
- 24 The gradient of the curve  $y = 2x^3 - 9x^2 + px - 1$  at  $x = 4$  is 36.
- (a) Find:
- (i) the value of  $p$ ; (3 marks)
- (ii) the equation of the tangent to the curve at  $x = 0.5$ . (4 marks)
- (b) Find the co-ordinates of the turning points of the curve. (3 marks)

### 3.3.2 Mathematics Alt.A Paper 2 (121/2)

#### SECTION I (50 marks)

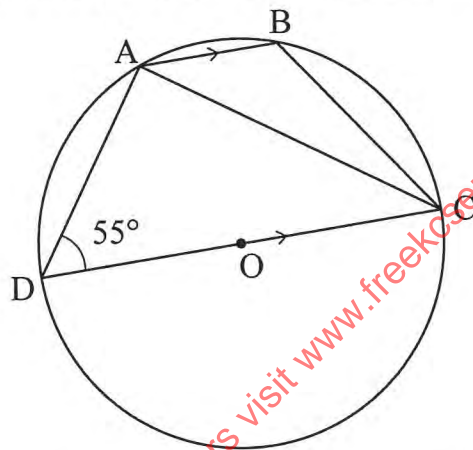
Answer **all** the questions in this section in the spaces provided.

- 1 The length and width of a rectangular piece of paper were measured as 60 cm and 12 cm respectively. Determine the relative error in the calculation of its area. (4 marks)

- 2 Simplify  $\frac{\sqrt{11}}{\sqrt{11}-\sqrt{7}}$  (2 marks)

- 3 An arc 11 cm long, subtends an angle of  $70^\circ$  at the centre of a circle. Calculate the length, correct to one decimal place, of a chord that subtends an angle of  $90^\circ$  at the centre of the same circle. (4 marks)

- 4 In the figure below, O is the centre of the circle. A, B, C and D are points on the circumference of the circle. Line AB is parallel to line DC and angle ADC =  $55^\circ$ .



Determine the size of angle ACB. (3 marks)

- 5 Eleven people can complete  $\frac{3}{5}$  of a certain job in 24 hours. Determine the time in hours, correct to 2 decimal places, that 7 people working at the same rate can take to complete the remaining job. (3 marks)

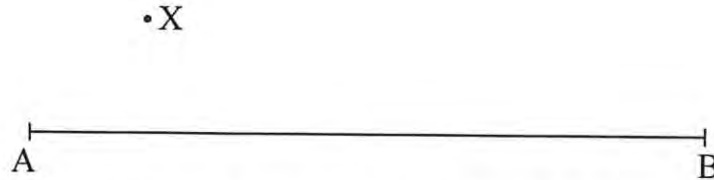
- 6 The length and width of a rectangular signboard are  $(3x + 12)$  cm and  $(x - 4)$  cm respectively. If the diagonal of the signboard is 200 cm, determine its area. (4 marks)

- 7 Find the value of  $x$  given that  $\log(x - 1) + 2 = \log(3x + 2) + \log 25$ . (3 marks)

- 8 Use the expansion of  $(x - y)^5$  to evaluate  $(9.8)^5$  correct to 4 decimal places. (3 marks)

- 9 The diameter of a circle, centre O has its end points at  $M(-1, 6)$  and  $N(5, -2)$ . Find the equation of the circle in the form  $x^2 + y^2 + ax + by = c$  where  $a$ ,  $b$  and  $c$  are constants. (4 marks)

- 10 Below is a line AB and a point X. Determine the locus of a point P equidistant from points A and B and 4 cm from X. (3 marks)



- 11 In a nomination for a committee, two people were to be selected at random from a group of 3 men and 5 women. Find the probability that a man and a woman were selected. (2 marks)
- 12 A school decided to buy at least 32 bags of maize and beans. The number of bags of maize were to be more than 20 and the number of bags of beans were to be at least 6. A bag of maize costs Ksh 2500 and a bag of beans costs Ksh 3500. The school had Ksh 100 000 to purchase the maize and beans. Write down all the inequalities that satisfy the above information. (4 marks)
- 13 Evaluate  $\int_2^4 x^2 + 2x - 15 dx$ . (3 marks)
- 14 The positions of two points P and Q, on the surface of the earth are P(45°N, 36°E) and Q(45°N, 71°E). Calculate the distance, in nautical miles, between P and Q, correct to 1 decimal place. (3 marks)
- 15 Solve the equation  $\sin\left(\frac{1}{2}x - 30^\circ\right) = \cos x$  for  $0 < x < 90^\circ$ . (2 marks)
- 16 The position vectors of points P, Q and R are  $\mathbf{OP} = \begin{pmatrix} -3 \\ 6 \end{pmatrix}$ ,  $\mathbf{OQ} = \begin{pmatrix} 2 \\ 1 \end{pmatrix}$ ,  $\mathbf{OR} = \begin{pmatrix} 4 \\ -1 \end{pmatrix}$ . Show that P, Q and R are collinear. (3 marks)

**SECTION II (50 marks)**

*Answer any five questions from this section in the spaces provided.*

- 17 In a retail shop, the marked price of a cooker was Ksh 36 000. Wanandi bought the cooker on hire purchase terms. She paid Ksh 6400 as deposit followed by 20 equal monthly instalments of Ksh 1750.
- (a) Calculate:
- (i) the total amount of money she paid for the cooker. (2 marks)
  - (ii) the extra amount of money she paid above the marked price. (1 mark)
- (b) The total amount of money paid on hire purchase terms was calculated at a compound interest rate on the marked price for 20 months. Determine the rate, per annum, of the compound interest correct to 1 decimal place. (4 marks)
- (c) Kaloki borrowed Ksh 36 000 from a financial institution to purchase a similar cooker. The financial institution charged a compound interest rate equal to the rate in (b) above for 24 months. Calculate the interest Kaloki paid correct to the nearest shilling. (3 marks)

- 18 Mute cycled to raise funds for a charitable organisation. On the first day, he cycled 40 km. For the first 10 days, he cycled 3 km less on each subsequent day. Thereafter, he cycled 2 km less on each subsequent day.

(a) Calculate:

(i) the distance cycled on the 10th day; (2 marks)

(ii) the distance cycled on the 16th day. (3 marks)

(b) If Mute raised Ksh 200 per km, calculate the amount of money collected. (5 marks)

- 19 The equation of a curve is given by  $y = 1 + 3 \sin x$ .

(a) Complete the table below for  $y = 1 + 3 \sin x$  correct to 1 decimal place. (2 marks)

$x^\circ$	0	30	60	90	120	150	180	210	240	270	300	330	360
$y = 1 + 3 \sin x$	1		3.6				1	-0.5			-1.6		

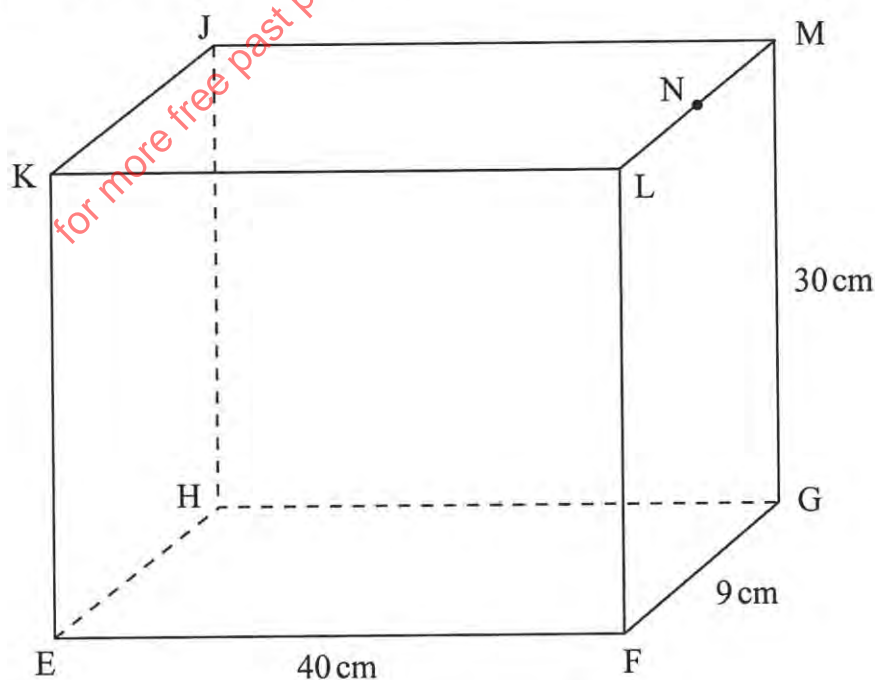
(b) (i) On the grid provided, draw the graph of  $y = 1 + 3 \sin x$  for  $0 \leq x \leq 360^\circ$ . (3 marks)

(ii) State the amplitude of the curve  $y = 1 + 3 \sin x$ . (1 mark)

(c) On the same grid draw the graph of  $y = \tan x$  for  $90^\circ \leq x \leq 270^\circ$ . (3 marks)

(d) Use the graphs to solve the equation  $1 + 3 \sin x = \tan x$  for  $90^\circ \leq x \leq 270^\circ$ . (1 mark)

- 20 The figure below represents a cuboid EFGHJKLM in which  $EF = 40$  cm,  $FG = 9$  cm and  $GM = 30$  cm. N is the midpoint of LM.



Calculate correct to 4 significant figures:

- (a) the length of GL; (1 mark)
- (b) the length of FJ; (2 marks)
- (c) the angle between EM and the plane EFGH; (3 marks)
- (d) the angle between the planes EFGH and ENH; (2 marks)
- (e) the angle between the lines EH and GL. (2 marks)

21 A quantity P varies partly as the square of m and partly as n. When  $P = 3.8$ ,  $m = 2$  and  $n = -3$ . When  $P = -0.2$ ,  $m = 3$  and  $n = 2$ .

- (a) Find:
  - (i) the equation that connects P, m and n; (4 marks)
  - (ii) the value of P when  $m = 10$  and  $n = 4$ . (1 mark)
- (b) Express m in terms of P and n. (2 marks)
- (c) If P and n are each increased by 10%, find the percentage increase in m correct to 2 decimal places. (3 marks)

22 A particle was moving along a straight line. The acceleration of the particle after t seconds was given by  $(9 - 3t) \text{ ms}^{-2}$ . The initial velocity of the particle was  $7 \text{ ms}^{-1}$ .

Find:

- (a) the velocity (v) of the particle at any given time (t); (4 marks)
- (b) the maximum velocity of the particle; (3 marks)
- (c) the distance covered by the particle by the time it attained maximum velocity. (3 marks)

23 The marks scored by 40 students in a mathematics test were as shown in the table below.

Marks	48–52	53–57	58–62	63–67	68–72	73–77
Number of students	3	4	10	12	8	3

- (a) Find the lower class boundary of the modal class. (1 mark)
- (b) Using an assumed mean of 64, calculate the mean mark. (3 marks)
- (c) (i) On the grid provided, draw the cumulative frequency curve for the data. (3 marks)
- (ii) use the graph to estimate the semi-interquartile range (3 marks)



- 24 A quadrilateral with vertices at K(1, 1), L(4, 1), M(2, 3) and N(1, 3) is transformed by a matrix  $T = \begin{pmatrix} 1 & 3 \\ 0 & 1 \end{pmatrix}$  to a quadrilateral K'L'M'N'
- (a) Determine the coordinates of the image. (3 marks)
- (b) On the grid provided draw the object and the image. (2 marks)
- (c) (i) Describe fully the transformation which maps KLMN onto K'L'M'N'. (2 marks)
- (ii) Determine the area of the image. (1 mark)
- (d) Find a matrix which maps K'L'M'N' onto KLMN. (2 marks)

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### 3.4.1 MATHEMATICS ALTERNATIVE B (122)

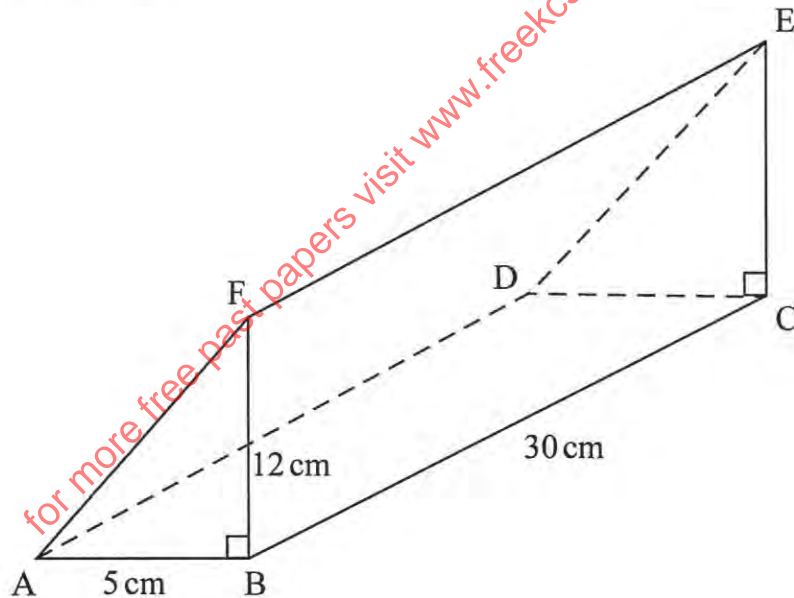
#### 3.4.1 Mathematics Alt.B Paper 1 (122/1)

#### SECTION I (50 marks)

Answer *all* the questions in this section in the spaces provided.

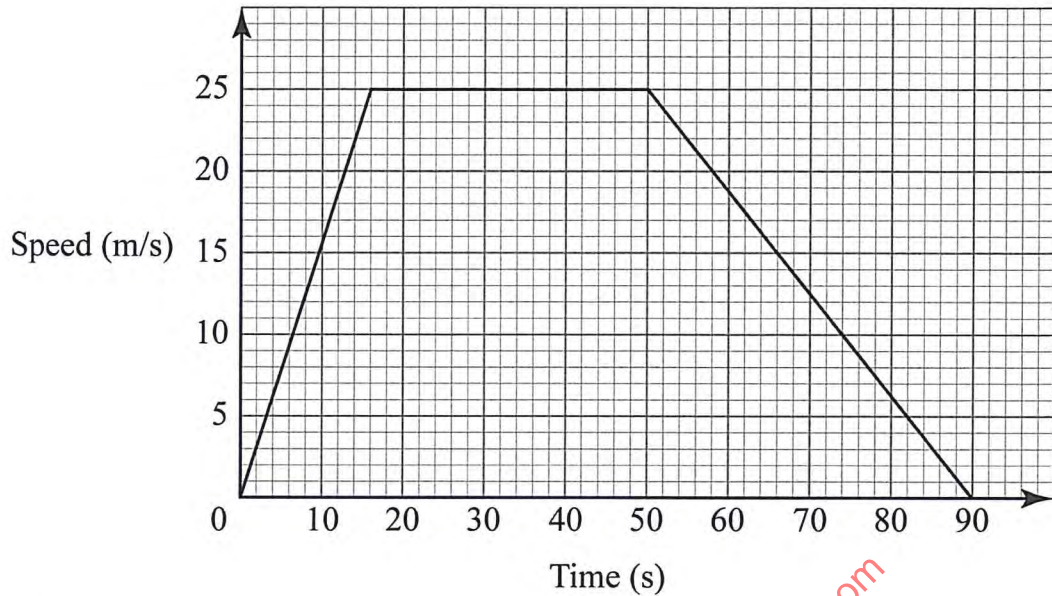
- 1 The population of a certain county was three hundred sixty eight thousand eight hundred and forty nine. Two reporters, A and B gave this figure correct to 3 significant figures and to the nearest hundreds respectively. Find the difference between the numbers given by the reporters. (2 marks)
- 2 A tailor had a ribbon which he intended to cut into equal lengths of either 28 cm, 16 cm or 40 cm. Determine:
- (a) the shortest length of ribbon that he would use to obtain an exact number of pieces; (2 marks)
- (b) the number of 16 cm pieces that can be obtained from the ribbon. (1 mark)
- 3 A metal bar with a cross-sectional area of  $44 \text{ cm}^2$  has a mass of 5.06 kg. The density of the bar is  $2.3 \text{ g/cm}^3$ . Calculate the length, in cm, of the bar. (3 marks)
- 4 Use logarithms, correct to 4 significant figures to evaluate:
- $$\sqrt[3]{\frac{0.04068 \times 35.72}{0.2799}} \quad (3 \text{ marks})$$
- 5 Given that  $A = x^2 + 2xh$ , find the positive value of  $x$  when  $A = 360$  and  $h = 13$ . (3 marks)
- 6 A rectangular field ABCD is such that  $AB = 90 \text{ m}$  and  $BC = 70 \text{ m}$ . A well, W in the field is located 30 m from A and angle  $WAB = 45^\circ$ . A tree, T also in the field is located 40 m from B and angle  $TBA = 40^\circ$ . Using a scale drawing:
- (a) Draw the field and show the positions of W and T; (3 marks)
- (b) find the distance, in metres, between the well and the tree. (1 mark)
- 7 A chord subtends an angle of  $60^\circ$  at the circumference of a circle of radius 3.5 cm. Determine the area of the minor segment correct to 4 significant figures. (Take  $\pi = \frac{22}{7}$ ) (4 marks)
- 8 Given the inequalities  $\frac{3}{2x-1} \geq 5$  and  $x > -4$ , find the integral values of  $x$  that satisfy the inequalities. (3 marks)
- 9 Kassam spent  $\frac{1}{5}$  of his monthly salary on house rent,  $\frac{3}{8}$  on loan repayment, Ksh 26 000 on domestic expenses and saved the rest. If he saved Ksh 8 000, calculate his monthly salary. (3 marks)

- 10 A line  $L_1$  passes through  $(3, -4)$  and is perpendicular to the line  $y = 3x - 2$ . Determine:
- (a) the equation of  $L_1$  in the form  $ax + by = c$  where  $a$ ,  $b$  and  $c$  are constants. (3 marks)
- (b) the  $x$  intercept of line  $L_1$ . (1 mark)
- 11 The vertices of a triangle JKL are  $J(2,1)$ ,  $K(5,1)$  and  $L(3,3)$ . The triangle JKL is mapped onto  $J'K'L'$  by a rotation of  $+90^\circ$  about point  $(1, -1)$ . On the grid provided below, draw triangle JKL and its image  $J'K'L'$ . (3 marks)
- 12 Given that  $\cos 60^\circ = \frac{1}{2}$ , without using mathematical tables or a calculator, find:
- (a)  $\sin 60^\circ$  (2 marks)
- (b)  $\tan 30^\circ$  (1 mark)
- 13 A builder used square tiles of side 34.2 cm to cover a rectangular floor of length 307.8 cm and width 236.7 cm. Determine the number of whole square tiles that were fitted on the floor. (3 marks)
- 14 The figure below represents a triangular prism.  $AB = 5$  cm,  $BC = 30$  cm,  $BF = 12$  cm and angle ABF is a right angle.



- Calculate the surface area of the prism. (4 marks)
- 15 The volume of a hemisphere is  $41.2 \text{ cm}^3$ . Calculate, correct to one decimal place, the radius of the hemisphere. (2 marks)

- 16 The diagram below is a speed-time graph for a car that travelled between two stations in 90 seconds.



Calculate the average speed of the car correct to one decimal place. (3 marks)

### SECTION II (50 marks)

*Answer any five questions from this section in the spaces provided.*

- 17 A businessman transported bags of rice using 2 lorries and 5 pickups. Each lorry made 4 trips carrying 132 bags per trip. 3 pickups made 7 trips each and the remaining pickups made 6 trips each. The pickups carried the same number of bags each per trip. The ratio of the number of bags transported by the lorries to that transported by the pickups was 8:3.
- (a) Calculate:
- the total number of bags transported; (3 marks)
  - the number of bags carried by a pickup per trip. (4 marks)
- (b) The cost per trip for each lorry was Ksh 5 000 and that of a pickup was Ksh 1 500. Calculate the total cost of transporting the rice. (3 marks)
- 18 A rectangular piece of land has a perimeter of 84 m. Its length is 12 m longer than its width.
- (a) If the width is  $x$  m:
- write an expression for the perimeter of the land; (1 mark)
  - find the ratio of the length to the width. (4 marks)
- (b) The piece of land was fenced with 4 strands of barbed wire allowing 30 cm for binding at each end of a strand. A space of 3 m on one side of the land was left for the gate.
- Determine the length of barbed wire that was used. (3 marks)
  - If the fencing poles were 3 m apart, determine the number of poles used. (2 marks)

19 The base of an open rectangular tank is 3 m by 2.5 m and its height is 4 m.

(a) Calculate:

(i) the capacity of the tank in litres. (3 marks)

(ii) the surface area in  $\text{m}^2$  of the tank. (2 marks)

(b) An open cylindrical tank has an equal capacity and same height as the rectangular tank in (a) above. Calculate, correct to one decimal place:

(i) the radius of the cylindrical tank; (3 marks)

(ii) the surface area in  $\text{m}^2$  of the tank. (2 marks)

20 (a) Using a ruler and a pair of compasses only, construct triangles ABC and ABD on opposite sides of line AB below, such that  $\angle DAB = \angle DBA = \angle ABC = \angle BAC = 60^\circ$ . (2 marks)



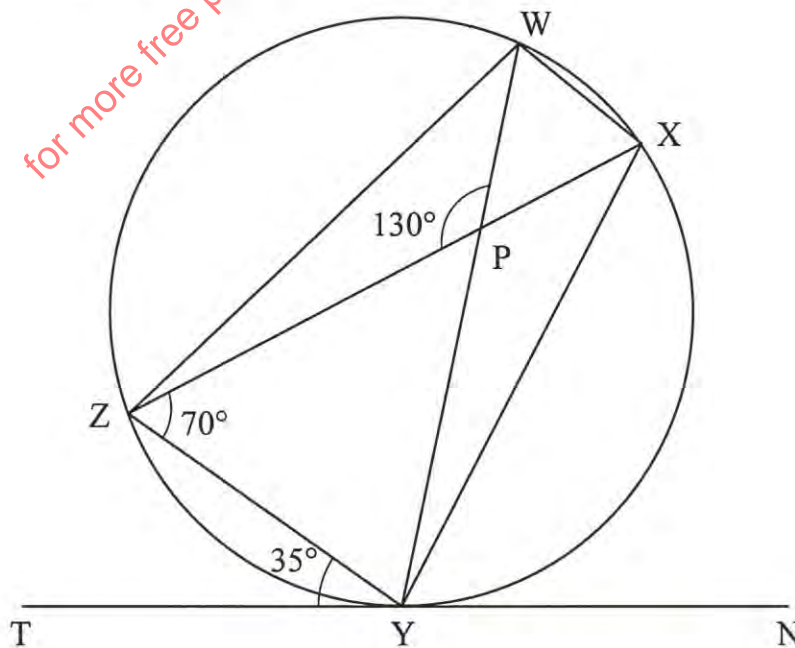
(b) (i) Name the quadrilateral ADBC. (1 mark)

(ii) State two properties of the quadrilateral. (2 marks)

(c) Construct a circle touching all the sides of the quadrilateral. (2 marks)

(d) Determine, correct to one decimal place, the area of the region enclosed by the quadrilateral but outside the circle. (3 marks)

21 In the figure below WXYZ is a cyclic quadrilateral and TYN is a tangent to the circle at Y. Angle  $\text{TYZ} = 35^\circ$ , angle  $\text{YZX} = 70^\circ$  and angle  $\text{WPZ} = 130^\circ$ .



Giving reasons, find the size of:

- (a)  $\angle XYN$ ; (2 marks)
- (b)  $\angle ZYX$ ; (2 marks)
- (c)  $\angle ZXY$ ; (2 marks)
- (d)  $\angle ZWY$ ; (2 marks)
- (e)  $\angle WXZ$ . (2 marks)

22 A salesman sold 300 bags of animal feeds to a retailer at Ksh 1 700 each. He was given a commission of 3% on 120 of the bags and 2% on the remaining bags. The salesman allowed a discount of 1.2% on  $\frac{3}{5}$  of the bags sold. This discount was deducted from his commission.

- (a) Calculate:
  - (i) the discount allowed; (2 marks)
  - (ii) the net commission the salesman got. (3 marks)
- (b) The retailer sold all the bags at Ksh 1 850 each and paid Ksh 3 000 for transport. Calculate the profit made by the retailer. (3 marks)
- (c) In addition, a value added tax (VAT) of 16% was charged on the profit made by the retailer. Calculate the amount of tax collected. (2 marks)

23 A piece of wire is bent to form the sides of a rectangle whose length is 6 cm more than the width. The area of the rectangle formed is  $567 \text{ cm}^2$ .

- (a) Determine the length of the wire. (4 marks)
- (b) The same piece of wire could be bent to form a semi-circle. Determine the area that would be enclosed by the semi-circle, correct to one decimal place. (4 marks)
- (c) Express the area of the semi-circle as a percentage of the area of the rectangle, correct to 3 significant figures. (2 marks)

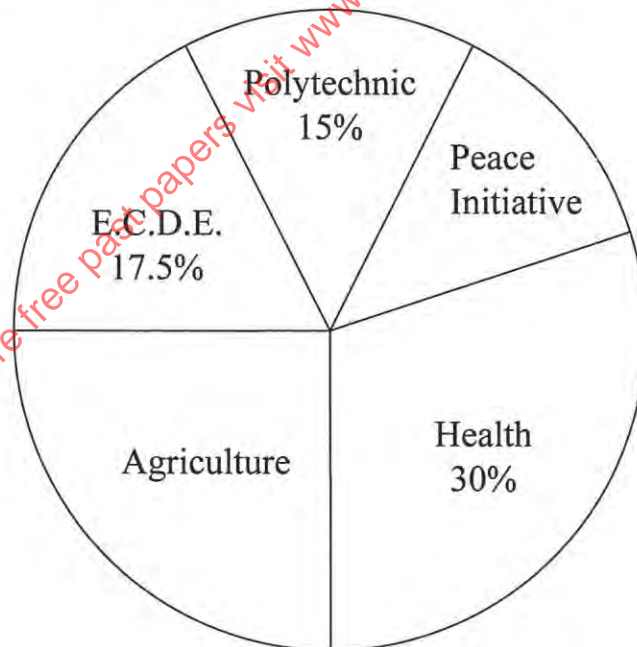
24 A cattle ranch is in the shape of a parallelogram. The length of one side is 600 m and the other is 500 m. The smaller angle between the sides is  $30^\circ$ .

- (a) Calculate the area, in hectares, of the ranch. (3 marks)
- (b) A water point in the shape of a regular hexagon of side 10 m is built in the ranch. Calculate:
  - (i) the grazing area, in hectares, correct to 3 decimal places. (4 marks)
  - (ii) the number of cattle that can be kept in the ranch if one animal requires a grazing area of 0.625 ha. (3 marks)

## SECTION I (50 marks)

Answer *all* the questions in this section in the spaces provided.

- 1 Use a calculator to evaluate  $\frac{(3.84)^2 - \sqrt[3]{110.592}}{0.03885}$  (2 marks)
- 2 In a certain year, Ondege's annual salary was Ksh 120 600. For the next seven years, his annual increment was Ksh 2 880. Determine:
- (a) Ondege's annual salary in the 7th year; (2 marks)
- (b) the total salary that Ondege earned during the first six years. (2 marks)
- 3 A curve crosses the  $x$ -axis at  $x = 1\frac{1}{3}$  and  $x = -\frac{1}{2}$ . Determine the equation of the curve in the form  $ax^2 + bx + c = 0$  where  $a$ ,  $b$  and  $c$  are integers. (2 marks)
- 4 Sifa invested an amount of money in a financial institution which paid a simple interest rate of 5% per annum. After  $3\frac{1}{2}$  years, the total amount of money in Sifa's account was Ksh 37 600. Calculate the amount of money that Sifa invested. (3 marks)
- 5 A county allocated funds for various projects as shown in the pie-chart below.



The allocation for Agriculture was twice that of Peace Initiative. Calculate the size of the angle of the sector that represents the Peace Initiative. (3 marks)

- 6 Given that matrix  $A = \begin{pmatrix} 2 & 1 & 2 \\ 3 & 2 & 1 \end{pmatrix}$  and  $B = \begin{pmatrix} 1 & 0 \\ 2 & 1 \\ 1 & 2 \end{pmatrix}$ , determine  $2(AB)$ . (3 marks)

- 7 The table below shows the amount of milk, in litres, delivered to a milk processing plant, on a certain day, by 80 farmers.

Milk in litres	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49
No. of farmers	2	6	14	24	13	10	8	3

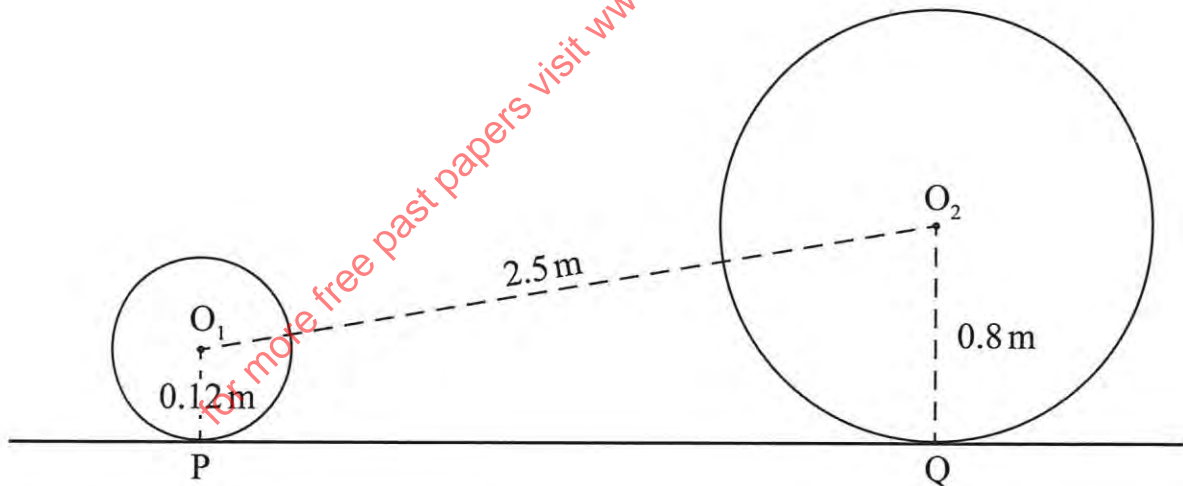
Estimate, by calculation, the median. (3 marks)

- 8 A point A is mapped onto  $A'(4, -6)$  by a transformation whose matrix is  $\begin{pmatrix} 2 & 0 \\ 0 & -2 \end{pmatrix}$ .  
Find the co-ordinates of A. (3 marks)

- 9 In a children's home, the amount of water in litres (L) used per month is partly constant and partly varies with the number  $n$ , of the children. In a certain month, there were 50 children and the amount of water used was 78 000 L. In another month, there were 70 children and 85 200 L of water was used.

- (a) Form an equation connecting L and  $n$ . (1 mark)  
(b) Determine the amount of water used in a month when the number of children was 100. (3 marks)

- 10 The figure below shows two circles, centres  $O_1$  and  $O_2$ . PQ is a common tangent to the circles. The radius of the smaller circle is 0.12 m while the radius of the larger circle is 0.8 m. The distance between  $O_1$  and  $O_2$  is 2.5 m.



Calculate the length PQ, correct to 2 decimal places. (3 marks)

- 11 T and R are two towns on the equator. The longitude of T is  $12^\circ\text{E}$  and that of R is  $5^\circ\text{W}$ . If the local time at T is 2245 h, find the time at R in the 12-hour clock system. (4 marks)
- 12 Given that  $4 \tan x - 5 = 0$ , find the value of  $x$  correct to 2 decimal places for  $0^\circ \leq x \leq 360^\circ$ . (3 marks)



- 13 A box contains 13 balls which are identical except for the colour. Three of the balls are red while the rest are white. Two balls are picked at random from the box, one at a time, without replacement.

- (a) Using a tree diagram, show all the possible outcomes. (2 marks)  
 (b) Find the probability that a red and a white ball are picked. (2 marks)

- 14 The  $x$  and  $y$  values of points on a curve are as shown in the table below.

$x$	0.5	1	1.5	2	2.5	3
$y$	1	3	6	10	15	21

Using the trapezium rule, estimate the area bounded by the curve, the  $x$ -axis and the lines  $x = 0.5$  and  $x = 3$ . (3 marks)

- 15 Points P, Q and R lie on a straight line, such that  $PQ = \frac{3}{4}PR$ . Given  $P(2,5)$  and  $R(6,1)$ , express in terms of  $i$  and  $j$ :

- (a) the position vector of P; (1 mark)  
 (b)  $PQ$ . (2 marks)

- 16 In an experiment, water was heated and its temperature changes recorded at intervals of 2 minutes as shown in the table below.

Time (min)	0	2	4	6	8	10	12	14	16
Temperature ( $^{\circ}\text{C}$ )	25	35	42.5	50	60	67.5	77.5	85	92.5

- (a) On the grid provided, plot the points and draw the line of best fit. (2 marks)  
 (b) Use the line of best fit to estimate the time taken for the temperature of the water to reach  $75^{\circ}\text{C}$ . (1 mark)

### SECTION II (50 marks)

Answer any **five** questions from this section in the spaces provided.

- 17 A factory blends three types of juice in the ratios  $A:B = 3:4$  and  $B:C = 1:2$ .

- (a) Determine:  
 (i) the ratio  $A:B:C$ ; (1 mark)  
 (ii) the amount of type A juice in a 20-litre mixture. (2 marks)  
 (b) The cost of producing one litre of A is Ksh 80, one litre of B is Ksh 84 and one litre of C is Ksh 90.  
 (i) Find the cost of producing one litre of the mixture. (2 marks)  
 (ii) Calculate the selling price of one litre of the mixture if the factory makes a profit of 25%. (2 marks)

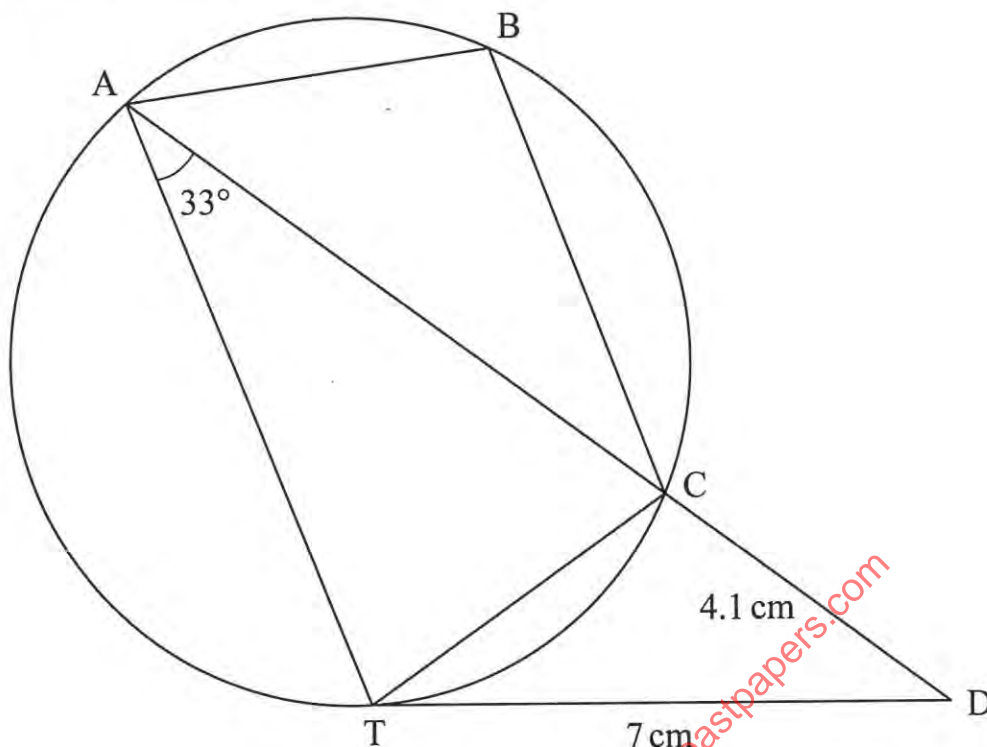
- (c) The factory uses two types of machines P and Q to blend the juices. Machine P takes 7 hours to blend 14 000 litres and Q takes 5 hours to blend 12 000 litres. Determine the time it would take the factory to blend 550 000 litres. (3 marks)

- 18 The diagram below represents a map of a settlement scheme. The map is drawn on a one centimetre square grid. The scale of the map is 1:50 000.



- (a) Estimate:
- the area of the map in square centimetres; (2 marks)
  - the area of the settlement scheme in square kilometres. (3 marks)
- (b) The settlement scheme was sub-divided into parcels of land each of 5 hectares.
- Find the number of the 5 hectare parcels of land obtained. (3 marks)
  - Determine the area in hectares of the settlement scheme that remained after the sub-division. (2 marks)

- 19 In the figure below, TD is a tangent to the circle at T. Chord AC produced intersects TD at D.  $CD = 4.1$  cm,  $TD = 7$  cm and angle  $TAC = 33^\circ$ .



- (a) Giving a reason, find the size of angle CTD. (2 marks)
- (b) Calculate the length of AC correct to one decimal place. (3 marks)
- (c) Calculate to the nearest degree the value of:
- (i) the obtuse angle TCD; (3 marks)
- (ii) angle ABC. (2 marks)
- 20 (a) Complete the table below for values of  $y = x^3 + 3x^2 + 5$  for  $-4 \leq x \leq 2$ , correct to 1 decimal place. (2 marks)

$x$	-4	-3.5	-3	-2.5	-2	-1.5	-1	-0.5	0	0.5	1	1.5	2
$y$		-1.1	5		9			5.6		5.9		15.1	

- (b) On the grid provided, draw the graph of  $y = x^3 + 3x^2 + 5$  for  $-4 \leq x \leq 2$ . Use the scale: 2 cm for 1 unit on the  $x$ -axis and 2 cm for 5 units on the  $y$  axis. (3 marks)
- (c) Using the graph, determine:
- (i) the average rate of change between  $x = 0.5$  and  $x = 1.8$ ; (2 marks)
- (ii) the instantaneous rate of change of the curve at  $x = -3$ , correct to one decimal place. (3 marks)

- 21 A pavement is of length  $(x - 1)$  m and width  $(x - 8)$  m. The area of the pavement is  $4.56 \text{ m}^2$ .
- (a) (i) Write a quadratic equation for the area of the pavement in the form  $ax^2 + bx + c = 0$  where  $a$ ,  $b$  and  $c$  are constants. (2 marks)
- (ii) Using the method of completing the square, find the actual length and width of the pavement. (6 marks)
- (b) The pavement is covered with rectangular tiles measuring  $0.4 \text{ m}$  by  $0.3 \text{ m}$ . Determine the number of tiles used to cover the pavement completely. (2 marks)
- 22 Omari bought a house valued for Ksh 4 000 000. The value of the house appreciated at 20% per annum for the first three years and then at 15% per annum for the next two years.
- (a) Calculate the value of the house after:
- (i) three years, (2 marks)
- (ii) five years. (2 marks)
- (b) After the five years, the value of the house depreciated for the next two years. At the end of the two years, Omari sold the house through an agent. Omari received Ksh 7 125 000 after paying a 5% commission to the agent.
- Calculate:
- (i) the value of the house after the two years; (2 marks)
- (ii) the annual rate of depreciation in the two years. (4 marks)
- 23 A quadrilateral ABCD has vertices  $A(-3, 1)$ ,  $B(-2, 3)$ ,  $C(-3, 4)$  and  $D(-4, 3)$ .
- (a) (i) Find the co-ordinates of  $A'B'C'D'$ , the image of ABCD, under a transformation whose matrix is  $\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$ . (2 marks)
- (ii) On the grid provided, draw the quadrilateral ABCD and its image  $A'B'C'D'$ . (2 marks)
- (b)  $A''B''C''D''$  is the image of  $A'B'C'D'$  under a transformation whose matrix is  $\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$ , followed by an enlargement scale factor 2, centre  $(0,0)$ .
- (i) Determine the co-ordinates of  $A''B''C''D''$ . (2 marks)
- (ii) On the same grid as in (a) (ii) above, draw  $A''B''C''D''$ . (1 mark)
- (iii) Find a single transformation matrix that maps  $A''B''C''D''$  onto ABCD. (3 marks)

- 24 The masses, to the nearest kg, of 65 patients who attended a medical clinic are as shown in the table below:

Mass (kg)	26–30	31–35	36–40	41–45	46–50	51–55
Frequency (f)	9	13	20	15	6	2

Calculate:

- (a) the mean mass of the patients; (4 marks)
- (b) (i) the variance mass; (5 marks)
- (ii) the standard deviation. (1 mark)

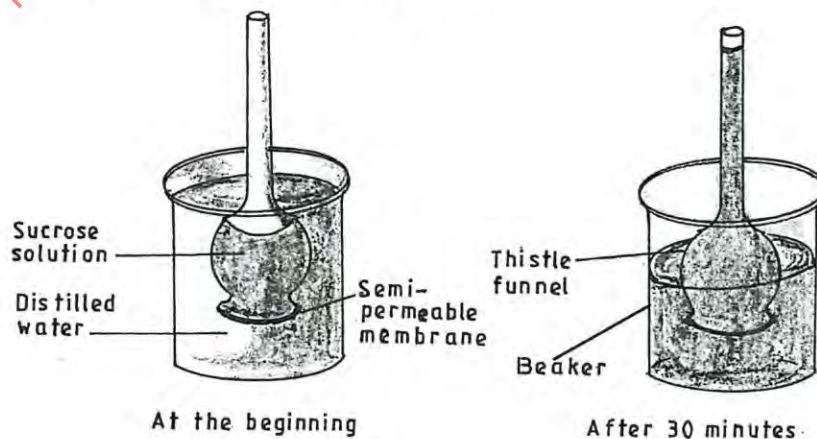
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### 3.5 BIOLOGY (231)

#### 3.5.1 Biology Paper 1 (231/1)

Answer *all* the questions in the spaces provided.

- 1 (a) What is meant by the term binomial nomenclature? (1 mark)
- (b) State **two** guidelines that should be followed when typing scientific names. (2 marks)
- 2 During a lesson, students observed the structure of bat, cat and human forelimbs to determine their evolutionary relationship.
- (a) State the name given to the structure of the limbs observed by the students. (1 mark)
- (b) Name the type of evolution illustrated by the structure of the limbs observed. (1 mark)
- (c) What evidence of evolution is illustrated by the limbs? (1 mark)
- (d) State the significance of the type of evolution illustrated by the limbs. (1 mark)
- 3 An individual is of blood group **B** positive.
- (a) Name the antigens in the individual's blood. (2 marks)
- (b) Give the reason why the individual **cannot** receive blood from a blood group **A** donor. (2 marks)
- 4 Colour blindness is a sex linked trait controlled by a recessive gene **b**. If a mother is a carrier and the father is normal, what is the chance that their son will be colour blind? Show your working. (4 marks)
- 5 (a) State **two** advantages of using a coverslip when preparing a specimen for observation under a light microscope. (2 marks)
- (b) How is the low power objective lens manipulated to focus a specimen for observation under a light microscope? (2 marks)
- 6 Students set up an experiment as illustrated below.



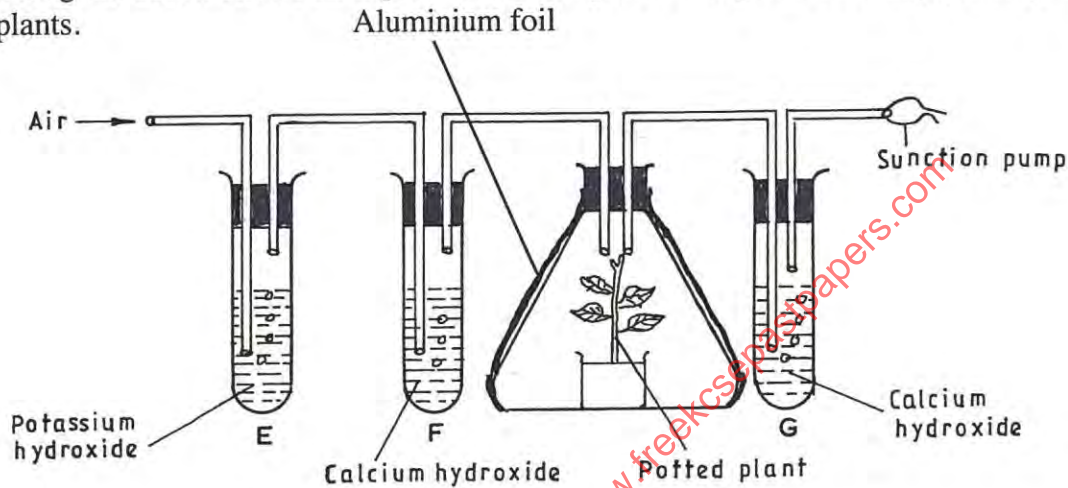
- (a) Name the physiological process that resulted in the observations made after 30 minutes. (1 mark)

- (b) State the importance of the physiological process investigated in plants. (1 mark)
- (c) Explain the observations made after 30 minutes. (2 marks)

7 How is a guard cell structurally adapted for gaseous exchange? (4 marks)

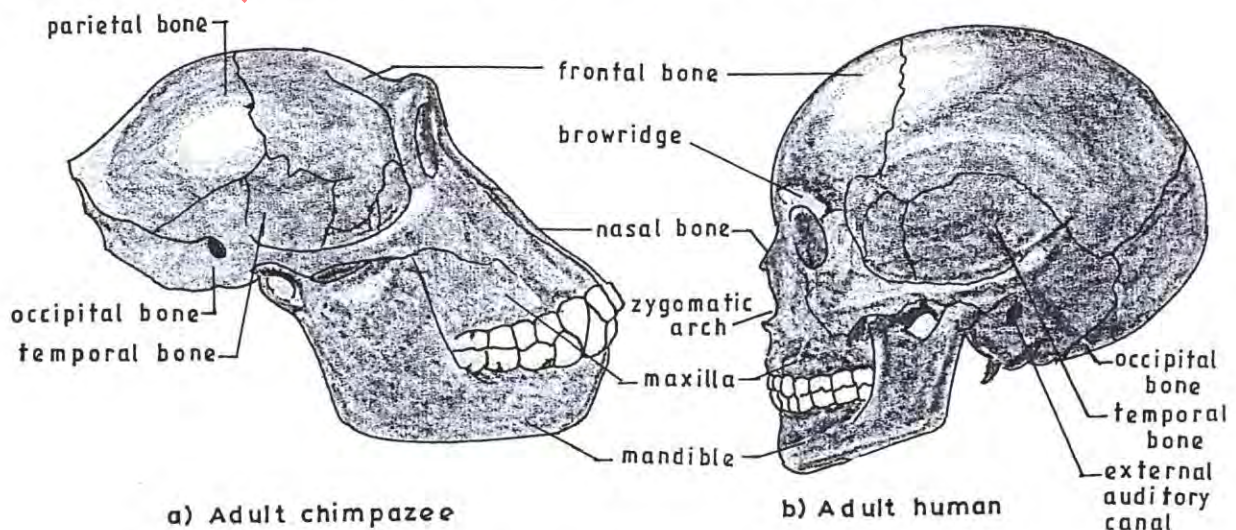
- 8 (a) Name the organism that:
- (i) causes malaria; (1 mark)
- (ii) transmits malaria. (1 mark)
- (b) State **two** control measures for malaria. (2 marks)

9 The diagram below shows an experimental set up to investigate a certain physiological process in plants.



- (a) State the aim of the experiment. (1 mark)
- (b) State the role of the following in the experiment:
- (i) potassium hydroxide; (1 mark)
- (ii) aluminium foil. (1 mark)
- (c) Account for the expected colour change in tube F. (2 marks)

10 The diagram below illustrates the skulls of adult human and chimpanzee.



(a) State **one** difference between the two skulls in the following structures:

(3 marks)

	Structure	Chimpanzee Skull	Human Skull
(i)	Parietal bones		
(ii)	Mandible		
(iii)	Browridge		

(b) State the significance of the evolution observed on the parietal bone in the chimpanzee and human skulls. (1 mark)

11 Name **two** structures used for gaseous exchange in plants. (2 marks)

12 (a) What is meant by each of the following:

(i) pyramid of biomass? (1 mark)

(ii) pyramid of numbers? (1 mark)

(b) During an ecological visit to the Savanna Grassland, students were able to see lions, antelopes, vultures and pastoralists grazing their cattle. Construct a food chain with four consumer levels to illustrate the energy flow in the ecosystem. (2 marks)

13 State **three** differences between the end products of mitosis and meiosis. (3 marks)

**Mitosis**

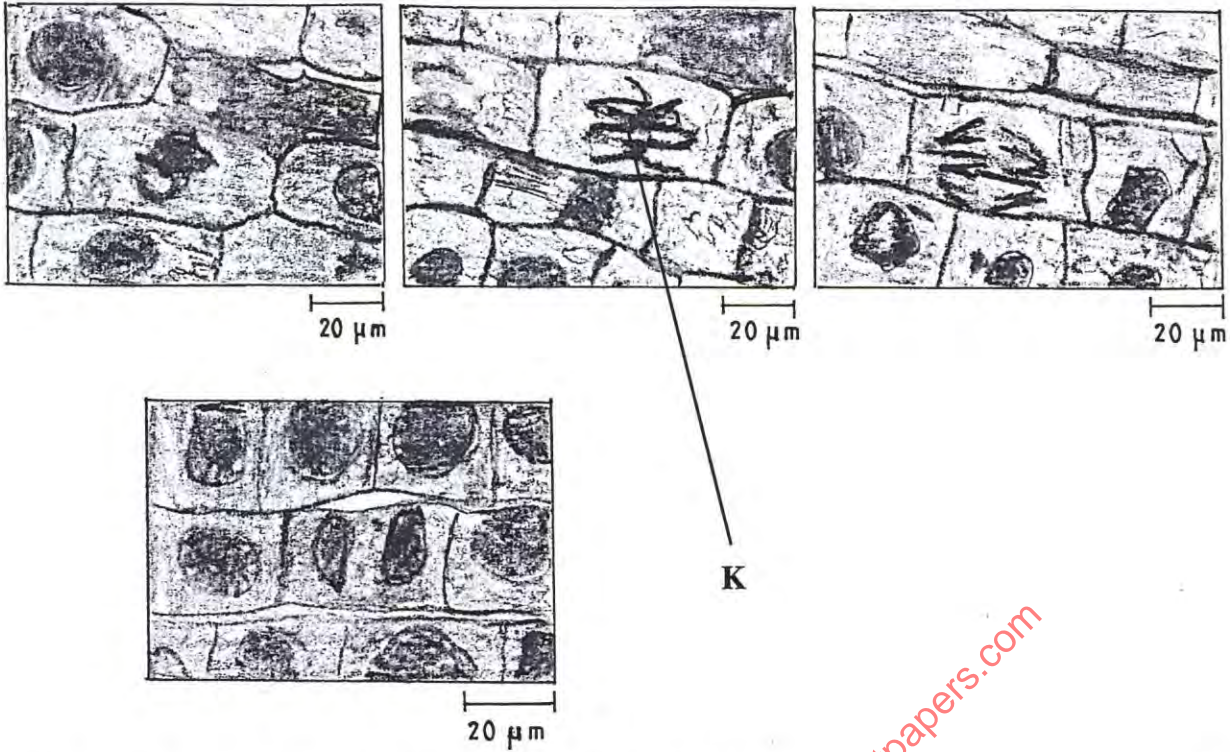
**Meiosis**

14 (a) Name **two** types of involuntary muscles in mammals. (2 marks)

(b) State the location of each of the muscles named in (a) above. (2 marks)



15 The photomicrographs below show the various stages of cell division in a certain plant.



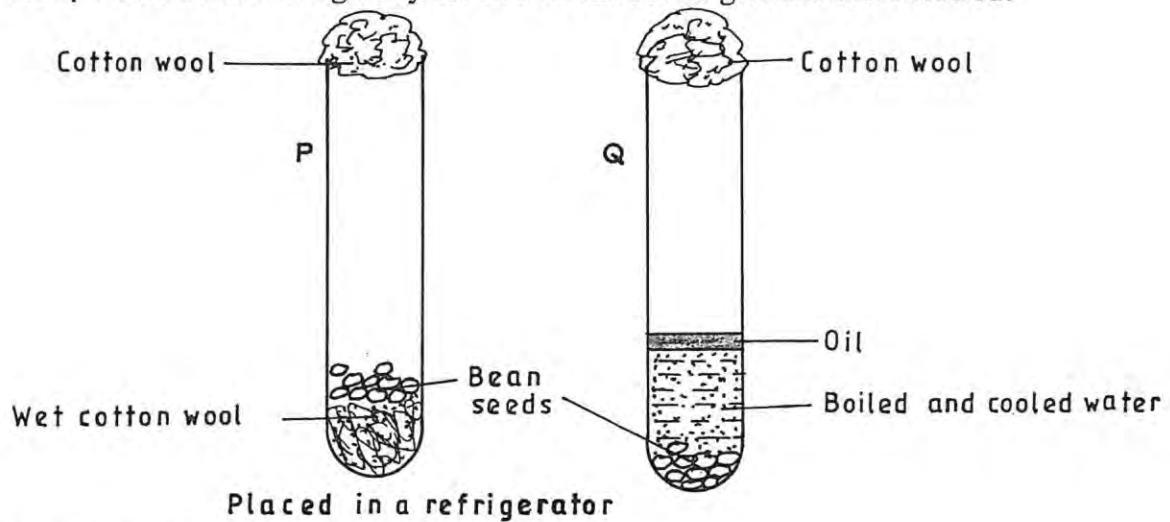
- (a) (i) Name the type of cell division illustrated. (1 mark)  
 (ii) Give a reason for your answer in (a) (i) above. (1 mark)
- (b) (i) Name the stage of cell division labelled **K**. (1 mark)  
 (ii) Give a reason for your answer in (b) (i) above. (1 mark)
- 16 State **four** structural differences between millipedes and centipedes. (4 marks)

**Millipedes**

**Centipedes**

- 17 (a) How is a human stomach adapted to
- (i) protein digestion? (2 marks)  
 (ii) churning? (2 marks)
- (b) What happens to the glucose synthesized during photosynthesis? (2 marks)

- 18 The diagram below shows an experimental set-up to investigate the conditions necessary for germination. Test tube P was placed in a refrigerator while Q was left at room temperature. The set-ups were observed regularly for two weeks but no germination occurred.

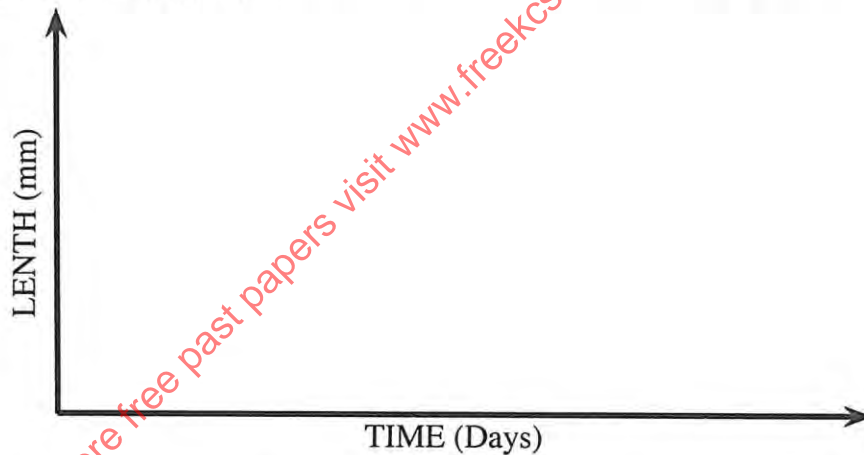


Explain the observations in P and Q.

P (2 marks)

Q (3 marks)

- 19 (a) Using the axes provided below, sketch a curve to illustrate the growth pattern observed in the phylum arthropoda. (2 marks)



(b) Explain the growth pattern observed in arthropods. (3marks)

20 Below are components of a simple reflex pathway:

- interneurone;
- muscle;
- motor neurone;
- sensory neurone;
- pain receptor;
- central nervous system.

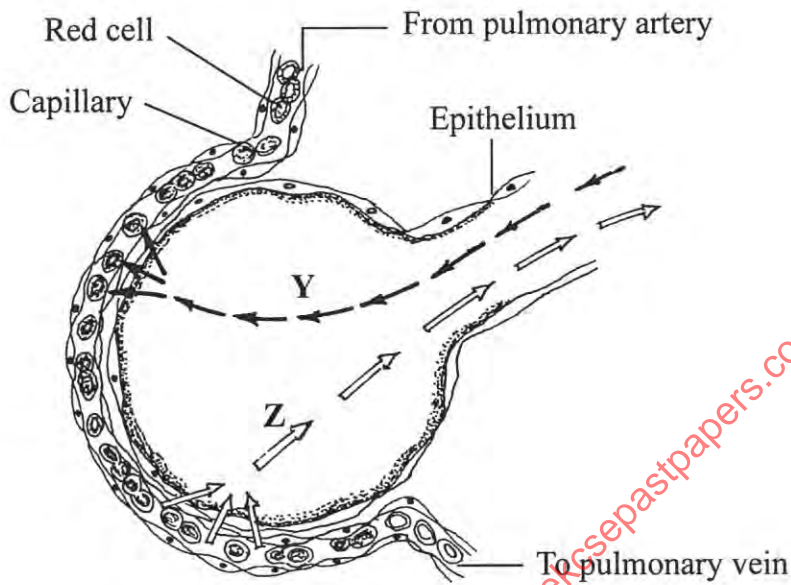
List the components in their proper sequence during the transmission of a nerve impulse.

(3 marks)

SECTION A (40 marks)

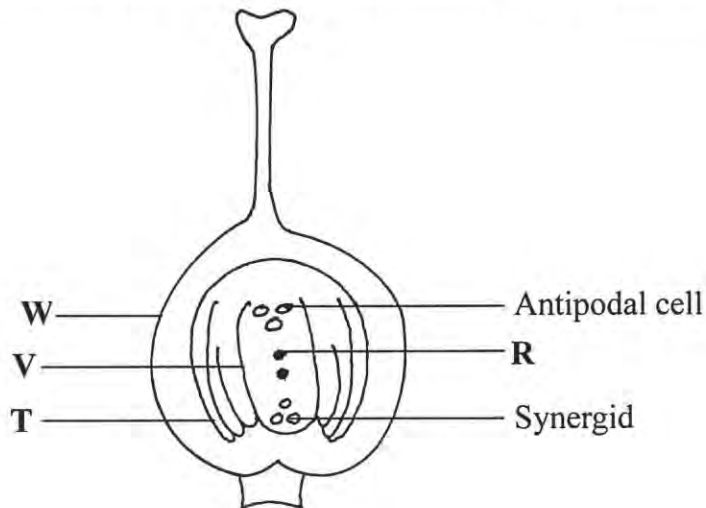
Answer **all** the questions in this section in the spaces provided.

- 1 The diagram below illustrates a blood capillary surrounding a structure for gaseous exchange in human beings.



- (a) Name the gaseous exchange structure. (1 mark)
- (b) Identify the gases labelled Y and Z. (1 mark)
- Y .....
- Z .....
- (c) How does the gas labelled Y reach the inside of the blood capillary? (3 marks)
- (d) How does cigarette smoking lead to lung cancer? (2 marks)

- 2 The diagram below illustrates the structure of the female part of a flower.



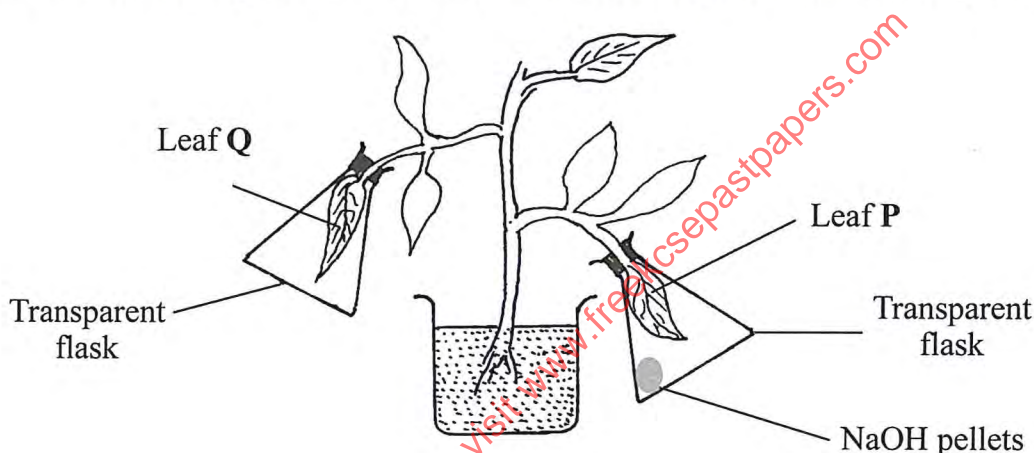
- (a) Name the part labelled **W**. (1 mark)
- (b) Describe what happens when the pollen tube enters the structure labelled **V**. (5 marks)
- (c) What do the structures labelled **R** and **T** develop into after fertilization?

**R** ..... (1 mark)

**T** ..... (1 mark)

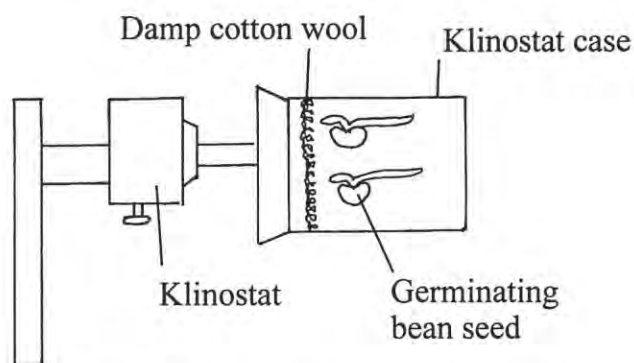
- 3
- (a) What is meant by the term genetics? (1 mark)
  - (b) State two examples of discontinuous variation. (2 marks)
  - (c) A female with sickle cell trait marries a normal man. The allele for sickle cell is  $Hb^s$  and the normal allele is  $Hb^A$ . Determine the probability that their first born will have the sickle cell trait. Show your working. (5 marks)

4 In an experiment to investigate a factor affecting photosynthesis, a potted plant which had been kept in the dark overnight was treated as shown in the diagram below and exposed to light.



- (a) Why was the potted plant kept in the dark overnight? (1 mark)
- (b) Which factor was being investigated in the experiment? (1 mark)
- (c) (i) Which test did the students perform to confirm photosynthesis in the leaves labelled **P** and **Q**? (1 mark)
- (ii) State the results obtained in the leaves labelled **P** and **Q**.
  - P** ..... (1 mark)
  - Q** ..... (1 mark)
- (iii) Explain the results obtained in the leaves labelled **P** and **Q**.
  - P** ..... (1 mark)
  - Q** ..... (1 mark)
- (d) What was the purpose of leaf **Q** in the experiment? (1 mark)

- 5 In an experiment to investigate a plant response, the set up shown in the diagram below was used.



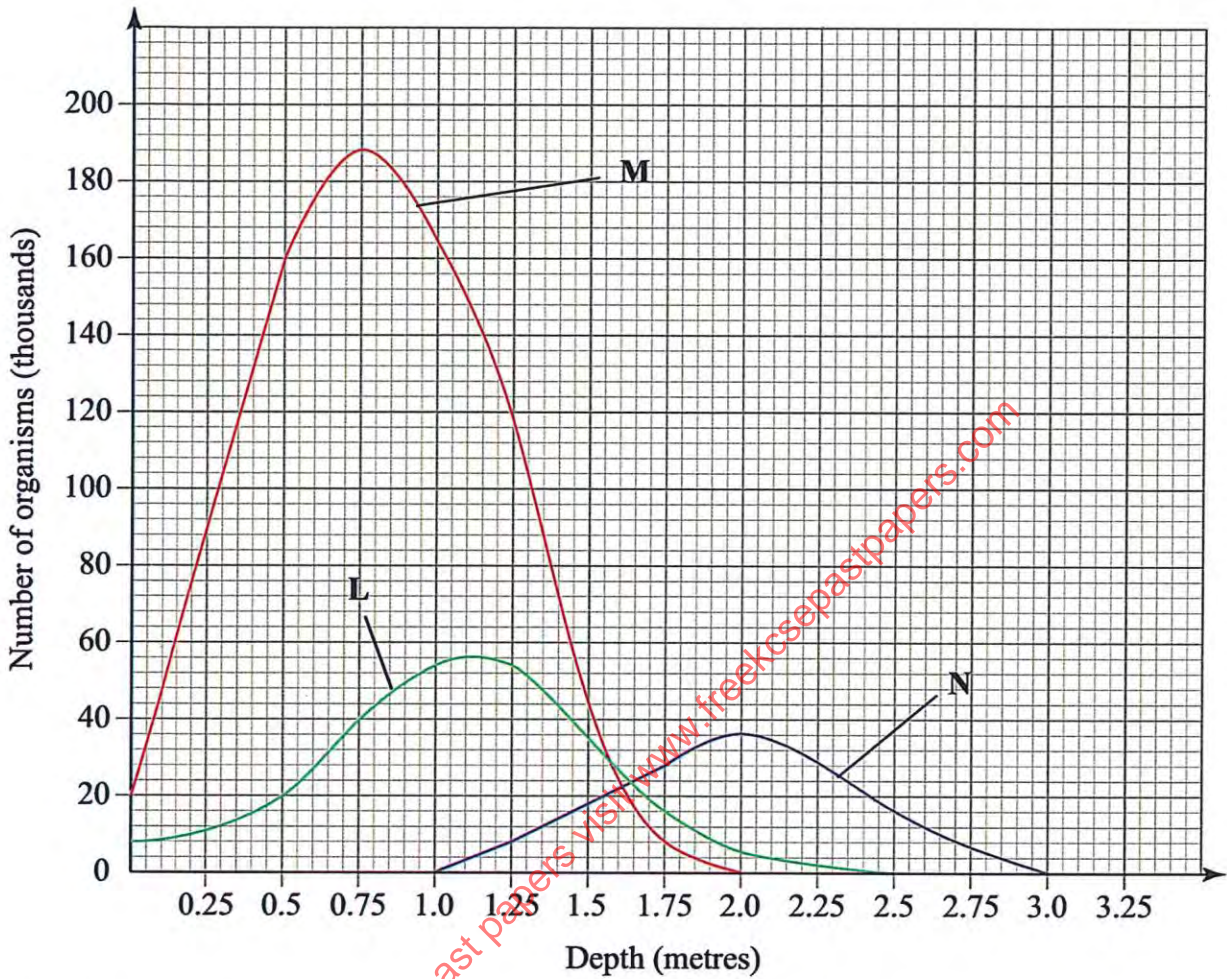
- (a) Name the type of response that was being investigated. (1 mark)
- (b) If the Klinostat was **not** rotating:
- (i) state the observations that would be made on the seedlings after three days; (2 marks)
- (ii) explain the observations in (b) (i) above. (3 marks)
- (c) If the experiment was repeated with the Klinostat rotating:
- (i) state the observation that was made on the seedlings after three days; (1 mark)
- (ii) give a reason for the observation made on the seedlings. (1 mark)

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**SECTION B (40 marks)**

Answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8.

6 The graph below shows the relative numbers of three main species of organisms in a pond.



(a) Giving a reason for your answer, which of the species is a

(i) producer? ..... (1 mark)

Reason ..... (1 mark)

(ii) secondary consumer? ..... (1 mark)

Reason ..... (1 mark)

(b) State the depths at which each of the populations labelled L, M and N is at its optimum.

L ..... (1 mark)

M ..... (1 mark)

N ..... (1 mark)

- (c) (i) Which method may have been used to determine the population of organisms labelled **N** in the pond? (1 mark)
- (ii) Give a reason for your answer in (c) (i) above. (1 mark)
- (iii) State the assumptions made when using the method in (c) (i) above. (4 marks)
- (d) State **two** reasons why primary productivity in the pond decreases with depth. (2 marks)
- (e) Explain the ecological importance of fungi to plants. (2 marks)
- (f) Why is flooding likely to lead to a cholera outbreak? (3 marks)
- 7 Explain the various ways in which seeds and fruits are adapted to dispersal. (20 marks)
- 8 How is a mammalian heart structurally adapted to its function? (20 marks)

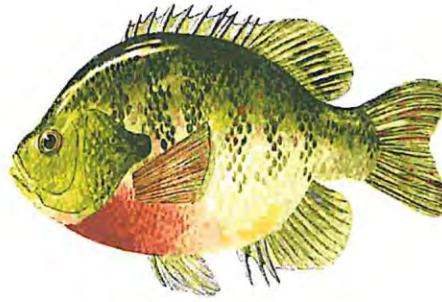
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3.5.3 Biology Paper 3 (231/3)

1 Using the pictures of animals provided below, complete the construction of the dichotomous key by filling the blank spaces. (13 marks)



Eagle



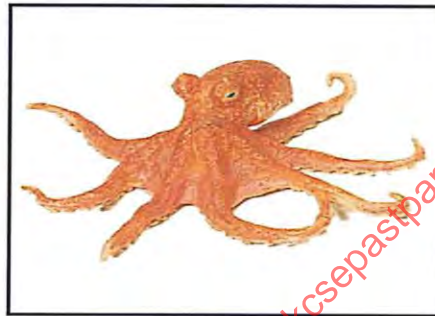
Fish



Earthworm



Tortoise



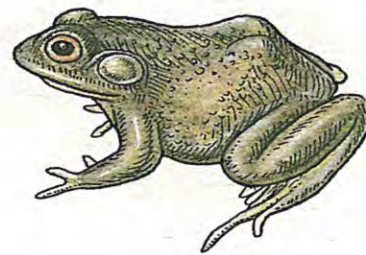
Octopus



Starfish



Spider



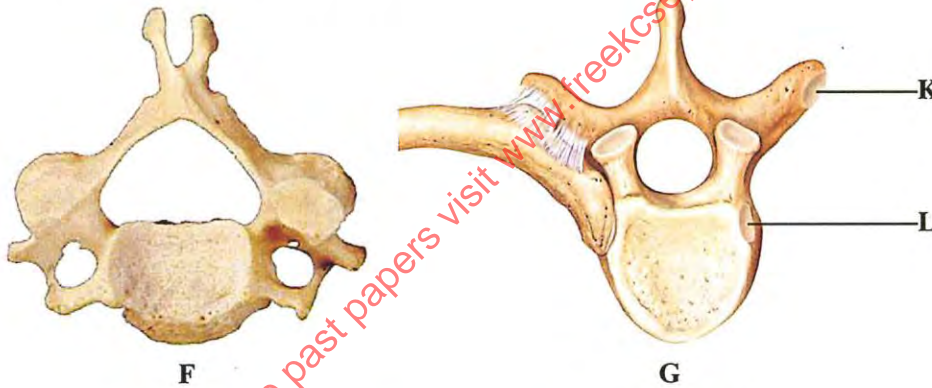
Frog

- |    |     |  |                |
|----|-----|--|----------------|
| 1. | (a) | Animals with a backbone .....                  | <b>go to 2</b> |
|    | (b) | Animals without a backbone .....               | _____          |
| 2. | (a) | Animals with wings .....                       | _____          |
|    | (b) | Animals without wings .....                    | _____          |
| 3. | (a) | Animals which live in water all the time ..... | _____          |
|    | (b) | Animals which live in water some time .....    | _____          |
| 4. | (a) | Animals with scales .....                      | _____          |
|    | (b) | Animals without scales .....                   | _____          |



5. (a) Animals with legs ..... \_\_\_\_\_  
 (b) Animals without legs ..... **go to 7**
6. (a) Animals with six legs ..... **Butterfly**  
 (b) Animals with eight legs ..... \_\_\_\_\_
7. (a) Animals with a shell ..... **Snail**  
 (b) Animals without a shell ..... \_\_\_\_\_
8. (a) Animals with a jelly-like body ..... \_\_\_\_\_  
 (b) Animals without a jelly-like body ..... \_\_\_\_\_
9. (a) Animals with a segmented body ..... \_\_\_\_\_  
 (b) Animals without a segmented body ..... **Octopus**

2 Below are pictures of three mammalian vertebrae.



H

- (a) Identify the type of vertebra labelled
- F** ..... (1 mark)
- G** ..... (1 mark)
- H** ..... (1 mark)
- (b) Label **five** parts of the vertebra labelled **H**. (5 marks)
- (c) Name the articular facets labelled **K** and **L**.
- K** ..... (1 mark)
- L** ..... (1 mark)
- (d) How does each of the parts of a vertebra enable a mammalian skeleton to carry out its functions? (4 marks)

3 You are provided with a 250 ml beaker, four test tubes, solutions labelled **D** and **E**, iodine and Benedict's solutions.

Half fill the beaker with the hot water provided to create a hot water bath.

- (I) Label the four test tubes as follows:
- (i) test tube 1, **D+Iodine**
- (ii) test tube 2, **D+E+Iodine**
- (iii) test tube 3, **D+Benedict's solution**
- (iv) test tube 4, **D+E+Benedict's solution**
- (II) Put 1 cm<sup>3</sup> of solution **D** in each of the four test tubes.
- (III) To the **D+Iodine** test tube, add one drop of iodine solution and shake to mix.
- (IV) To the **D+E+Iodine** test tube, add 1 cm<sup>3</sup> of solution **E** and two drops of iodine solution. Shake to mix.
- (V) To the **D+Benedict's solution** test tube, add 1 cm<sup>3</sup> of Benedict's solution and shake to mix.
- (VI) To the **D+E+Benedict's solution** test tube, add 1 cm<sup>3</sup> of solution **E** and 1 cm<sup>3</sup> of Benedict's solution. Shake to mix.
- (VII) Observe the changes in each of the four test tubes.
- (VIII) Put all the four test tubes in the hot water bath and observe carefully for about five minutes.

- (a) Record the observations and conclusion for each of the four test tubes in the table below. (8 marks)

NO	TEST TUBE	OBSERVATION	CONCLUSION
1	D+Iodine		
2	D+E+Iodine		
3	D+Benedict's solution		
4	D+E+Benedict's solution		

- (b) What was the role of each of the following in the experiment?
- (i) solution **E** (1 mark)
  - (ii) hot water bath. (1 mark)
- (c) Give the identity of **E** in human beings. (1 mark)
- (d) Explain the observations made on the reagents tested with Benedict's solution. (2 marks)

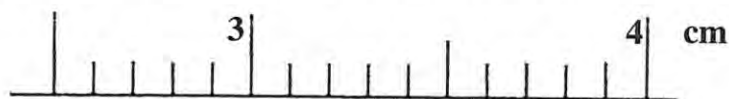
3.6 PHYSICS (232)

3.6.1 Physics Paper 1 (232/1)

SECTION A: (25 marks)

Answer ALL the questions in this section in the spaces provided.

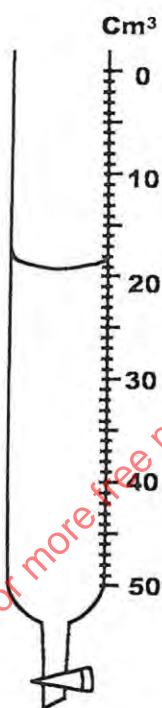
- 1 **Figure 1** shows part of the main scale of a vernier callipers.



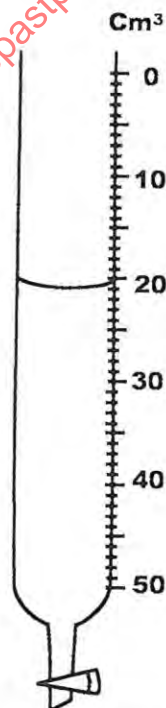
**Figure 1**

Insert the vernier scale to the main scale, to show a reading of 3.14 cm. (1 mark)

- 2 **Figure 2 (a)** shows the initial reading of a burette used to measure the volume of oil. After 50 drops of the oil were run out, the final reading was as shown in **Figure 2 (b)**



**Figure 2 (a)**



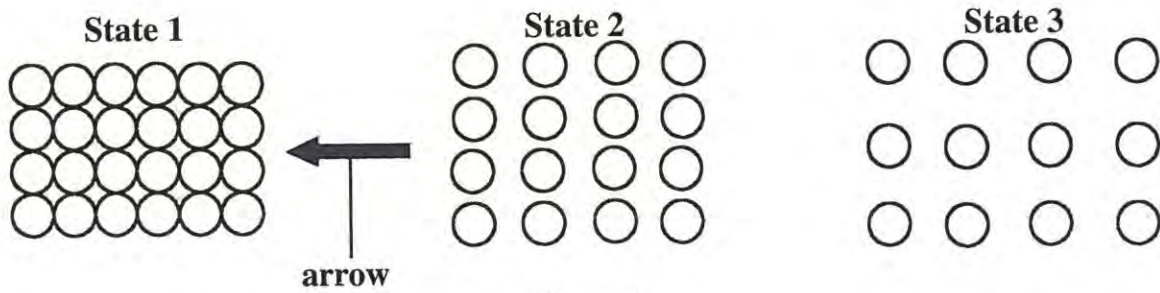
**Figure 2 (b)**

Determine the volume of one drop of oil. (2 marks)

- 3 A spring extends by 6 cm when supporting a mass of 0.06 kg on earth. When the spring is used to support the same mass on the moon, it extends by 1 cm. Determine the moon's gravitational strength. (Take gravitational field strength on earth as  $10 \text{ Nkg}^{-1}$ ) (3 marks)
- 4 State **two** factors that determine the pressure at a point in a liquid. (2 marks)

5 A student wearing sharp pointed heeled shoes is likely to damage a soft wooden floor. Explain. (2 marks)

6 **Figure 3** shows the arrangement of molecules in the three states of matter.



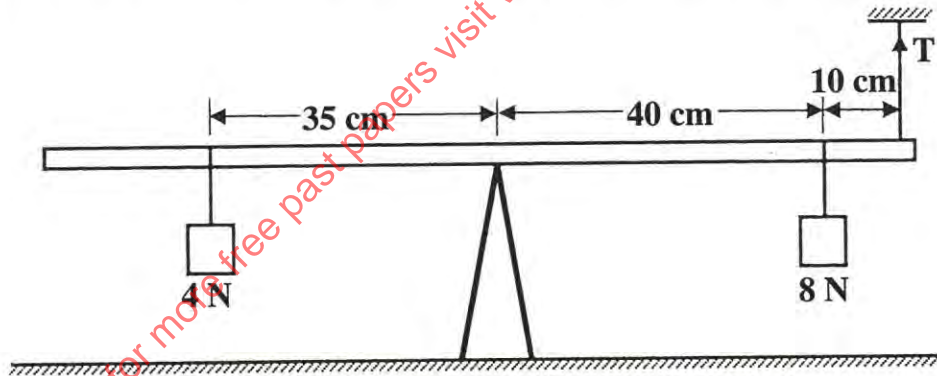
**Figure 3**

(a) Name the process represented by the arrow. (1 mark)

(b) State the reason for the arrangement of molecules in state 3. (1 mark)

7 Two containers **A** and **B** of equal dimensions but different metals are fitted with identical glass casings. The two containers initially at the same temperature are simultaneously filled with boiling water. It is observed that the glass casing on **A** breaks earlier than the one on **B**. Explain this observation. (2 marks)

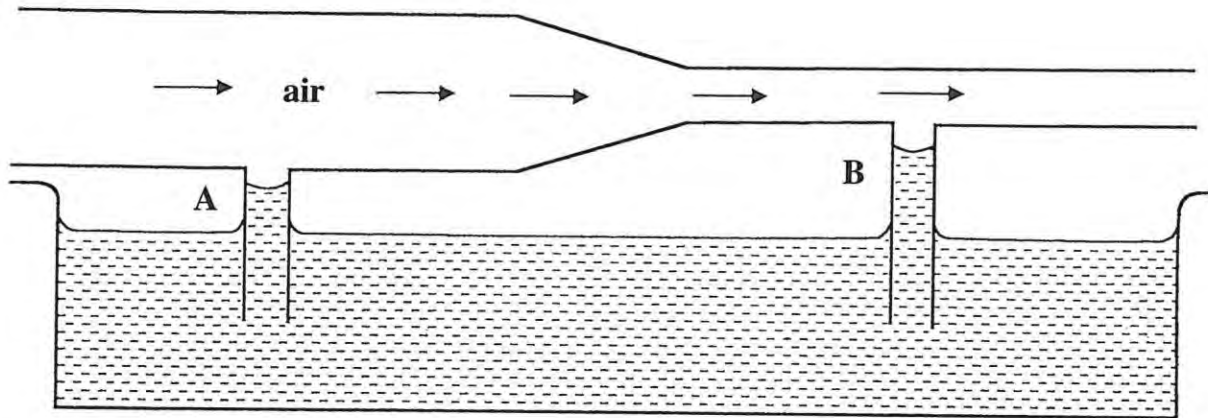
8 **Figure 4** shows a uniform metal rod balanced at its centre by different forces.



**Figure 4**

Determine the value of  $T$ . (3 marks)

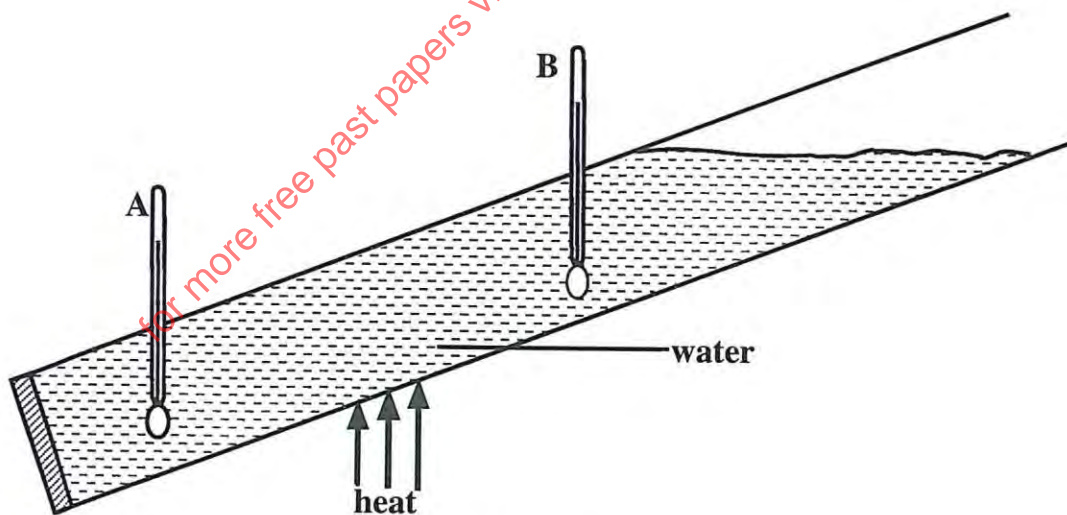
- 9 **Figure 5** shows air flowing through a pipe of different cross-sectional areas. Two pipes **A** and **B** are dipped into water.



**Figure 5**

Explain the cause of the difference in the levels of water in the pipes **A** and **B**. (2 marks)

- 10 A balloon is filled with hydrogen gas and then released into the air. It is observed that as it rises higher into the air it expands. Explain why it expands. (2 marks)
- 11 A person carrying a heavy luggage using one hand leans away from the luggage. State the reason for this. (1 mark)
- 12 **Figure 6** shows a glass tube with water fitted with two identical thermometers **A** and **B**. It is heated as shown.



**Figure 6**

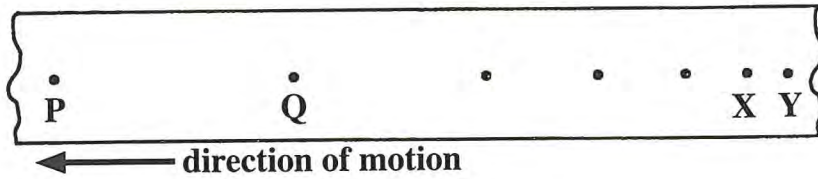
State with a reason which one of the two thermometers shows a higher temperature. (2 marks)

- 13 Mechanics is one of the branches of physics. State what it deals with. (1 mark)

**SECTION B: (55 marks)**

Answer *ALL* the questions in this section in the spaces provided.

- 14 (a) **Figure 7** (drawn to scale) shows a section of tape after passing through a ticker timer operated at a frequency of 50 Hz. The tape is attached to a trolley moving in the direction shown.

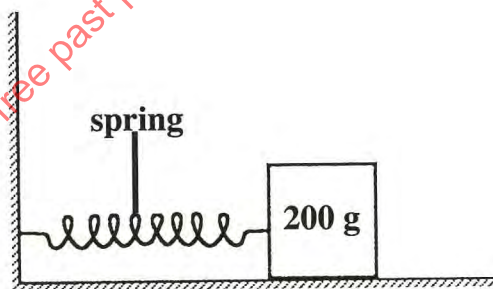


**Figure 7**

- (i) Determine the velocity between:
- (I) P and Q; (4 marks)
- (II) X and Y. (2 marks)
- (ii) Determine the acceleration of the trolley. (3 marks)

- (b) Two bodies of masses 5 kg and 8 kg moving in the same direction with velocities  $20 \text{ ms}^{-1}$  and  $15 \text{ ms}^{-1}$  respectively collide inelastically. Determine the velocity of the bodies after the collision. (4 marks)

- 15 (a) **Figure 8** shows a 200 g mass placed on a frictionless surface and attached to a spring.

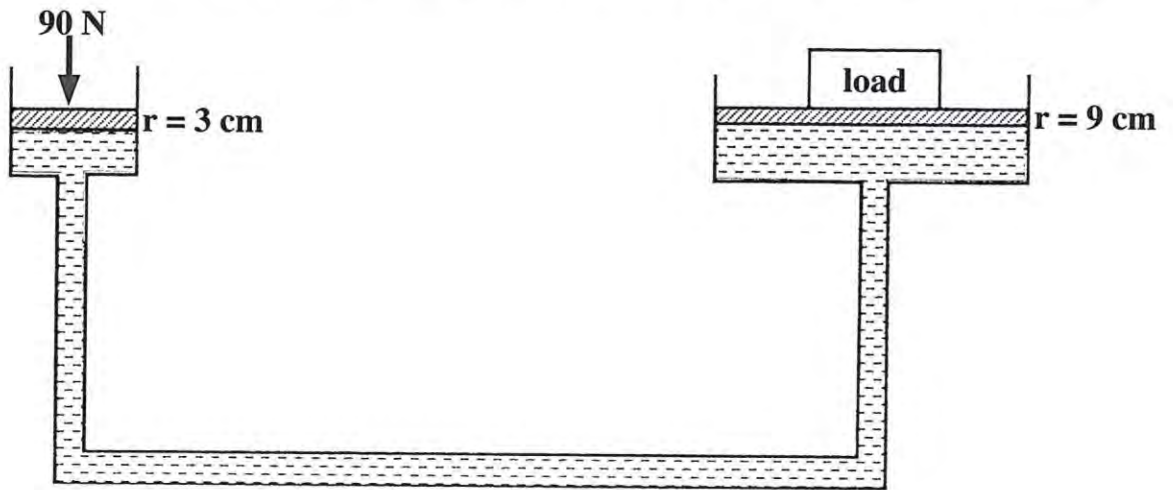


**Figure 8**

The spring is compressed and released. Given that the elastic potential energy of the compressed spring is  $2.7 \times 10^{-2} \text{ J}$ , determine the maximum speed with which the block moves after it is released. (4 marks)

- (b) In a wheel and axle system, state the advantage of having a large wheel diameter compared to the axle diameter for a frictionless system. (1 mark)
- (c) A body is released from a height  $h$ . Sketch a graph of potential energy against kinetic energy as the body falls to the ground. (2 marks)

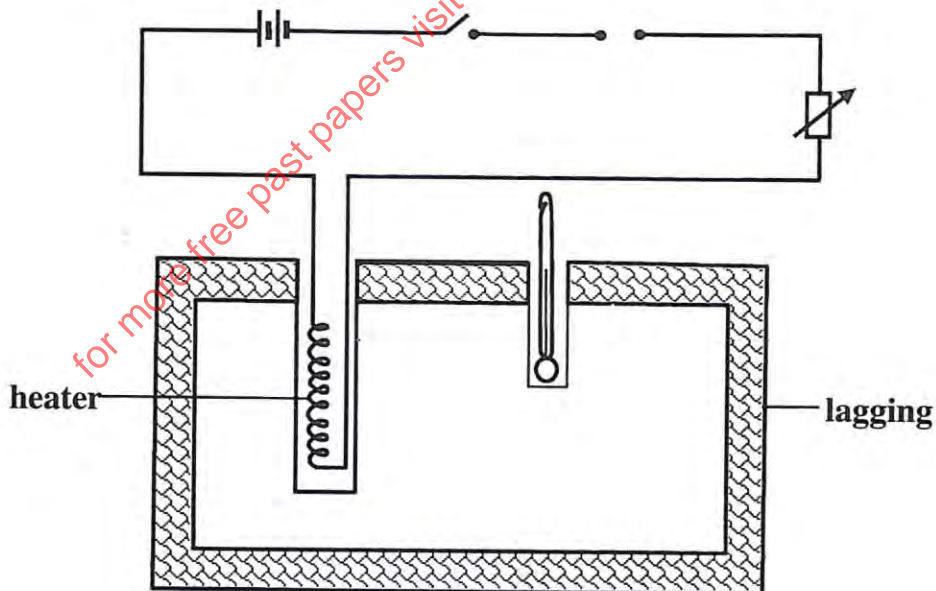
- (d) **Figure 9** shows a hydraulic lift system. The radius of the small piston is 3 cm while that of the larger piston is 9 cm. A force of 90 N is applied to the smaller piston.



**Figure 9**

Determine the:

- (i) maximum load that can be lifted. (3 marks)
- (ii) efficiency of the system. (3 marks)
- 16 (a) **Figure 10** shows an **incomplete** set up that can be used in an experiment to determine the specific heat capacity of a solid of mass **m** by electrical method.



**Figure 10**

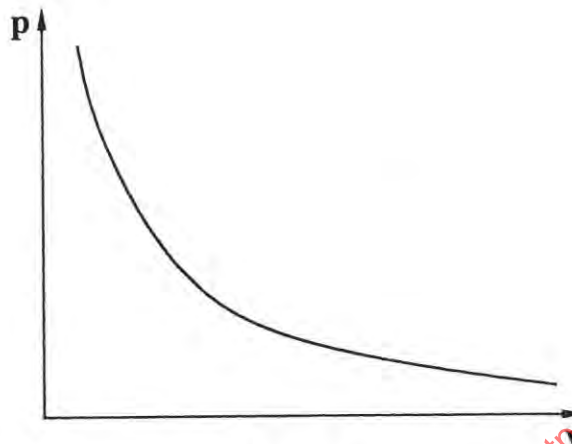
- (i) Complete the diagram by inserting the missing components for the experiment to work. (2 marks)
- (ii) Other than temperature, state **three** measurements that should be taken. (3 marks)



(iii) The final temperature was recorded as  $\theta$ . Write an expression that can be used to determine the specific heat capacity of the solid. (2 marks)

(b) State **three** ways of increasing the sensitivity of a liquid-in-glass thermometer. (3 marks)

17 (a) **Figure 11** shows a graph of pressure ( $p$ ) against volume ( $v$ ) for a fixed mass of a gas at constant temperature.



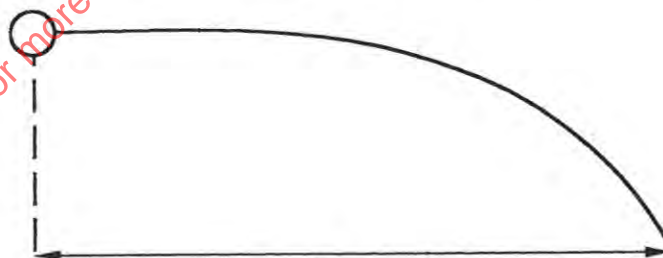
**Figure 11**

In the space provided, sketch the corresponding graph of  $p$  against  $\frac{1}{v}$ . (1 mark)

(b) Explain the pressure law using the kinetic theory of gases. (3 marks)

(c) 20 cm<sup>3</sup> of a gas exerts a pressure of 760 mmHg at 25°C. Determine the temperature of the gas when the pressure increases to 900 mmHg and the volume reduces to 15 cm<sup>3</sup>. (4 marks)

(d) **Figure 12** shows the path of a light ball projected horizontally.



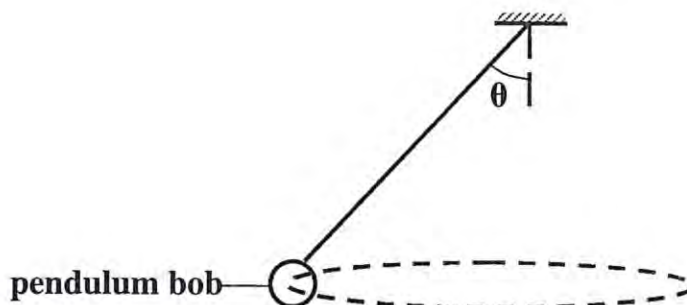
**Figure 12**

The ball is then made to spin in an anticlockwise direction as it moves:

(i) on the same axis, sketch the new path of the ball. (1 mark)

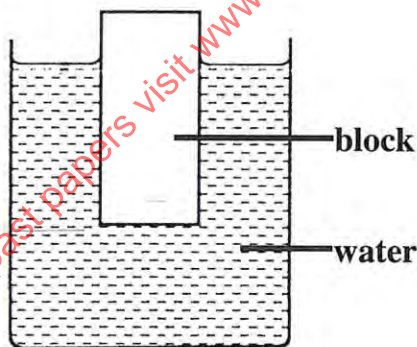
(ii) explain how the ball attains the new path. (2 marks)

- 18 (a) **Figure 13** shows a pendulum bob suspended by a thread moving in a horizontal circle.



**Figure 13**

- (i) Name **two** forces acting on the pendulum bob as it moves. (2 marks)
- (ii) State what happens to each of the forces when the angular velocity of the pendulum bob is increased. (2 marks)
- (iii) State **two** applications of uniform circular motion in daily life. (2 marks)
- (b) **Figure 14** shows a block floating in water.



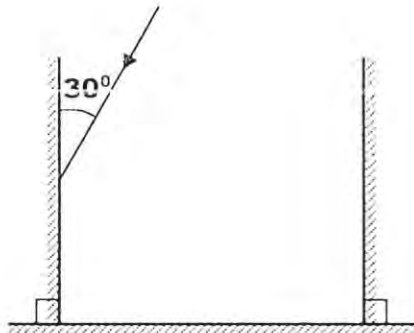
**Figure 14**

When the water is heated; it is observed that the block sinks further. Explain this observation. (2 marks)

## SECTION A: (25 marks)

Answer *all* the questions in this section in the spaces provided.

- 1 **Figure 1** shows three mirrors arranged at right angles to each other. A ray of light is incident on one of the mirrors.

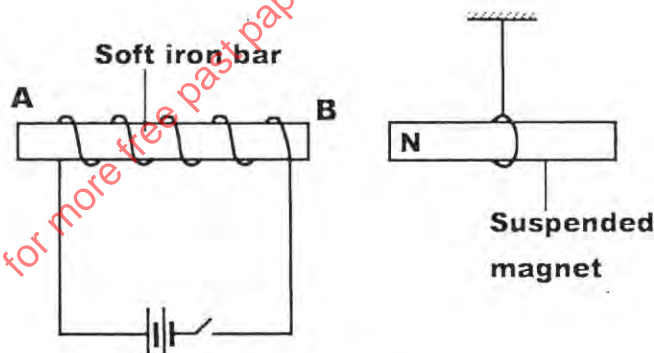


**Figure 1**

Complete the diagram to show the path of the ray after reflection on each of the mirrors.

(3 marks)

- 2 It is observed that when a charged body is brought near the cap of a positively charged electroscope, the divergence of the leaf increases. State the type of charge on the body. (1 mark)
- 3 State the reason for topping up a lead - acid accumulator with distilled water. (1 mark)
- 4 **Figure 2** shows a soft iron bar **AB** placed in a coil near a freely suspended magnet.



**Figure 2**

Explain the observation made when the switch is closed. (2 marks)

- 5 State the reason why a convex mirror is preferred over a plane mirror for use as a driving mirror. (1 mark)
- 6 State **two** ways in which the strength of an electromagnet can be increased. (2 marks)
- 7 State **two** differences between electromagnetic waves and mechanical waves. (2 marks)
- 8 **Figure 3** shows straight waves incident on a diverging lens placed in a ripple tank to reduce its depth.

Complete the diagram to show the waves in both the shallow region and beyond the lens.

(2 marks)

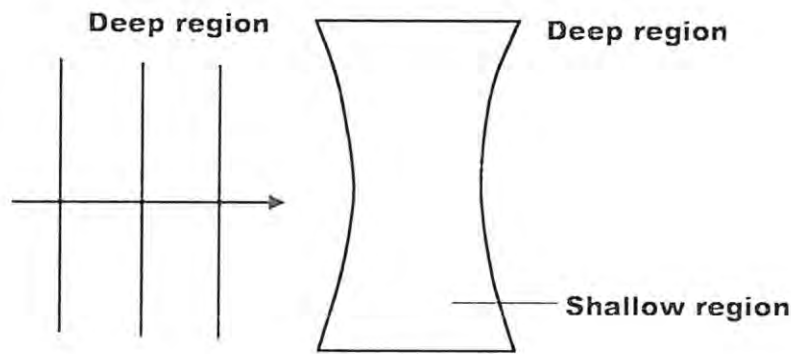


Figure 3

- 9 A ship in an ocean sends out an ultra sound whose echo is received after 3 seconds. If the wavelength of the ultra sound in water is 7.5 cm, and the frequency of the transmitter is 20 kHz, determine the depth of the ocean. (3 marks)
- 10 A nail at the bottom of a beaker containing glycerine appears to be 6.8 cm below the surface of glycerine. Determine the height of the column of glycerine in the beaker. (take the refractive index of glycerine as 1.47) (3 marks)
- 11 State **one** application of thermionic emission. (1 mark)
- 12 **Figure 4** shows a cathode ray entering into a region between two charged plates.

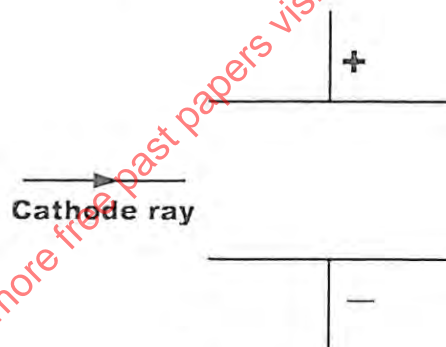


Figure 4

Complete the diagram to show the path of the ray in the field.

(1 mark)

- 13 When a transformer is connected to an ac source, the output voltage is found to be 24 V. If the power input is 200 W, determine the output current. (Assume the transformer is 100% efficient). (3 marks)

**SECTION B: (55 marks)**

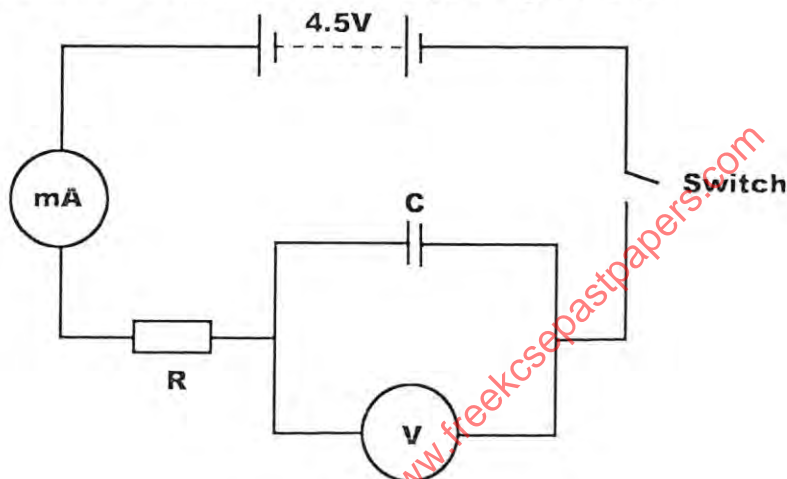
Answer *all* the questions in this section in the spaces provided.

- 14** (a) State **two** factors that affect photoelectric emission. (2 marks)
- (b) Light of wavelength  $4.3 \times 10^{-7}\text{m}$  is incident on two different metal surfaces, nickel and potassium. (Take speed of light as  $3.0 \times 10^8 \text{ms}^{-1}$  and planks constant  $h$  as  $6.63 \times 10^{-34}\text{Js}$ ).
- (i) Determine the energy of the incident radiation. (3 marks)
- (ii) If the work function of nickel is  $8.0 \times 10^{-19}\text{J}$  and that of potassium is  $3.68 \times 10^{-19}\text{J}$ , state with a reason from which of the two metals the given light will eject electrons. (2 marks)
- (iii) Determine the velocity of the emitted electrons from the metal surface in b(ii). (Take the mass of an electron as  $9.1 \times 10^{-31} \text{kg}$ ). (3 marks)
- 15** (a) State **two** factors that determine the resistance of a metallic conductor. (2 marks)
- (b) Explain how a fuse safeguards electrical appliances against excessive currents. (2 marks)
- (c) A hair dryer is rated 2.5 kW, 240 V.
- (i) Determine whether a 10 A fuse may be suitable for the hair dryer. (3 marks)
- (ii) Determine the cost of using the hair dryer for 3 hours if the cost of electricity is Ksh 0.80 per kilowatt hour. (2 marks)
- 16** (a) It is observed that alpha ( $\alpha$ ) particles have a lower penetrating power than beta ( $\beta$ ) particles. Explain this observation. (2 marks)
- (b) A radioactive substance has a half life of 12 years. Determine the time it would take to decay to 12.5% of its original value. (2 marks)
- (c) A Geiger Mülller (GM) tube is used for detecting radiations from a radioactive source. State the function of:
- (i) the mica window; (1 mark)
- (ii) bromine gas in the tube. (1 mark)

- (d) (i) In a diffusion chamber, explain why some of the tracks formed are observed to be;
- (I) Short, (2 marks)
- (II) Straight. (2 marks)
- (ii) State **two** advantages of using a GM tube instead of a diffusion cloud chamber to detect radiations from radioactive substances. (2 marks)

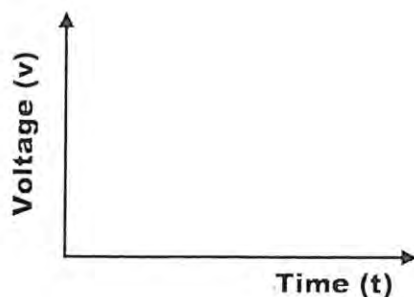
- 17 (a) State **three** factors that affect the capacitance of a parallel plate capacitor. (3 marks)

- (b) **Figure 5** shows the circuit used to charge a capacitor C.



**Figure 5**

- (i) State what would be observed on the following when the switch is closed:
- (I) the milliammeter; (1 mark)
- (II) the voltmeter; (1 mark)
- (ii) Explain how the capacitor gets charged. (3 marks)
- (iii) State the purpose of the resistor R. (1 mark)
- (iv) On the axes provided, sketch the graph of voltage (V) against time (t). (2 marks)



- 18 (a) Three resistors of resistance  $2\ \Omega$ ,  $3\ \Omega$  and  $4\ \Omega$  are to be connected to a cell such that they have the least effective resistance.
- (i) Draw a circuit diagram to show how they can be connected to achieve this. (2 marks)
- (ii) Determine the least effective resistance of the three resistors. (3 marks)
- (b) A real object of height 1 cm placed 50 mm from a converging lens forms a virtual image 100 mm from the lens.
- (i) Determine the:
- (I) focal length of the lens; (3 marks)
- (II) magnification. (2 marks)
- (ii) On the grid provided draw to scale the ray diagram for the set up, to show how the image is formed. (3 marks)

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### 3.6.3 Physics Paper 3 (232/3)

#### Question one

You are provided with the following:

- a micrometer screw gauge (to be shared)
- a vernier calliper (to be shared)
- glass tube
- a wire labelled **M**
- some sellotape
- one 50 g mass
- some masses (totalling 40 g)
- a meter rule
- 100 ml beaker
- a stand boss and clamp
- a stop watch
- a source of light
- a screen
- some water
- a measuring cylinder

#### PART A

Proceed as follows:

- (a) Using a micrometer screw gauge, measure and record the diameter of the wire labelled **M**. (1 mark)

**d** = ..... mm

**d** = ..... m.

- (b) Using wire **M**, make a spring as follows:

- Use some sellotape to fix one end of the wire **M** (about 2.5 cm) along the glass tube;
- Hold firmly the part of the wire under the tape with one hand. Use the other hand to wind 30 turns as closely and tightly as possible. (see *figure 1*)

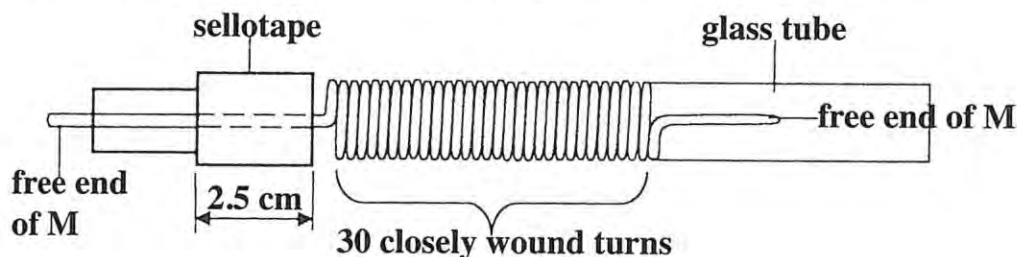
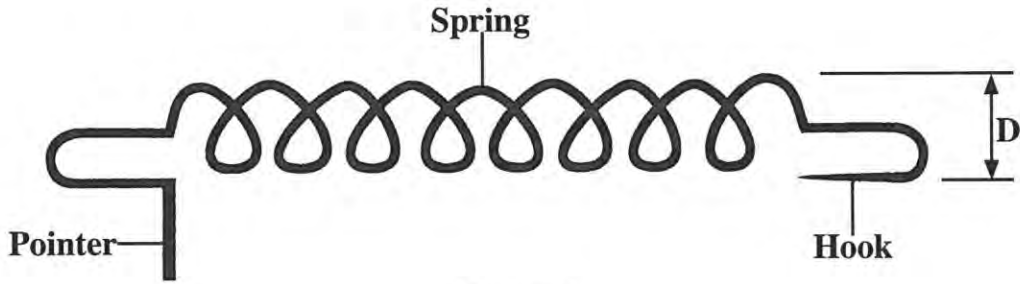


Figure 1



- (c) Remove the sellotape and release the spring from the tube.  
*(The spring will slightly unwind and some turns will disappear)*  
 Bend the free ends as shown in **figure 2**.



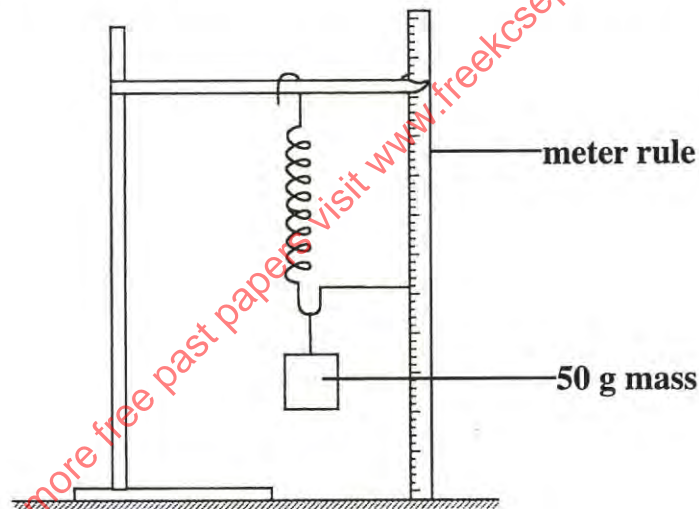
**Figure 2**

- (d) Using a vernier callipers, measure and record the external diameter **D** of the spring. (1 mark)

**D** = ..... cm

**D** = ..... m.

- (e) Suspend the spring and a 50 g mass from a retort stand as shown in **figure 3**.



**Figure 3**

- Count and record the number of turns **N** of the suspended spring. (1 mark)

**N** = .....

- (f) Add 40 g to the 50 g mass and record the extension **X** of the spring due to the 40 g. (1 mark)

**X** = ..... cm

**X** = ..... m

- (g) Determine  $c$  given that (1 mark)

$$c = \frac{0.4}{X}$$

- (h) Determine  $n$  given that (2 marks)

$$c = \frac{nd^4}{8ND^3}$$

- (i) With the spring still loaded with the 90 g, pull the lower mass slightly downwards and let go so that the mass oscillates vertically. Record the time  $t$  for 20 oscillations. Hence determine the period  $T$ .

$t = \dots\dots\dots$  (s) (1 mark)

$T = \dots\dots\dots$  (s) (1 mark)

- (j) Determine  $Z$  given that

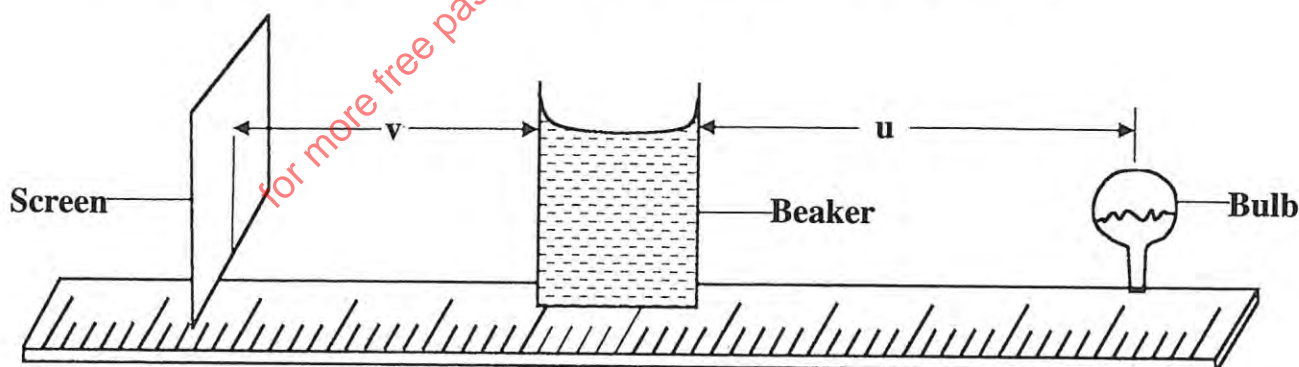
$$T = 2\pi\sqrt{\frac{m}{Z}}$$

where  $m$  is the mass in kg on the spring. (2 marks)

**PART B**

Proceed as follows:

- (k) Place the 100 ml beaker on a meter rule and pour 80 cm<sup>3</sup> of water into it. Arrange a lamp (source of light) and a screen on either side of the beaker. (see **figure 4**)



**Figure 4**

- (l) Adjust the position of the lamp on the metre rule so that its centre is a distance  $u = 12$  cm from the beaker. Switch on the light. Adjust the position of the screen until a well focused vertical line (*the image of filament*) is formed on the screen. Measure and record in **table 1** the image distance  $V$  between the screen and the beaker.

- (m) Repeat part (l) for other values of **u** shown in **table 1** and complete the table.

**Table 1**

<b>Distance u (cm)</b>	<b>12</b>	<b>16</b>	<b>20</b>
<b>Distance V (cm)</b>			
$y = \frac{uv}{u+v}$			

(4 marks)

- (o) (i) With the meter rule outside the beaker, measure the height **h** of the water meniscus above the bench. (1 mark)

**h** = ..... cm

- (ii) Determine the value of **P** given that (1 mark)

$$P = \frac{5}{\sqrt{h}}$$

- (iii) Hence determine the value of **f** given that  $f = \frac{P}{2m} + 1$  to one decimal place. (2 marks)

### Question two

You are provided with the following:

- an ammeter
- a voltmeter
- two cells (size D)
- a cell holder
- a switch
- a wire labelled **L** mounted on a millimetre scale
- a micrometer screw gauge (to be shared)
- six connecting wires at least four with crocodile clips

Proceed as follows:

- (a) Using a micrometer screw gauge, measure and record the diameter **d** of the wire **L**. (1 mark)

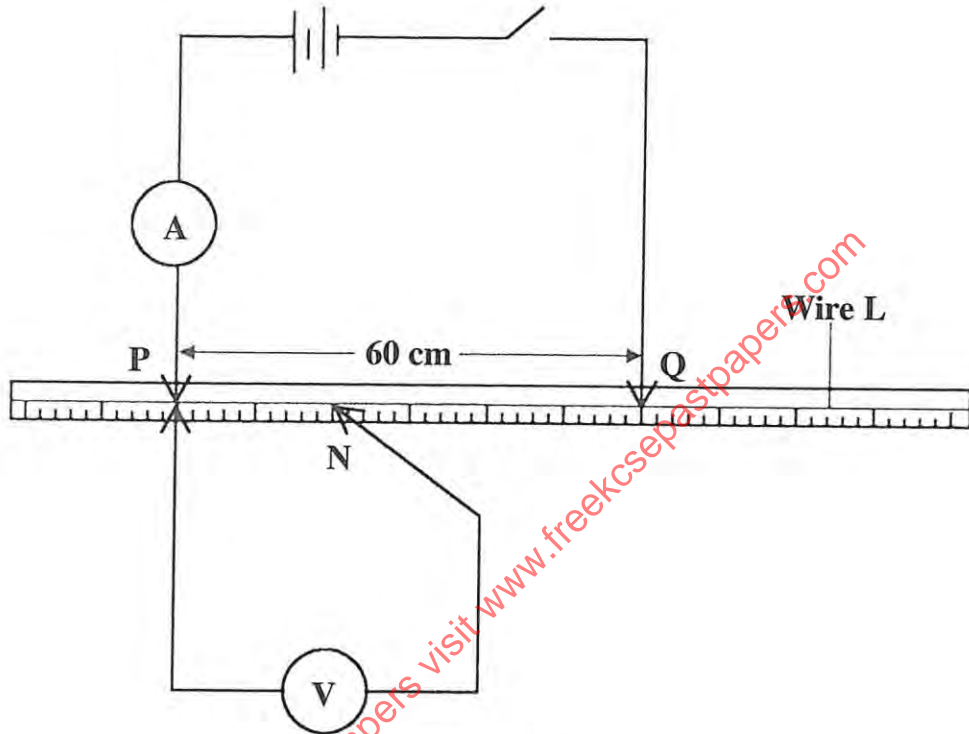
**d** = ..... mm

**d** = ..... m.

- (b) Place the two cells **in series** in the cell holder and use the voltmeter to measure the total electromotive force (emf)  $E_0$  of the battery. (1 mark)

$E_0 = \dots\dots\dots$  V.

- c) Starting with the switch open, connect the circuit as shown in **figure 5**. P and Q are points on the wire L such that PQ is 60 cm. (PQ should remain 60 cm throughout the experiment) N is a point on the wire such that PN is 10 cm (0.1 m).



**Figure 5**

- (d) (i) Close the switch and record the current I. (1 mark)

$I = \dots\dots\dots$  A.

- (ii) Measure and record in **table 2** the potential difference across **PN**.
- (iii) Measure and record the potential difference across **PN** for the other values of **PN** shown in **table 2** and complete the table. (The current is expected to remain constant) Hint: The switch should be closed only when reading the voltmeter.

**Table 2**

Length PN (m)	0.1	0.2	0.3	0.4	0.5	0.6
p.d (V)						
Resistance $\left(\frac{V}{I}\right) \Omega$						

(6 marks)

(e) On the grid provided, plot a graph of resistance (y-axis) against length. (3 marks)

(f) From the graph, determine:

(i) the slope **S** and its units. (3 marks)

(ii) the constant **k** and its units given that

$$S = \frac{4k}{\pi d^2} \quad (3 \text{ marks})$$

(g) Determine constant **t** given that

$$t = \frac{E_0 - V_n}{I}$$

where  $V_n$  is the p.d at PN = 0.6 m.

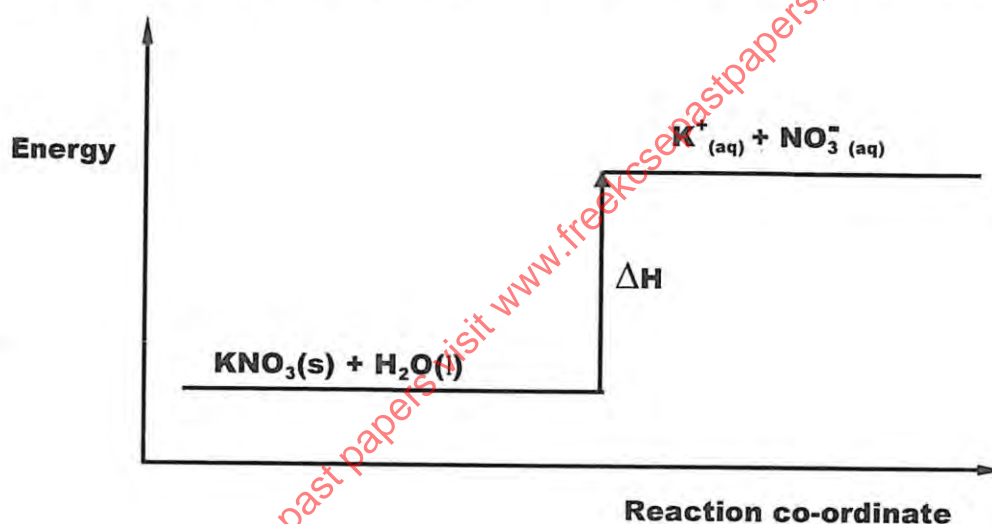
(2 marks)

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### 3.7 CHEMISTRY (233)

#### 3.7.1 Chemistry Paper 1 (233/1)

- 1 (a) Give the name of the first member of the alkene homologous series. (1 mark)
- (b) Describe a chemical test that can be used to distinguish butanol from butanoic acid. (2 marks)
- 2 (a) Name the raw material from which sodium is extracted. (1 mark)
- (b) Give a reason why sodium is extracted using electrolysis. (1 mark)
- (c) Give **two** uses of sodium metal. (1 mark)
- 3 (a) What is meant by lattice energy? (1 mark)
- (b) Study the energy level diagram below and answer the question that follows:



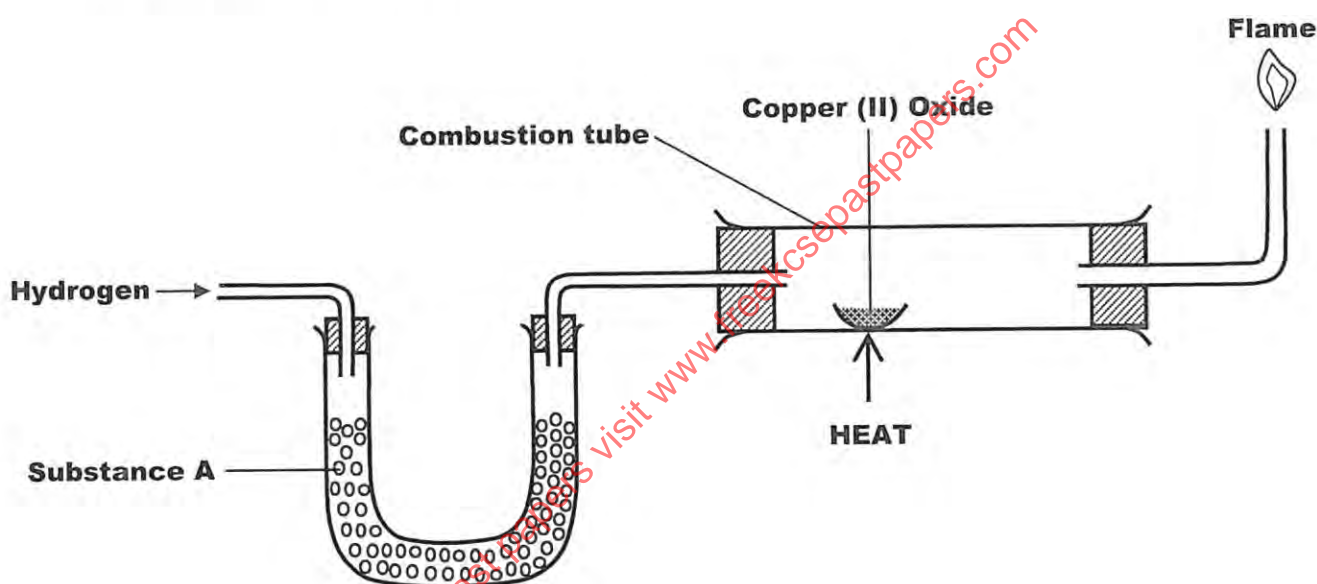
- What type of reaction is represented by the diagram? (1 mark)
- 4 (a) State Boyle's law. (1 mark)
- (b) A gas occupies  $500 \text{ cm}^3$  at  $27^\circ\text{C}$  and  $100,000 \text{ Pa}$ . What will be its volume at  $0^\circ\text{C}$  and  $101325 \text{ Pa}$ ? (2 marks)
- 5 Calculate the mass of Zinc oxide that will just neutralise dilute nitric (V) acid containing  $12.6 \text{ g}$  of nitric (V) acid in water. ( $Z_{\text{n}} = 65.0$ ;  $\text{O} = 16.0$ ,  $\text{H} = 1.0$ ,  $\text{N} = 14.0$ ). (3 marks)
- 6 Describe how sodium carbonate is used to remove water hardness. (2 marks)
- 7 Hydrogen chloride gas can be prepared by reacting sodium chloride with an acid.
- (a) Write an equation for the reaction between sodium chloride and the acid. (1 mark)

- (b) Give **two** chemical properties of hydrogen chloride gas. (1 mark)
- (c) State **two** uses of hydrogen chloride gas. (1 mark)

8 When solid A was heated strongly, it gave off water and a solid residue. When water was added to the solid residue, the original solid A, was formed .

- (a) What name is given to the process described? (1 mark)
- (b) Give **one** example of solid A. (1 mark)

9 The set up below was used to investigate the reaction between dry hydrogen gas and copper (II) oxide.



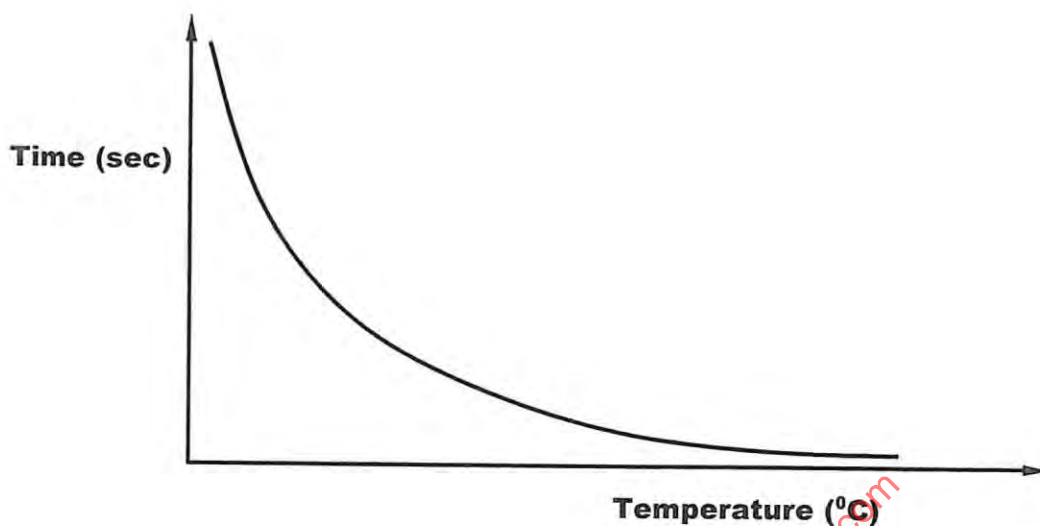
- (a) Name substance A. (1 mark)
- (b) State the observation made in the combustion tube. (1 mark)
- (c) Explain the observation stated in (b) above. (1 mark)

10 The atomic number of an element, T is 15.

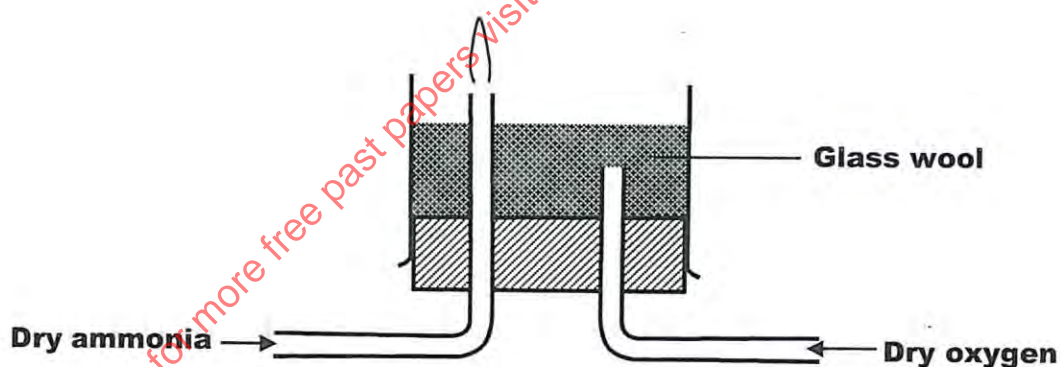
- (a) Write the electronic configuration of the ion  $T^{3-}$ . (1 mark)
- (b) Write the formula of an oxide of T. (1 mark)

11 Dilute sulphuric (VI) acid was electrolysed using platinum electrodes. Name the product formed at the anode and give a reason for your answer. (2 marks)

- 12 The curve shown below shows the variation of time against temperature for the reaction between sodium thiosulphate and hydrochloric acid.



- (a) Write the equation for the reaction between sodium thiosulphate and dilute hydrochloric acid. (1 mark)
- (b) Explain the shape of the curve. (2 marks)
- 13 Dry ammonia and dry oxygen were reacted as shown in the diagram below.



- (a) What is the purpose of the glass wool? (1 mark)
- (b) What products would be formed if red hot platinum was introduced into a mixture of ammonia and oxygen? (1 mark)



- 14 The table below shows behaviour of metals R, X, Y and Z. Study it and answer the questions that follow:

Metal	Appearance on exposure to air	Reaction in water	Reaction with dilute hydrochloric acid
R	slowly tarnishes	Slow	Vigorous
X	Slowly turns white	Vigorous	Violent
Y	No change	Does not react	Does not react
Z	No change	No reaction	Reacts moderately

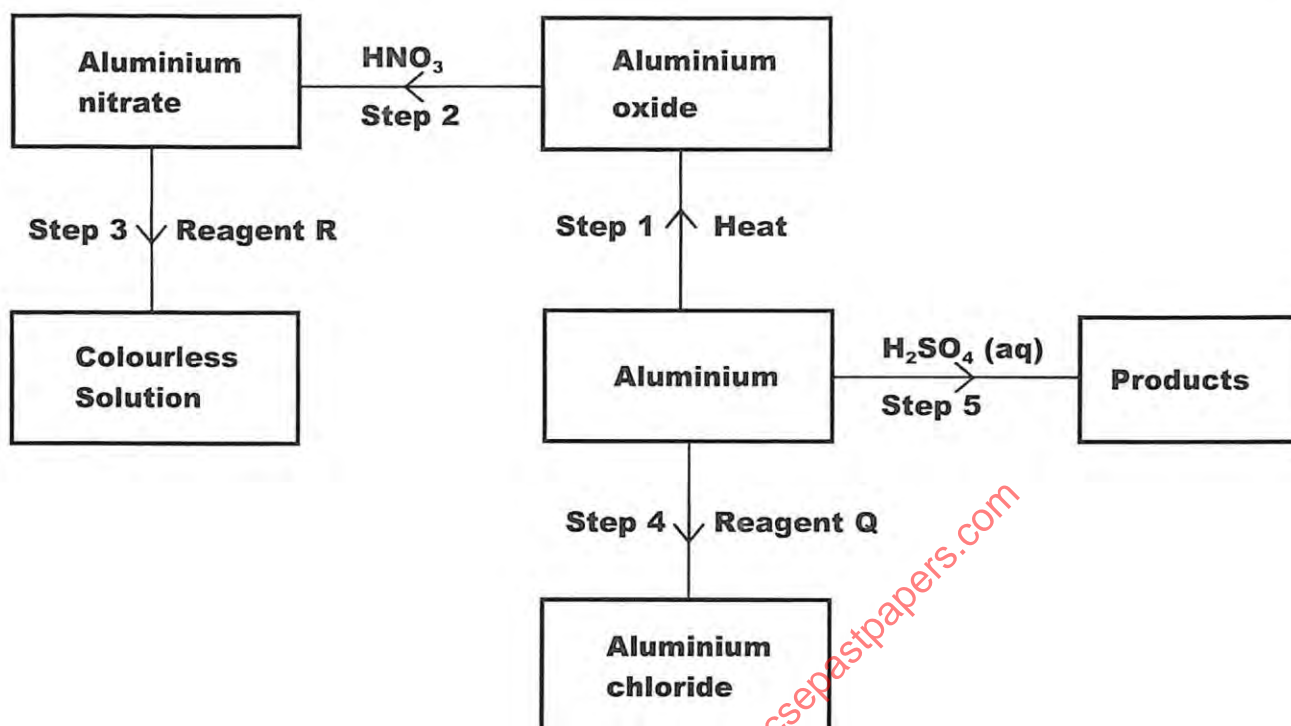
- (a) Arrange the metals in the order of reactivity starting with the most reactive. (2 marks)
- (b) Name a metal which is likely to be: (1 mark)
- (i) X
- (ii) Y

- 15 Given the following substances: wood ash, lemon juice and sodium chloride.

- (a) Name **one** commercial indicator that can be used to show whether wood ash, lemon juice and sodium chloride are acidic, basic or neutral. (1 mark)
- (b) Classify the substances in 15(a) above as acids, bases or neutral. (2 marks)

Acid	Base	Neutral

- 16 The flow chart below shows various reactions of aluminium metal. Study it and answer the questions that follow:



- (a) (i) Other than water, name another reagent that could be R. (1 mark)
- (ii) Write the formula of reagent Q. (1 mark)
- (b) Write an equation for the reaction in step 5. (1 mark)
- 17 (a) One of the allotropes of sulphur is rhombic sulphur, name the other allotrope. (1 mark)
- (b) Concentrated sulphuric (VI) acid reacts with ethanol and copper. State the property of the acid shown in each case. (2 marks)
- (i) Ethanol
- (ii) Copper
- 18 Study the standard electrode potentials in the table below and answer the questions that follow.

	$E^{\ominus}$ volts
$\text{Cu}^{2+}_{(\text{aq})} + 2\text{e} \rightarrow \text{Cu}_{(\text{s})};$	+ 0.34
$\text{Mg}^{2+}_{(\text{aq})} + 2\text{e} \rightarrow \text{Mg}_{(\text{s})};$	- 2.38
$\text{Ag}^{+}_{(\text{aq})} + \text{e} \rightarrow \text{Ag}_{(\text{s})};$	+ 0.80
$\text{Ca}^{2+}_{(\text{aq})} + 2\text{e} \rightarrow \text{Ca}_{(\text{s})};$	- 2.87

(a) Which of the metals is the strongest reducing agent? (1 mark)

(b) What observations will be made if a silver coin was dropped into an aqueous solution of copper (II) sulphate? Explain. (2 marks)

19 A radioactive substance weighing  $M$  kg took 1900 years for the original mass to reduce to 15 kg. Given that the half life of the radioactive substance is 380 years;

(a) Determine the original mass of the radioactive substance. (2 marks)

(b) State **two** uses of radioactivity in medicine. (1 mark)

20 A crystal of iodine, heated gently in a test tube gave off a purple vapour.

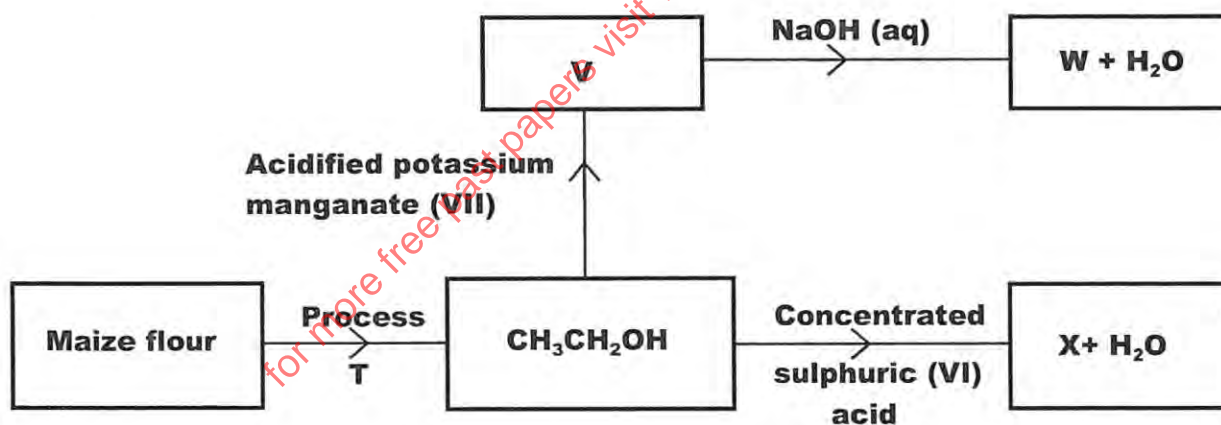
(a) Write the formula of the substance responsible for the purple vapour. (1 mark)

(b) What type of bond is broken when the iodine crystal is heated gently? (1 mark)

(c) State **one** use of iodine. (1 mark)

21 Describe how samples of lead (II) sulphate, ammonium chloride and sodium chloride can be obtained from a mixture of the three. (3 marks)

22 Study the flow chart below and use it to answer the questions that follow.



(a) Name process T. (1 mark)

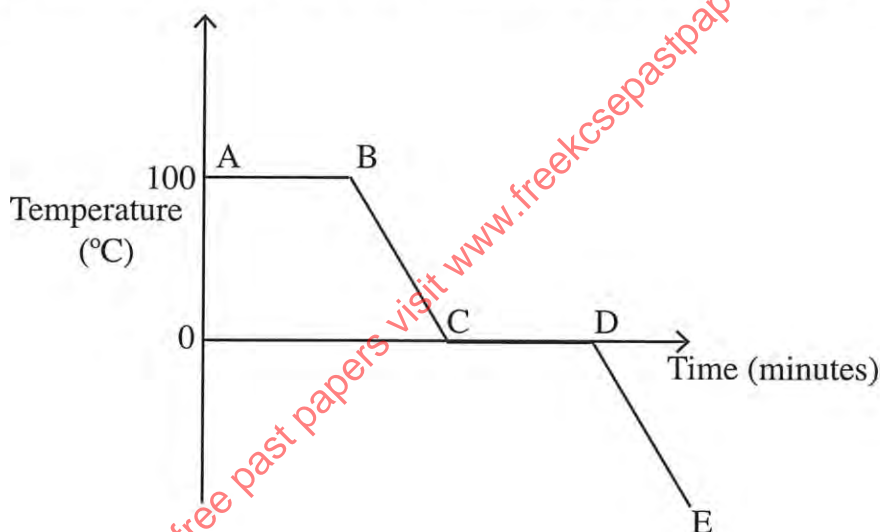
(b) Give the formula of W. (1 mark)

(c) State **two** uses of X. (1 mark)

- 23 The table below is part of the periodic table. The letters are not the actual symbols of the elements. Study it and answer the questions that follow.

					<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
<b>G</b>	<b>H</b>						<b>I</b>	

- (a) Select an element which is stored in paraffin in the laboratory. (1 mark)
- (b) How do the ionic radii of E and I compare? Explain. (2 marks)
- 24 The graph below is a cooling curve for water. Study it and answer the questions that follow.



- (a) Explain what happens to the molecules of water in the region BC in terms of kinetic theory. (2 marks)
- (b) In what state is the water in the region DE? (1 mark)
- 25 Starting with barium nitrate solution, describe how a pure sample of barium carbonate can be prepared in the laboratory. (3 marks)
- 26 A hydrocarbon contains 14.5% of hydrogen. If the molar mass of the hydrocarbon is 56, determine the molecular formula of the hydrocarbon. (C = 12.0; H = 1.0) (3 marks)
- 27 (a) Describe how carbon (IV) oxide can be distinguished from Carbon II Oxide using calcium hydroxide solution. (2 marks)

(b) What is the role of carbon (IV) oxide in fire extinguishing? (1 mark)

28 (a) State **one** source of alkanes. (1 mark)

(b) Ethane gas was reacted with 1 mole of bromine gas. State **one** observation made during this reaction. (1 mark)

29 An electric current was passed through several substances and the results obtained recorded in the table below.

Substance	Physical state at room temperature	Conductivity	Products	
			Anode	Cathode
A	Liquid	Does not conduct	-	-
B	Solid	Conducts	-	-
C	Liquid	Conducts	Green gas	Grey solid
D	Liquid	Conducts	Brown gas	Grey solid
E	Liquid	Conducts	-	-

Which of these substances is likely to be:

(a) magnesium (1 mark)

(b) hexane (1 mark)

(c) lead (II) bromide ? (1 mark)

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### 3.7.2 Chemistry Paper 2 (233/2)

- 1 (a) (i) Carbon (IV) oxide is present in soft drinks. State **two** roles of carbon (IV) oxide in soft drinks. (1 mark)
- (ii) Explain the observation made when a bottle containing a soft drink is opened. (2 marks)
- (iii) Carbon (IV) oxide dissolves slightly in water to give an acidic solution. Give the formula of the acid. (1 mark)
- (b) Zinc oxide can be obtained by heating zinc nitrate. A student heated 5.76 g of zinc nitrate.
- (i) Write an equation for the reaction that occurred. (1 mark)
- (ii) Calculate the total volume of gases produced. (Molar gas volume is 24 dm<sup>3</sup>; Zn = 65.4; O = 16.0; N = 14.0). (4 marks)
- (iii) Identify the element that is reduced when zinc nitrate is heated. Give a reason. (2 marks)
- 2 (a) Draw the structure of the following compounds. (2 marks)
- (i) Butanoic acid;
- (ii) Pent-2-ene.
- (b) Explain why propan-1-ol is soluble in water while prop-1-ene is not. (Relative molecular mass of propan-1-ol is 60 while that of prop-1-ene is 42). (2 marks)
- (c) What would be observed if a few drops of acidified potassium manganate (VII) were added to oil obtained from nut seeds? Explain. (2 marks)
- (d) State **one** method that can be used to convert liquid oil from nut seeds into solid. (1 mark)
- (e) Describe how soap is manufactured from liquid oil from nut seeds. (3 marks)
- (f) 0.44 g of an ester **A** reacts with 62.5 cm<sup>3</sup> of 0.08 M potassium hydroxide giving an alcohol **B** and substance **C**. Given that one mole of the ester reacts with one mole of the alkali, calculate the relative molecular mass of the ester. (2 marks)
- 3 (a) Name the method that can be used to obtain pure iron (III) chloride from a mixture of iron (III) chloride and sodium chloride. (1 mark)
- (b) A student was provided with a mixture of sunflower flour, common salt and a red dye. The characteristics of the three substances in the mixture are given in the table below.

Substance	Solubility in water	Solubility in ethanol
Sunflower flour	Insoluble	Insoluble
Common salt	Soluble	Insoluble
Solid red dye	Soluble	Soluble

The student was provided with ethanol and any other materials needed.  
Describe how the student can separate the mixture into its three components.

(3 marks)

- (c) The diagram below shows part of a periodic table. The letters do not represent the actual symbols of elements. Use the diagram to answer the questions that follow.

								Q
R					T			
			N		V		W	
Y							X	

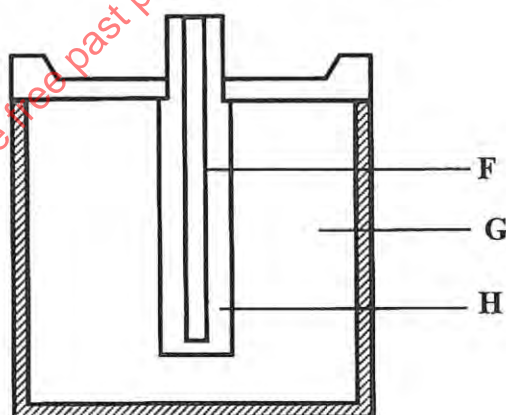
- (i) Explain why the oxidising power of **W** is more than that of **X**. (2 marks)  
 (ii) How do the melting points of **R** and **T** compare? Explain. (2 marks)  
 (iii) Select an element that could be used:  
 (I) in weather balloons; (1 mark)  
 (II) for making a cooking pot. (1 mark)

- (d) (i) Classify the substances water, iodine, diamond and candle wax into elements and compounds. (2 marks)

Elements	Compounds

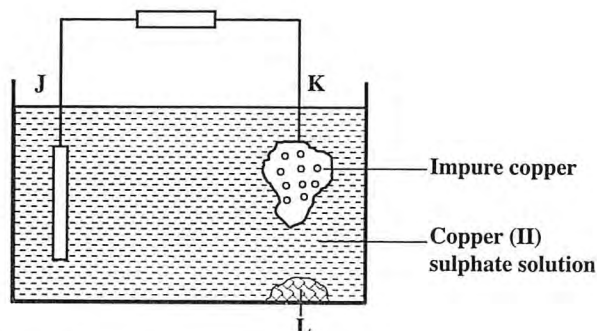
- (ii) Give **one** use of diamond. (1 mark)

- 4 (a) The diagram below represents a dry cell. Use it to answer the questions that follow.



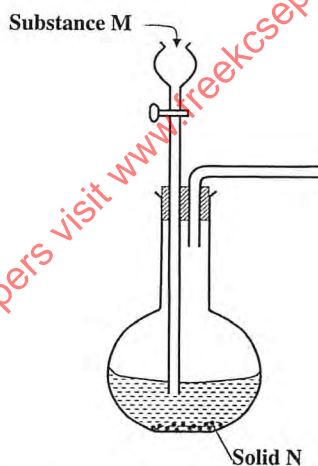
- (i) Which of the letters represent:  
 (I) carbon electrode? (1 mark)  
 (II) the electrolyte? (1 mark)
- (ii) One of the substances used in a dry cell is manganese (IV) oxide. State **two** roles of manganese (IV) oxide in the dry cell. (2 marks)

- (b) Below is a simplified electrolytic cell used for purification of copper. Study it and answer the questions that follow.



- (i) Identify the cathode. (1 mark)
- (ii) Write the equation for the reaction at the anode. (1 mark)
- (iii) What name is given to L? (1 mark)
- (iv) A current of 0.6 A was passed through the electrolyte for 2 hours. Determine the amount of copper deposited.  
(Cu = 63.5; 1 Faraday = 96,500 coulombs). (3 marks)
- (v) State **two** uses of copper metal. (1 mark)

- 5 The set-up below can be used to generate a gas without heating. This occurs when substance M reacts with solid N.



- (a) (i) Complete the table below giving the names of substance M and solid N if the gasses generated are chlorine and sulphur (IV) oxide. (2 marks)

	Chlorine	Sulphur (IV) oxide
Substance M		
Solid N		

- (ii) Complete the diagram above to show how a dry sample of sulphur (IV) oxide can be collected. (3 marks)

- (b) Describe **two** chemical methods that can be used to test the presence of sulphur (IV) oxide. (3 marks)

- (c) Other than the manufacture of sulphuric (VI) acid, state **two** uses of sulphur (IV) oxide. (2 marks)

- 6 (a) Other than concentration, state **two** factors that determine the rate of a reaction.

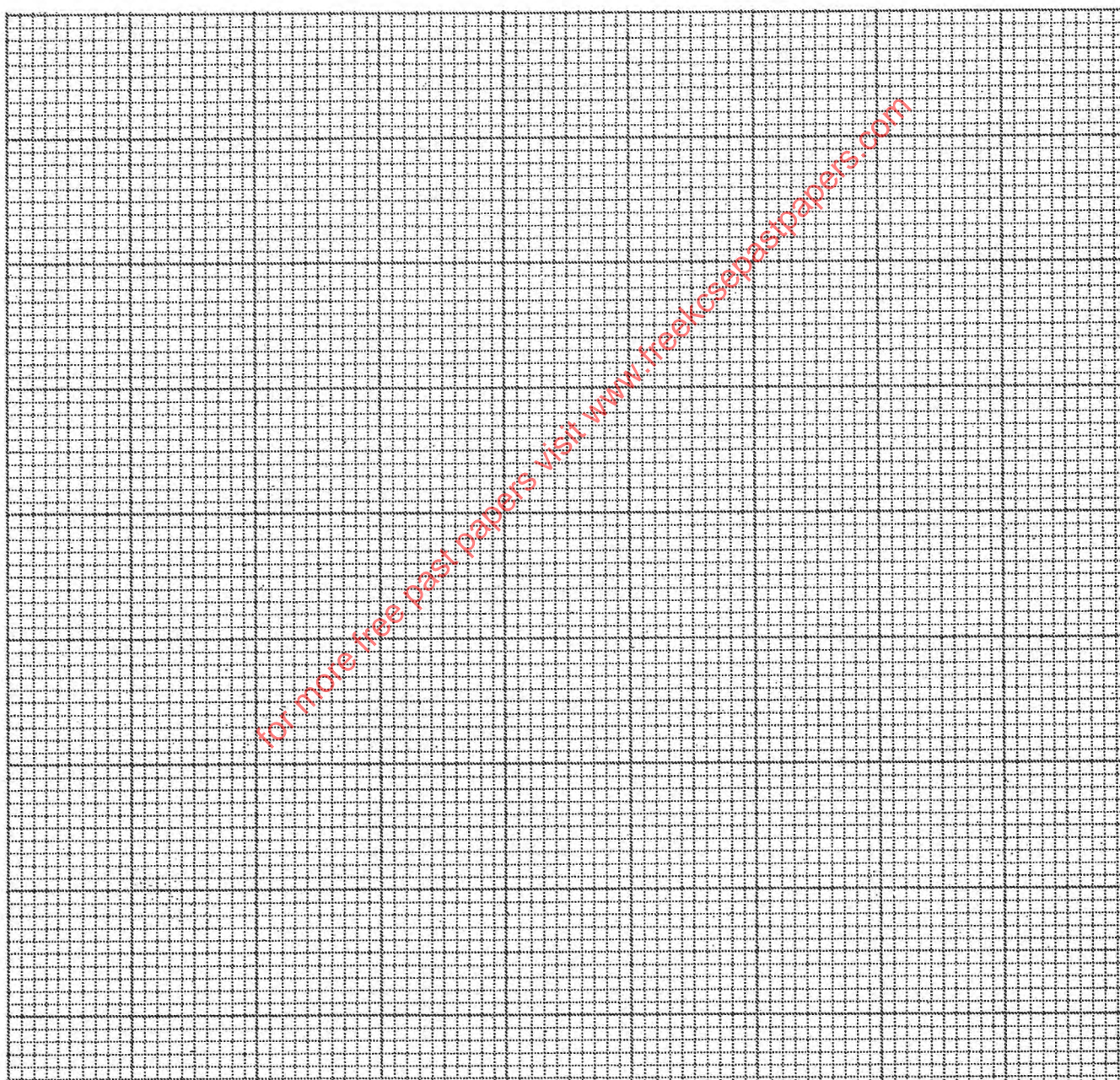
(2 marks)



- (b) In an experiment to determine the rate of reaction, excess lumps of calcium carbonate were added to 2 M hydrochloric acid. The mass of calcium carbonate left was recorded after every 30 seconds. The results are shown in the table below.

Time (seconds)	0	30	60	90	120	150	180	210
Mass of calcium carbonate left (g)	2.00	1.60	1.30	1.00	0.85	0.8	0.8	0.8

- (i) Write the equation for the reaction that took place. (1 mark)
- (ii) On the grid provided, plot a graph of mass of calcium carbonate vertical axis against time. (3 marks)



- (iii) Determine the rate of reaction at the 105<sup>th</sup> second. (3 marks)

- (c) Why does the curve level off after some time? (1 mark)
- (d) On the same grid, sketch a curve for the same reaction using 4 M hydrochloric acid and label the curve R. (2 marks)

- 7 (a) Naturally occurring magnesium consists of three isotopes. 78.6%  $^{24}\text{Mg}$ ; 10%  $^{25}\text{Mg}$  and  $^{26}\text{Mg}$ . Calculate to one decimal place, the relative atomic mass of magnesium. (2 marks)
- (b) When magnesium burns in air, it forms a white solid and a grey-green solid. When a few drops of water are added to the mixture, a gas that turns red litmus paper blue is evolved.

Identify the:

- (i) white solid. (1 mark)
- (ii) gas evolved and state its use.
- (I) Name of gas. (1 mark)
- (II) Use of the gas. (1 mark)
- (c) Two different samples of water (I and II) were tested with soap solution. Sample II was further subjected to two other processes before adding soap. 20 cm<sup>3</sup> of each sample of water was shaken with soap solution in a boiling tube until a permanent lather was obtained. The results are shown in the table below.

Water sample	Volume of soap solution needed (cm <sup>3</sup> )	
	before boiling	after boiling
I	10	5
II	6	6
II after filtering	6	6
II after distilling	2	2

- (i) Identify the water sample that had temporary hardness. Explain your answer. (2 marks)
- (ii) Explain why the results for sample II are different after distilling but remain unchanged after filtering. (2 marks)
- (iii) State **two** disadvantages of using both water samples for domestic purposes. (2 marks)

### 3.7.3 Chemistry Paper 3 (233/3)

1 You are provided with:

- 2.0 g of substance A, labelled solid A.
- Solution B, 0.05 M hydrochloric acid.
- Methyl orange indicator.

You are required to determine the:

- solubility of substance A in water.
- relative formula mass of substance A.

#### PROCEDURE I

- Place 200 cm<sup>3</sup> of tap water in a 250 ml beaker and keep it for use in step (vi).
- Place **all** of substance A in a dry boiling tube.
- Using a burette, measure 10.0 cm<sup>3</sup> of distilled water and add it to the substance A in the boiling tube.
- While stirring the mixture in the boiling tube with a thermometer, warm the mixture using a Bunsen burner, until the temperature rises to 65°C. Stop warming the mixture.
- Allow it to cool while stirring with the thermometer.
- When the temperature drops to 60°C, start the stop watch/clock, place the boiling tube in the beaker with tap water prepared in step (i) above .
- Continue stirring and record the temperature of the mixture after two minutes, then thereafter record the temperature of the mixture after every one minute interval and complete **table 1. Retain the mixture with the thermometer inside for use in procedure II below.**

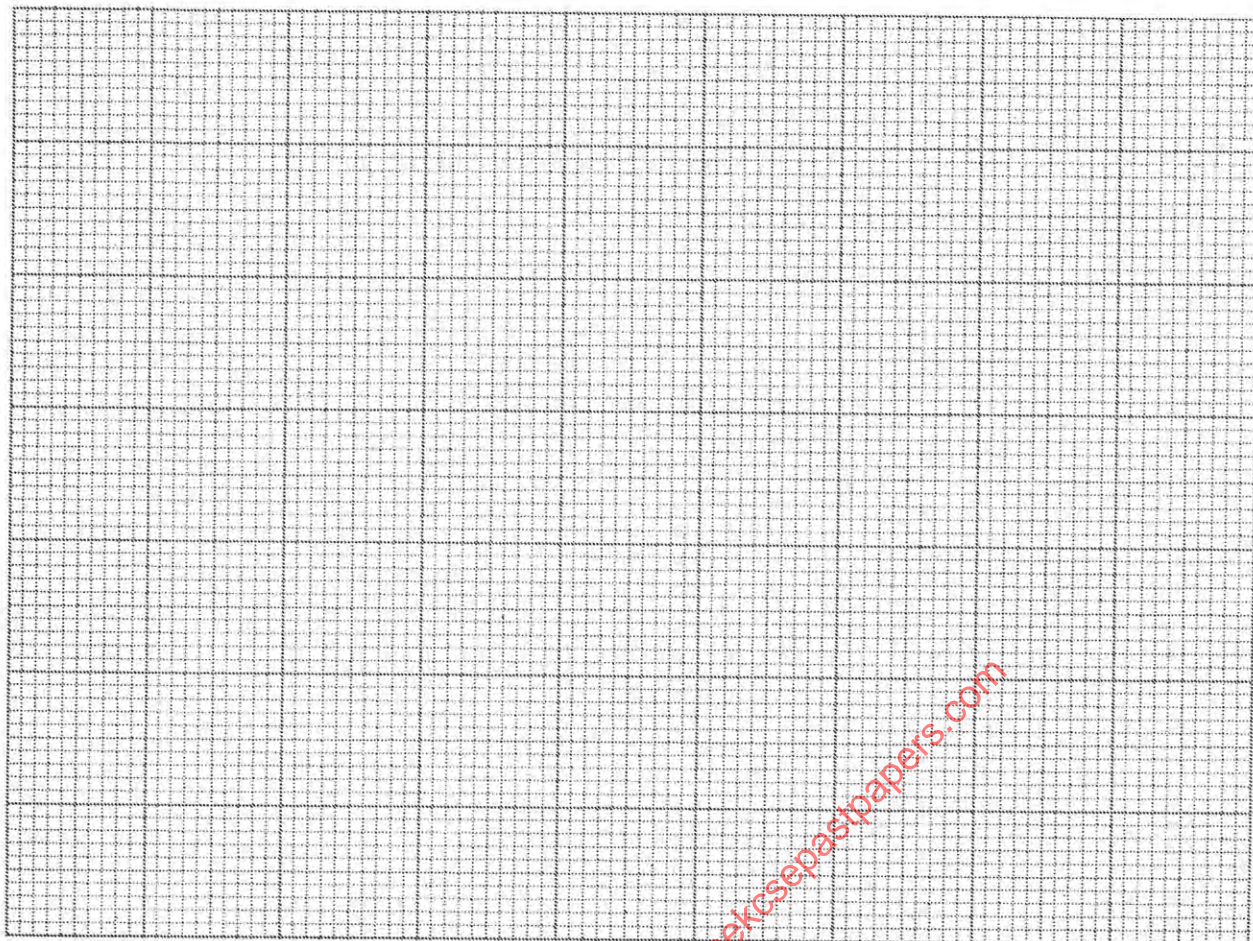
**Table 1**

Time (minutes)	0	2	3	4	5	6	7	8	9	10
Temperature (°C)	60									

(4 marks)

On the grid provided, plot a graph of temperature (vertical -axis) against time.

(3 marks)



- (a) Using the graph, determine the temperature ( $T_s$ ) when 2.0 g of substance **A** dissolves completely in 10.0 cm<sup>3</sup> of distilled water. (1 mark)
- (b) Calculate the solubility of substance **A** in grams per 100 g water at temperature,  $T_s$ . (2 marks)

### PROCEDURE II

Using a funnel, transfer all the mixture obtained from Procedure I into a 250 ml volumetric flask. Rinse the boiling tube and the thermometer with about 20 cm<sup>3</sup> of distilled water and add the rinses into the volumetric flask. Repeat the rinsing two more times. Add about 100 cm<sup>3</sup> of distilled water to the volumetric flask. Shake until all the solid dissolves. Add more distilled water to the mark. Label this as solution **A**. Fill the burette with solution **A**. Using a pipette and **pipette filler**, place 25.0 cm<sup>3</sup> of solution **B**, into a 250 ml conical flask. Add three (3) drops of the indicator provided and titrate using solution **A**. Record your readings in **table 2** below. Repeat the titration two more times and complete the table.

**Table 2**

	I	II	III
Final Burette Reading			
Initial burette Reading			
Volume of solution <b>A</b> (cm <sup>3</sup> ) used.			

(3 marks)

- (a) Calculate the:
- (i) average volume of solution **A** used. (1 mark)
- (ii) number of moles of hydrochloric acid, solution **B** used. (1 mark)
- (b) Given that two moles of acid react with one mole of substance **A**, calculate:
- (i) number of moles substance **A** used. (1 mark)
- (ii) concentration of solution **A** in moles per litre; (1 mark)
- (iii) concentration of solution **A** in g per litre; (1 mark)
- (iv) relative formula mass of substance **A**. (1 mark)

2 You are provided with solid **C**. Carry out the following tests and record your observations and inferences in the spaces provided.  
Place **all** the solid **C** in a boiling tube. Add about 15 cm<sup>3</sup> of distilled water and shake until all the solid dissolves. Use 2 cm<sup>3</sup> portions of the solution in a test-tube, for **each** of the tests in (a), (b), (c), (d), (e) and (f).

- (a) Add aqueous sodium hydroxide dropwise until in excess.

Observations	Inferences
(1 mark)	(1 mark)

- (b) Add aqueous ammonia dropwise until in excess.

Observations	Inferences
(1 mark)	(1 mark)

- (c) Add 2 to 3 drops of solution **D**, aqueous sodium carbonate.  
(Retain the remaining solution **D** for use in question 3)

Observations	Inferences
(1 mark)	(2 marks)

- (d) Add 2 to 3 drops of dilute hydrochloric acid.

Observations	Inferences
(1 mark)	(1 mark)

- (e) Add 2 or 3 drops of aqueous barium chloride.

Observations	Inferences
(1 mark)	(1 mark)

- (f) Add 2 or 3 drops of solution E, aqueous lead (II) nitrate.

Observations	Inferences
(1 mark)	(1 mark)

- 3 You are provided with substance L. Carry out the following tests and record your observations and inferences in the spaces provided. Use about 2 cm<sup>3</sup> portions of substance L in a test-tube for **each** of the tests, (a), (b), (c) and (d).

- (a) Add 2 or 3 drops of bromine water.

Observations	Inferences
(1 mark)	(1 mark)

- (b) Add about 1 cm<sup>3</sup> of acidified potassium dichromate (VI). Warm the mixture.

Observations	Inferences
(1 mark)	(1 mark)

- (c) Add about 1 cm<sup>3</sup> of solution D, aqueous sodium carbonate provided.

Observations	Inferences
(1 mark)	(1 mark)

- (d) Add the piece of magnesium ribbon provided.

Observations	Inferences
(1 mark)	(1 mark)

3.8 GENERAL SCIENCE (237)

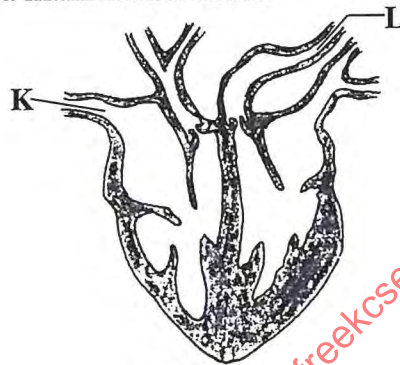
3.8.1 General Science Paper 1 (237/1)

SECTION A: BIOLOGY (34 marks)

Answer ALL the questions in this section in the spaces provided.

- 1 (a) Name **one** example of an organism in the kingdom *monera*. (1 mark)
- (b) State **one** function for each of the following parts of a light microscope:
- (i) coarse adjustment knob; (1 mark)
- (ii) diaphragm. (1 mark)

- 2 (a) **Figure 1** represents a mammalian heart.

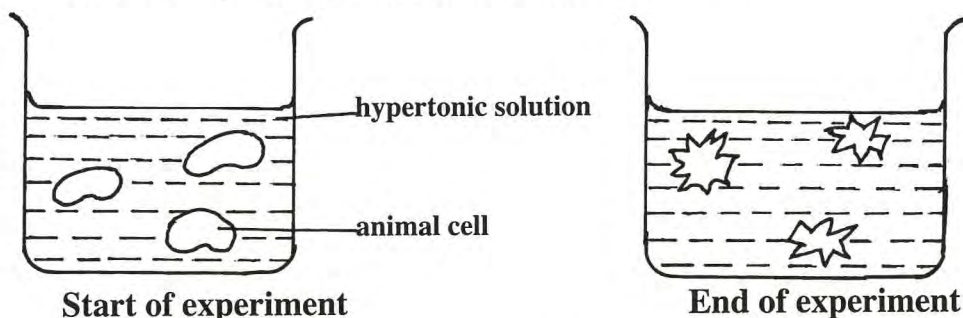


**Figure 1**

On the figure, draw arrows to show the direction of flow of blood in vessels labelled **K** and **L**. (2 marks)

- (b) Students carried out an experiment in which two strips of cobalt chloride paper were clipped one on the upper surface and the other on the lower surface of a leaf of a terrestrial plant. The experimental set-up was left for sometime.
- (i) On which side of the leaf did the cobalt chloride paper change colour faster? (1 mark)
- (ii) Give a reason for your answer in (b) (i) above. (1 mark)

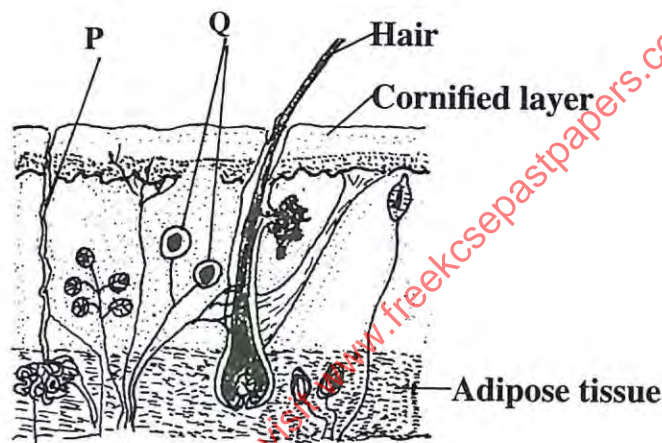
- 3 **Figure 2** illustrates a set-up that was used to demonstrate a process that takes place when animal cells are placed in a hypertonic solution.



**Figure 2**

- (a) Describe the shape of the cells at the end of the experiment. (1 mark)

- (b) Explain the observation made at the end of the experiment. (2 marks)
- 4 (a) State **two** factors that determine energy requirements in human beings. (2 marks)
- (b) Distinguish between autotrophic and heterotrophic nutrition. (2 marks)
- 5 (a) State **two** differences between aerobic and anaerobic respiration. (2 marks)
- (b) Name the branch of biology that deals with the study of relationships between organisms and their environment. (1 mark)
- 6 (a) State **two** features in lungs that make them suitable for gaseous exchange. (2 marks)
- (b) State **one** symptom of asthma. (1 mark)
- 7 (a) **Figure 3** represents a transverse section of a mammalian skin.



**Figure 3**

Name the structures labelled **P** and **Q**.

- (i) **P** ..... (1 mark)
- (ii) **Q** ..... (1 mark)

- (b) Explain how the kidney regulates the amount of water in the body. (2 marks)
- 8 (a) State **two** ways of controlling liver cirrhosis. (2 marks)
- (b) What is excretion? (1 mark)
- 9 (a) State the meaning of the following terms:
- (i) tissue; (1 mark)
- (ii) cell. (1 mark)
- (b) State **one** importance of scientific naming of organisms. (1 mark)



- 10 (a) State ways by which mineral salts and water are absorbed into the root hairs of plants.
- (i) Mineral salts; (1 mark)
- (ii) Water. (1 mark)
- (b) Explain how one can determine if a food substance contains proteins. (2 marks)

**SECTION B: CHEMISTRY (33 marks)**

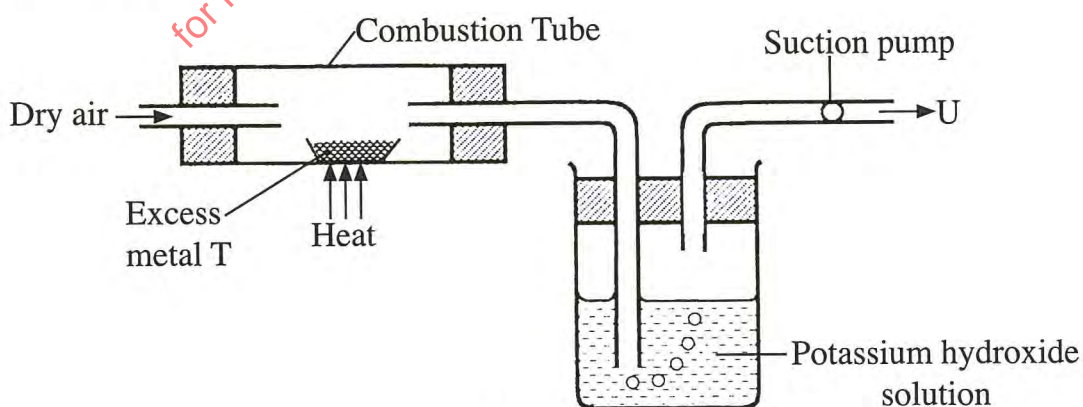
Answer *ALL* the questions in this section in the spaces provided.

- 11 **Table 1** shows the pH values of solutions P, Q, R and T.

**Table 1**

Solution	P	Q	R	T
pH	9	6	11	2

- (a) State the observations made when both blue and red litmus papers are dipped into solution P. (1 mark)
- (b) Name the type of reaction that occurs when solution R reacts with solution T. (1 mark)
- 12 (a) Given the following reagents; lead (II) oxide, dilute nitric (V) acid and sodium sulphate solution, describe how a student can prepare a sample of lead (II) sulphate. (3 marks)
- (b) State **one** use of calcium sulphate salt. (1 mark)
- 13 **Figure 4** shows a set-up that was used to investigate the properties of some of the components of air.



**Figure 4**

- (a) Metal T is in group two of the periodic table. Write the formula of the product formed in the combustion tube. (1 mark)

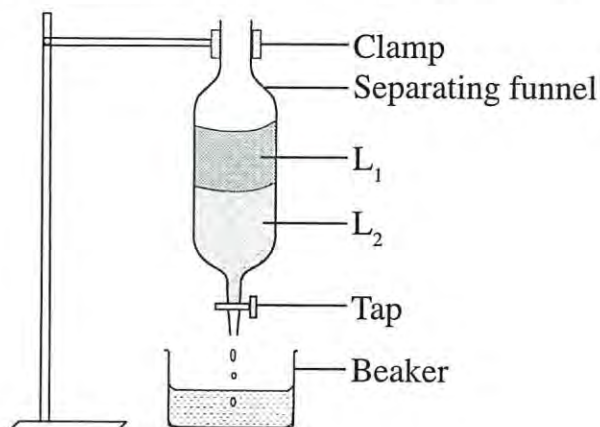
- (b) State the role of potassium hydroxide solution. (1 mark)
- (c) Identify the main gas in U. (1 mark)
- 14 (a) An atom of element D has a mass number of 19 and 10 neutrons.
- (i) Write the electron arrangement of the atom. (1 mark)
- (ii) In which period does element D belong? (1 mark)
- (b) A compound has a formula  $X_2Y_3$ . In which group of the periodic table does X belong? (1 mark)

- 15 The elements L, M and N are in the same group. Study **Table 2** and answer the questions that follow. The letters are not the actual symbols of the elements.

**Table 2**

Element	Atomic number	Atomic radius (nm)	First ionization energy in $\text{kJmol}^{-1}$
L	4	0.089	900
M	12	0.136	736
N	20	0.174	590

- (a) (i) Explain why the atomic radius of N is larger than that of L. (1 mark)
- (ii) Arrange the elements in order of reactivity starting with the **least** reactive. (1 mark)
- (b) Why does the 1<sup>st</sup> ionisation energy of the elements decrease down the group? (2 marks)
- 16 (a) A student used the apparatus in **Figure 5** to separate liquids  $L_1$  and  $L_2$ .



**Figure 5**

State **two** physical properties that enabled liquids  $L_1$  and  $L_2$  to be separated.

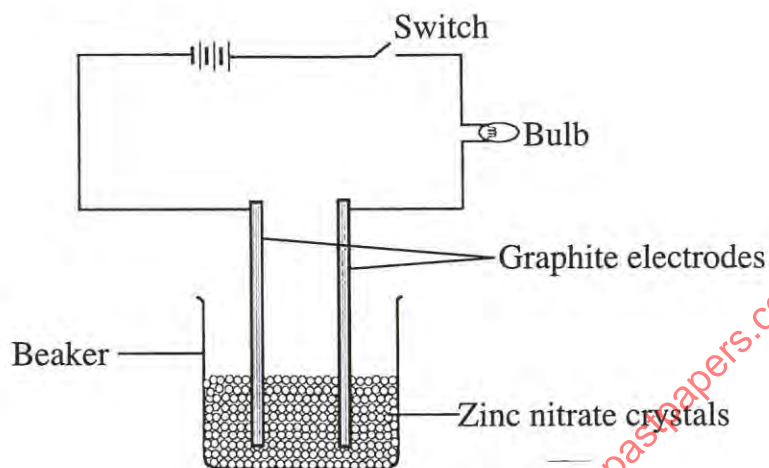
(2 marks)

(b) What precaution should be taken to ensure complete separation of the two liquids? (1 mark)

17 (a) Explain why diamond is the hardest substance. (2 marks)

(b) State **one** use of diamond. (1 mark)

18 The set-up shown in **Figure 6** was used by a student to investigate the effect of electric current on zinc nitrate crystals.



**Figure 6**

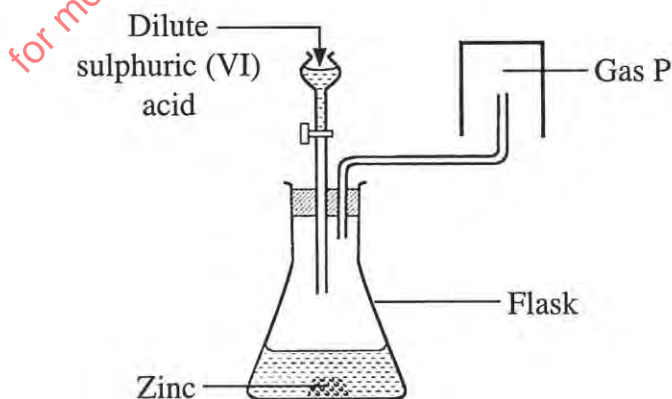
(a) When the switch was put on, the bulb did not light. When water was added into the beaker, the bulb lit. Explain. (2 marks)

(b) Identify the ions that were attracted to the cathode. (1 mark)

19 (a) Describe how temporary hard water is formed. (2 marks)

(b) State **one** advantage of drinking hard water. (1 mark)

20 Study the set-up shown in **Figure 7** and answer the questions that follow.



**Figure 7**

(a) Write an equation for the reaction that occurs in the flask. (1 mark)

(b) Explain why the gas is collected as shown in the set-up. (1 mark)

(c) State **one** commercial use of gas P. (1 mark)

21 State **two** physical properties that are used to determine purity of a substance. (2 marks)

**SECTION C: PHYSICS (33 marks)**

*Answer ALL the questions in this section in the spaces provided.*

22 A stopwatch used to time a falling object started 0.20 s after the start button was pressed. The time recorded was 3.22 s, determine the time of the fall. (2 marks)

23 Describe adhesive forces. (2 marks)

24 It was observed that a partially inflated balloon becomes fully inflated as it rises. Explain this observation. (2 marks)

25 Fine chalk dust particles are suspended in water then observed through a microscope. The particles are observed to move in a random manner. Explain this observation. (2 marks)

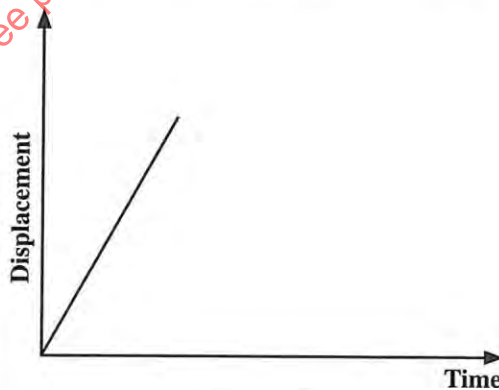
26 Name **two** types of thermometers. (2 marks)

27 Explain why a metallic seat inside a room feels cooler than a wooden seat in the same room. (2 marks)

28 Ventilation holes in a room are placed at a higher level than the doors and windows. Explain how they work to keep the room ventilated. (2 marks)

29 (a) Define the term displacement as used in linear motion. (1 mark)

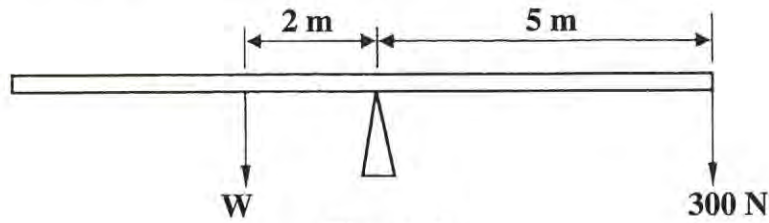
(b) **Figure 8** represents a displacement-time graph of a body in motion.



**Figure 8**

Describe the motion of the body. (2 marks)

- 30 **Figure 9** shows a set-up that was used to determine the weight ( $w$ ) of a wooden plank.



**Figure 9**

- Calculate the value of  $w$ . (3 marks)
- 31 A cork with a narrow tube through it is used to seal a conical flask full of water at  $0^{\circ}\text{C}$ . The water level in the tube is above the cork. The flask is held vertically and lowered into hot water. Explain what is observed. (2 marks)
- 32 State the energy changes that take place when a stone is thrown vertically upwards, reaches the highest point then starts falling. (2 marks)
- 33 A student observed that a string extended by 3 cm when supporting a load of 4.5 N. Determine its spring constant. (3 marks)
- 34 Define the term **centre of gravity**. (1 mark)
- 35 A bag of maize at the back of an open pick-up slides backward when the pick-up suddenly starts moving forward. Explain the reason why this happens. (2 marks)
- 36 A piece of steel sinks in water. Explain how it can be made to float. (3 marks)

3.8.2 General Science Paper 2 (237/2)

SECTION A: BIOLOGY (34 marks)

Answer *all* the questions in this section in the spaces provided.

- 1 (a) What is meant by the following terms:
- (i) habitat; (1 mark)
  - (ii) population? (1 mark)
- (b) Explain **one** effect for each of the following air pollutants to the environment:
- (i) sulphur (IV) oxide; (2 marks)
  - (ii) smoke. (2 marks)
- 2 (a) Explain the significance of the position of testis in humans. (2 marks)
- (b) State **two** reasons why reproduction is important. (2 marks)
- 3 (a) **Figure 1** illustrates a longitudinal section of a bean seed.



Figure 1

Name the parts labelled **A** and **B**.

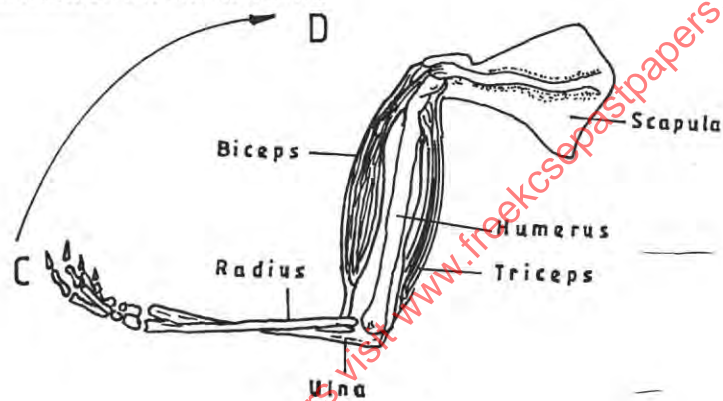
**A** ..... (1 mark)

**B** ..... (1 mark)

- (b) (i) Distinguish between the terms epicotyl and hypocotyl. (1 mark)
- (ii) Name a plant hormone that promotes apical dominance. (1 mark)
- 4 (a) State the meaning of the following terms:
- (i) genetics; (1 mark)
  - (ii) genes. (1 mark)

- (b) What is meant by:
- (i) complete dominance; (1 mark)
- (ii) phenotype? (1 mark)
- 5 (a) Explain why Lamarck's evolution theory was discredited. (2 marks)
- (b) What is meant by complete metamorphosis in insects? (1 mark)
- 6 State **two** similarities between the endocrine and the nervous system. (2 marks)
- 7 (a) How are the vascular bundles arranged in young:
- (i) monocotyledonous stem; (1 mark)
- (ii) dicotyledonous stem? (1 mark)

(b) **Figure 2** illustrates the human arm.



**Figure 2**

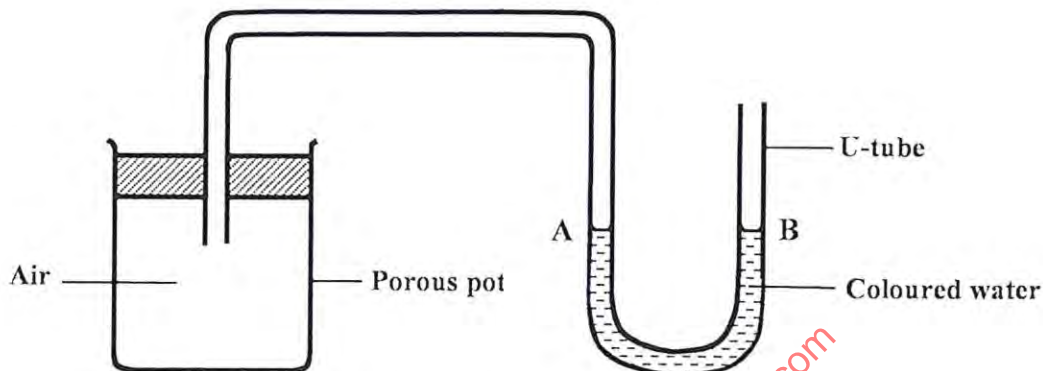
Describe how the muscles work to move the forearm from point C to D. (1 mark)

- 8 (a) Name the causative agent of syphilis. (1 mark)
- (b) Which hormone brings about ovulation in humans? (1 mark)
- 9 (a) State **two** ways in which genetic counselling is used in the community. (2 marks)
- (b) State how the following eye defects can be corrected:
- (i) short sightedness; (1 mark)
- (ii) astigmatism. (1 mark)
- 10 State **two** differences between simple reflex action and conditioned reflex action. (2 marks)

**SECTION B: CHEMISTRY (33 marks)**

Answer *all* the questions in this section in the spaces provided.

- 11 (a) State the **two** conditions under which Graham's Law of diffusion operates. (1 mark)
- (b) **Figure 3** shows a set-up in which the porous pot contained air.



**Figure 3**

- (i) State the observation made in the U-tube if air was replaced with carbon (IV) oxide. (1 mark)
- (ii) Explain the observation made in (b) (i) above. (1 mark)
- 12 (a) What is meant by the term **molarity** of a solution? (1 mark)
- (b) 100 cm<sup>3</sup> of 0.1 M sodium hydroxide solution was mixed with 100 cm<sup>3</sup> of 1 M sodium hydroxide solution.
- (i) calculate the number of moles contained in the mixture; (2 marks)
- (ii) Determine the molarity of the mixture. (2 marks)
- 13 (a) Complete the following table:

Polymer	Use
Cellulose	.....
.....	Plastic water pipes

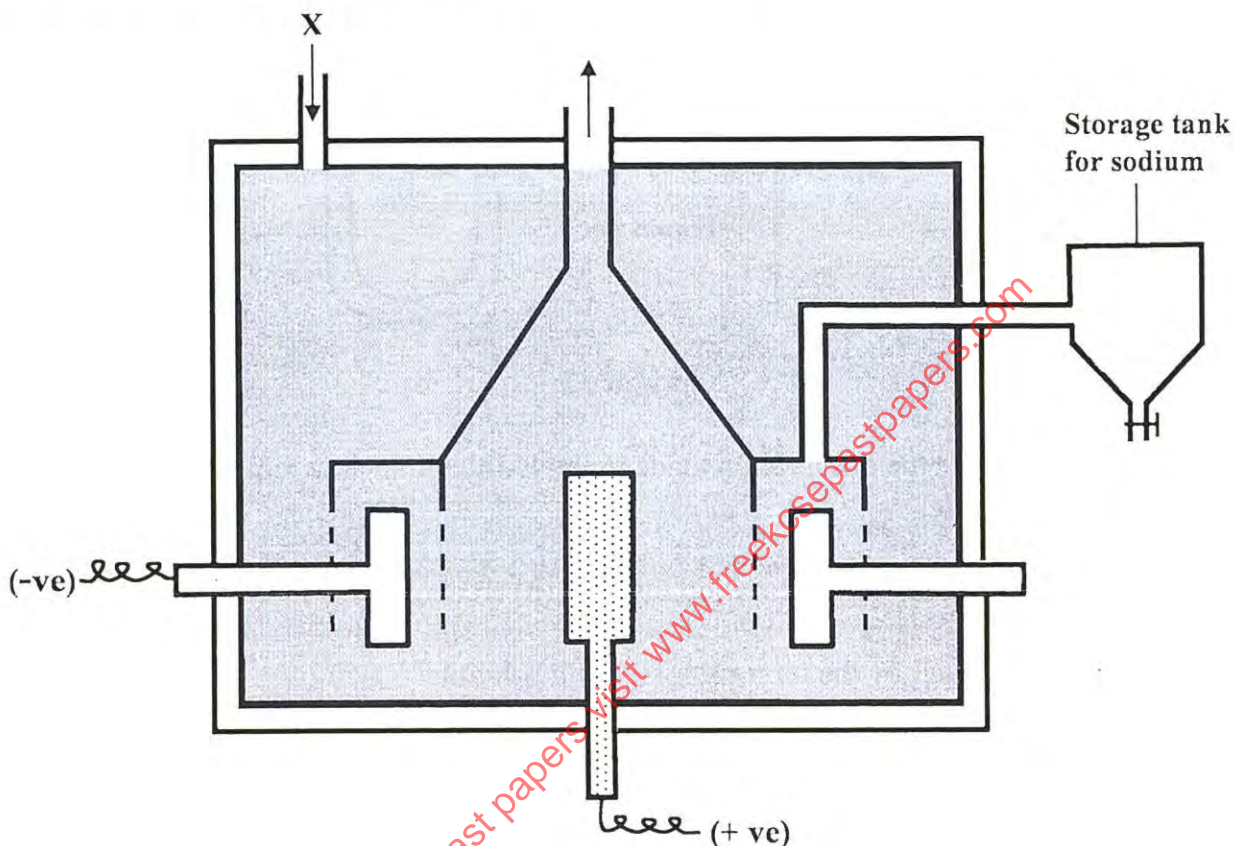
- (b) State **two** pollution effects of detergents to the environment. (2 marks)



14 Explain the following statements:

- (a) sulphur (IV) oxide is a bleaching agent in wet conditions; (2 marks)
- (b) newspapers turn yellow-brown after exposure to sunlight over a period of time. (1 mark)

15 **Figure 4** is a representation of Down's cell used in the extraction of sodium metal. Study it and answer the questions that follow.



**Figure 4**

- (a) Name the materials that are introduced at X. (1 mark)
- (b) Write an equation for the reaction that occurs at the anode. (1 mark)
- (c) What material is the cathode made of? (1 mark)
- (d) Give **two** industrial uses of sodium metal. (1 mark)
- 16 (a) What is meant by “enthalpy of combustion”? (1 mark)

- (b) The table below shows heating values of some fuels. Use it to answer the questions that follow.

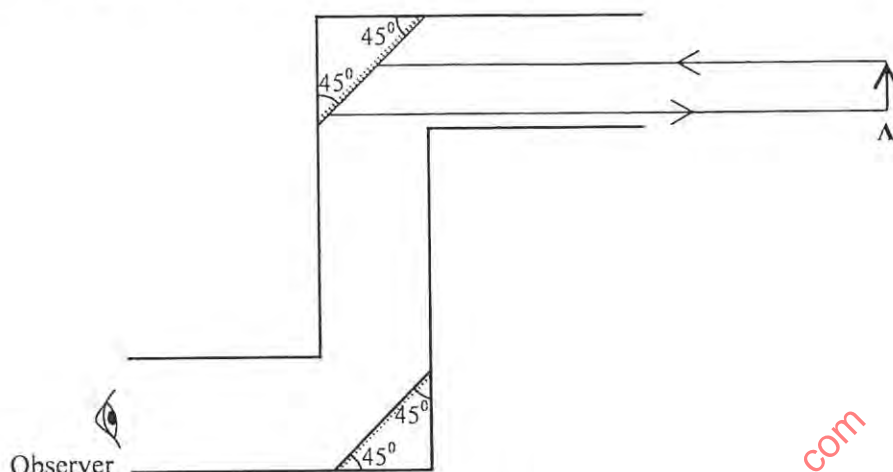
Fuel	State at room temperature	Heating value in $\text{kJg}^{-1}$
Ethanol	Liquid	30
Kerosene	Liquid	48
Charcoal	Solid	33
Propane	Gas	50

- (i) Identify the best fuel for use in jet engines. (1 mark)
- (ii) Give **two** reasons for the answer in b(i) above. (1 mark)
- (iii) Which fuel has the greatest pollution effect? Explain. (2 marks)
- 17** Explain how each of the following affects rate of chemical reaction.
- (a) Increase in surface area; (2 marks)
- (b) Decrease in concentration. (2 marks)
- 18** (a) When chlorine gas is passed through a solution of potassium iodide, the following reaction takes place.
- $$\text{Cl}_{2(g)} + 2\text{KI}_{(aq)} \longrightarrow 2\text{KCl}_{(aq)} + \text{I}_{2(s)}$$
- Identify the oxidising agent in the reaction. (1 mark)
- (b) Explain the pollution effects of chlorofluorocarbons (CFCs) to the environment. (2 marks)
- 19** When a green solid is heated, it forms a black residue and produces a colourless gas which forms a white precipitate with a solution of calcium hydroxide.
- (a) Identify the green solid. (1 mark)
- (b) Write an equation for the reaction that produces the white precipitate. (1 mark)

**SECTION C: PHYSICS** (33 marks)

Answer **all** the questions in this section in the spaces provided.

**20** Figure 5 is a diagram of a periscope.



**Figure 5**

Complete the ray diagram to show the image of object A as seen by the observer. (3 marks)

**21** An ebonite rod is charged by rubbing with fur. The rod becomes negatively charged while the fur becomes positively charged. Explain how this happens. (2 marks)

**22** Draw and label a simple electric circuit diagram having a cell, a bulb, a switch and an ammeter. (Use circuit symbols) (2 marks)

**23** State **two** factors that affect the speed of sound in air. (2 marks)

**24** Describe a:

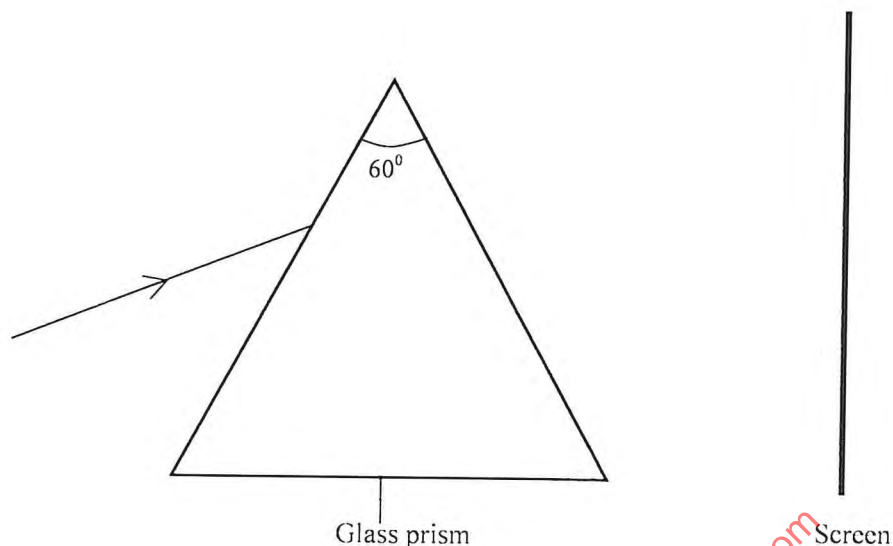
(a) transverse wave; (1 mark)

(b) longitudinal wave. (1 mark)

**25** A student placed two iron nails in contact with one end of a bar magnet. The student observed that the free ends of nails moved apart from each other. Explain this observation. (3 marks)

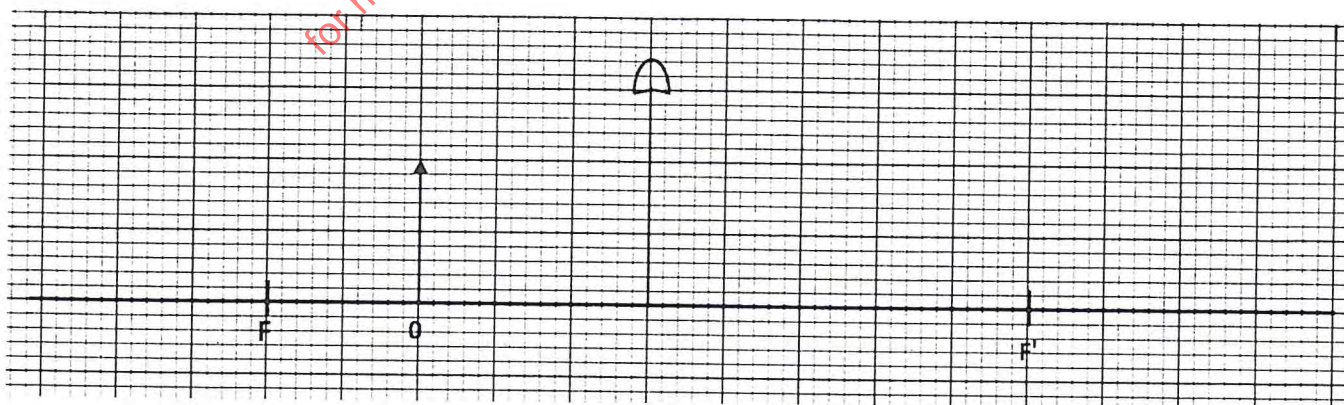
**26** Define electrical resistance and state its SI unit. (2 marks)

- 27 **Figure 6** shows a set-up used to study the effect of placing a triangular glass prism in the path of white light.



**Figure 6**

- (a) State what will be observed on the screen. (1 mark)
- (b) Name the phenomenon being studied. (1 mark)
- 28 A student made two heating coils using two different wires and used the coils to heat equal amounts of water in identical containers for the same length of time. At the end of heating, water in one of the containers was at a higher temperature than the other. State **two** factors that would have led to the difference in temperatures. (2 marks)
- 29 **Figure 7** shows an object **O** placed in front of a converging lens which has the principle focus at **F**. (3 marks)



On the figure, construct a ray diagram to locate the image formed.

- 30 A shopkeeper pays an electricity bill of ksh. 180.90 for using four identical bulbs for 3 hours per day for 30 days. If the cost of electricity is ksh. 6.70 per kilowatt hour, determine the power of each bulb. (3 marks)
- 31 State the role of the control grid in a cathode ray oscilloscope (CRO). (1 mark)
- 32 State any **two** dangers of exposure to X-rays. (2 marks)
- 33 Explain how a photographic film is used to detect radiations. (2 marks)
- 34 Explain how a P-N junction diode can be forward biased. (2 marks)

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### 3.9 HISTORY & GOVERNMENT (311)

#### 3.9.1 History & Government Paper 1 (311/1)

##### SECTION A (25 marks)

Answer **all** the questions in this section in the answer booklet provided.

- 1 Define the term 'pre-history'. (1 mark)
- 2 Identify **two** sub-groups of the Kalenjin speakers. (2 marks)
- 3 State **two** functions of the council of elders among the Somali. (2 marks)
- 4 State **two** economic activities of the Akamba during the pre-colonial period. (2 marks)
- 5 Name the winds that aided the early visitors to come to the Kenyan coast up to 1500 AD. (1 mark)
- 6 Give **two** reasons why Seyyid Said moved his capital from Muscat to Zanzibar. (2 marks)
- 7 Give **two** peaceful methods of resolving conflicts in Kenya. (2 marks)
- 8 State **two** ways in which direct democracy is exercised in Kenya. (2 marks)
- 9 Give **one** reason why the British used indirect rule in some parts of Kenya. (1 mark)
- 10 Identify **two** education commissions established in Kenya before independence. (2 marks)
- 11 Name the body that made laws in Kenya during the colonial period. (1 mark)
- 12 Outline **two** problems experienced by political associations in Kenya up to 1939. (2 marks)
- 13 Who formed the Kenya Peoples' Union in 1966? (1 mark)
- 14 Give **one** type of parliamentary election held in Kenya. (1 mark)
- 15 Name **one** ex-officio member of the Senate in Kenya. (1 mark)
- 16 State **one** feature of African socialism in Kenya. (1 mark)
- 17 Identify **one** type of public revenue expenditure by the National Government of Kenya. (1 mark)

## SECTION B (45 marks)

Answer any **three** questions from this section in the answer booklet provided.

- 18 (a) Give **five** reasons which influenced the migration of the Abagusii into Kenya during the pre-colonial period. (5 marks)
- (b) Discuss **five** effects of migration and settlement of the Plain Nilotes during the pre-colonial period. (10 marks)
- 19 (a) State **five** reasons for the Portuguese success in the conquest of the Kenyan coast. (5 marks)
- (b) Explain **five** social effects of the Indian Ocean Trade on the people of the Kenyan coast up to 1500 AD. (10 marks)
- 20 (a) Give **five** reasons for the construction of the Uganda railway. (5 marks)
- (b) Explain **five** problems encountered during the construction of the Uganda railway. (10 marks)
- 21 (a) State **five** factors that facilitated the Mau Mau movement. (5 marks)
- (b) Explain **five** roles played by the trade union movement in the struggle for independence in Kenya. (10 marks)

## SECTION C (30 marks)

Answer any **two** questions from this section in the answer booklet provided.

- 22 (a) Give **three** factors that led to the introduction of multi-party democracy in Kenya in the early 1990s. (3 marks)
- (b) Describe **six** achievements of multi-party democracy in Kenya. (12 marks)
- 23 (a) State **three** functions of the Chief Justice in Kenya. (3 marks)
- (b) Explain **six** problems facing Judiciary in Kenya. (12 marks)
- 24 (a) State **three** ways in which the National Government relates with the County Governments. (3 marks)
- (b) Explain **six** challenges faced by the County Governments in Kenya. (12 marks)

### 3.9.2 History & Government Paper 2 (311/2)

#### SECTION A (25 marks)

Answer *all* the question in this section.

- 1 Identify **two** branches of history. (2 marks)
- 2 State **one** theory that explains how early agriculture developed. (1 mark)
- 3 Identify **two** methods of irrigation used in ancient Egypt. (2 marks)
- 4 Give **two** features of the Roman roads by 300 AD. (2 marks)
- 5 State **one** advantage of horn blowing as a means of communication during the pre-colonial period. (1 mark)
- 6 Identify the **main** source of energy used in the early stages of Industrial Revolution in Europe. (1 mark)
- 7 State **one** advantage of using steel over iron during the Industrial Revolution in Europe. (1 mark)
- 8 Give the **main** factor that contributed to the emergence of Johannesburg as a modern urban centre. (1 mark)
- 9 Identify **two** methods used by the European powers to acquire colonies in Africa. (2 marks)
- 10 Name the European power that colonized Zimbabwe. (1 mark)
- 11 Identify **two** types of weapons used during the cold war. (2 marks)
- 12 State **one** way in which members of Non-Aligned Movement maintain neutrality in world affairs. (1 mark)
- 13 Give **two** functions of the East African Legislative Assembly of the East African Community, 2001. (2 marks)
- 14 State **one** function of the Court of Justice of the Common Market for Eastern and Southern Africa (COMESA). (1 mark)
- 15 Identify **two** principles of the Arusha Declaration of 1967. (2 marks)
- 16 Give **two** categories of persons who are disqualified from contesting for a constituency seat in Britain. (2 marks)
- 17 Name **one** house of parliament in India. (1 mark)



**SECTION B** (45 marks)

*Answer three questions from this section.*

- 18** (a) State **five** stages of evolution of man. (5 marks)
- (b) Describe the way of life of human being during the Late Stone Age period. (10 marks)
- 19** (a) State **five** disadvantages of using barter trade during the Trans-Saharan trade. (5 marks)
- (b) Describe the organization of the Trans-Saharan Trade. (10 marks)
- 20** (a) Identify **five** forms of print media used in communication. (5 marks)
- (b) Explain **five** positive effects of telecommunication in society. (10 marks)
- 21** (a) State **five** factors that promoted nationalism in Ghana. (5 marks)
- (b) Explain **five** factors that contributed to the success of the Front for the Liberation of the Mozambique (FRELIMO) in the struggle for independence in Mozambique. (10 marks)

**SECTION C** (30 marks)

*Answer two questions from this section.*

- 22** (a) Give **three** functions of the Lukiiko in the kingdom of Buganda during the pre-colonial period. (3 marks)
- (b) Discuss **six** factors that led to the growth of the Asante empire by the 19th century. (12 marks)
- 23** (a) Give **three** reasons why the United States of America did not join the First World War until 1917. (3 marks)
- (b) Explain **six** effects of the First World War. (12 marks)
- 24** (a) State **three** common characteristics of the Commonwealth member states. (3 marks)
- (b) Describe **six** achievements of the Commonwealth since its formation. (12 marks)

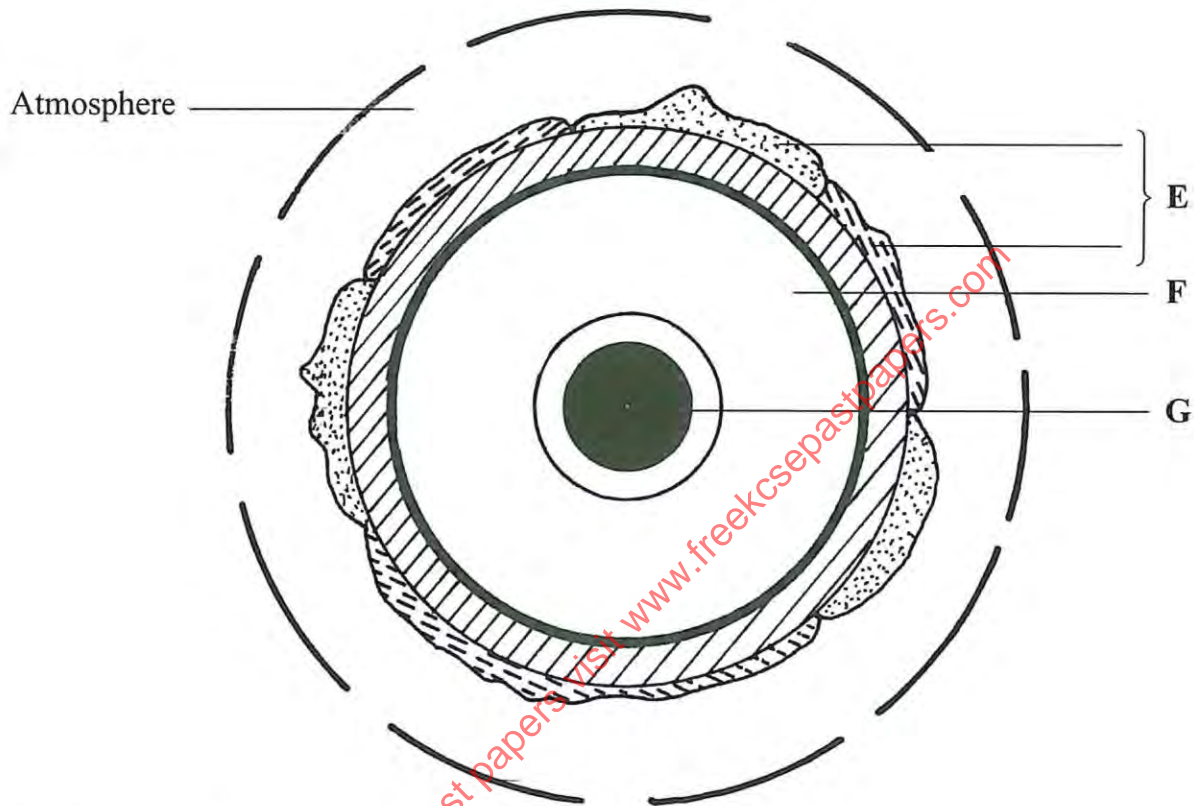
3.10 GEOGRAPHY (312)

3.10.1 Geography Paper 1 (312/1)

SECTION A

Answer *all* the questions in this section.

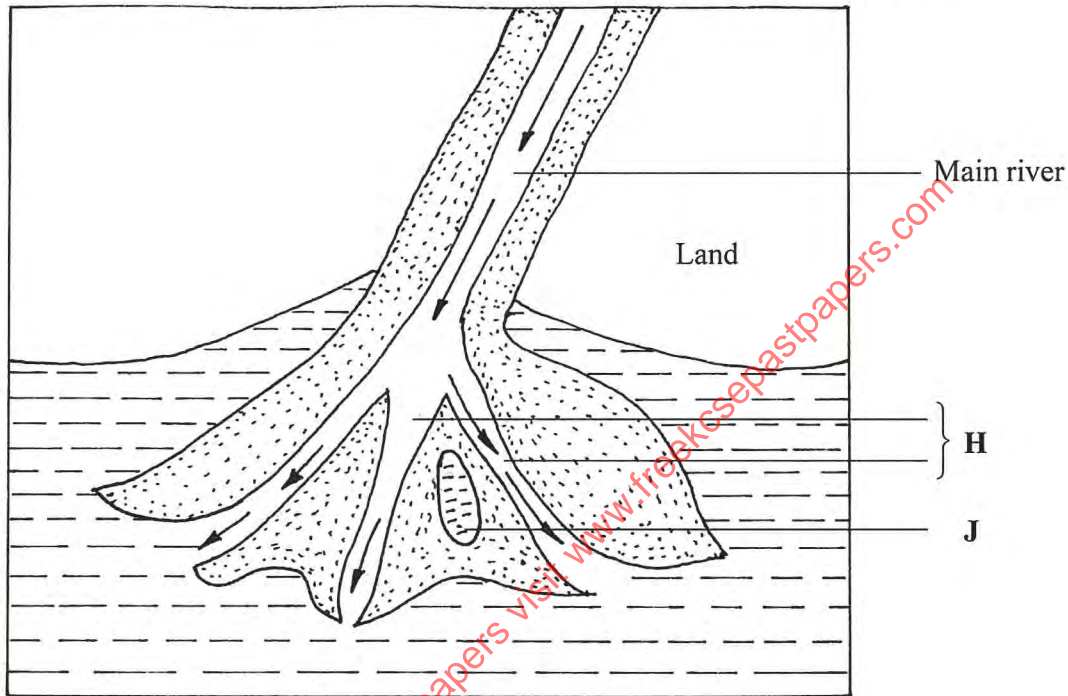
- 1 The diagram below represents the structure of the earth. Use it to answer question (a).



- (a) Name:
- (i) the layers marked E and F. (2 marks)
  - (ii) the minerals that make up the layer marked G. (2 marks)
- (b) Give **two** effects of the rotation of the earth on its axis. (2 marks)
- 2 (a) What is a metamorphic rock? (2 marks)
- (b) Give **three** examples of metamorphic rocks. (3 marks)
- 3 (a) Name **two** types of boundaries according to the plate tectonic theory. (2 marks)
- (b) Give **three** effects of the movement of tectonic plates. (3 marks)

- 4 (a) What is an earthquake? (2 marks)
- (b) Identify the scale used to measure:
- (i) the intensity of earthquakes; (1 mark)
- (ii) the magnitude of earthquakes. (1 mark)
- 5 (a) Give **three** characteristics of a river in its middle stage. (3 marks)

The diagram below shows a Bird's foot delta. Use it to answer question (b).



- (b) Identify the features marked **H** and **J**. (2 marks)

### SECTION B

Answer **question 6** and any other **two** questions from this section.

- 6 Study the map of Busia 1:50,000 (sheet 101/1) provided and answer the following questions.
- (a) (i) Convert the ratio scale of the map extract into a statement scale. (2 marks)
- (ii) What is the general direction of flow of river Sio? (1 mark)
- (iii) Identify the **two** dominant types of natural vegetation shown in the area covered by the map. (2 marks)
- (b) Draw a square 10 cm by 10 cm to represent the area to the west of Easting 30 and north of Northing 40. On the square, mark and label:
- (i) an international boundary;
- (ii) an air photo principal point;

- (iii) river Sio;  
(iv) the area above 1200 metres above sea level. (5 marks)

(c) Describe the relief of the area covered by the map. (5 marks)

(d) (i) Explain how the following factors have influenced the distribution of settlements in the area covered by the map:

• drainage; (2 marks)

• transport. (2 marks)

(ii) Citing evidence from the map, state **three** functions of Funyula town. (6 marks)

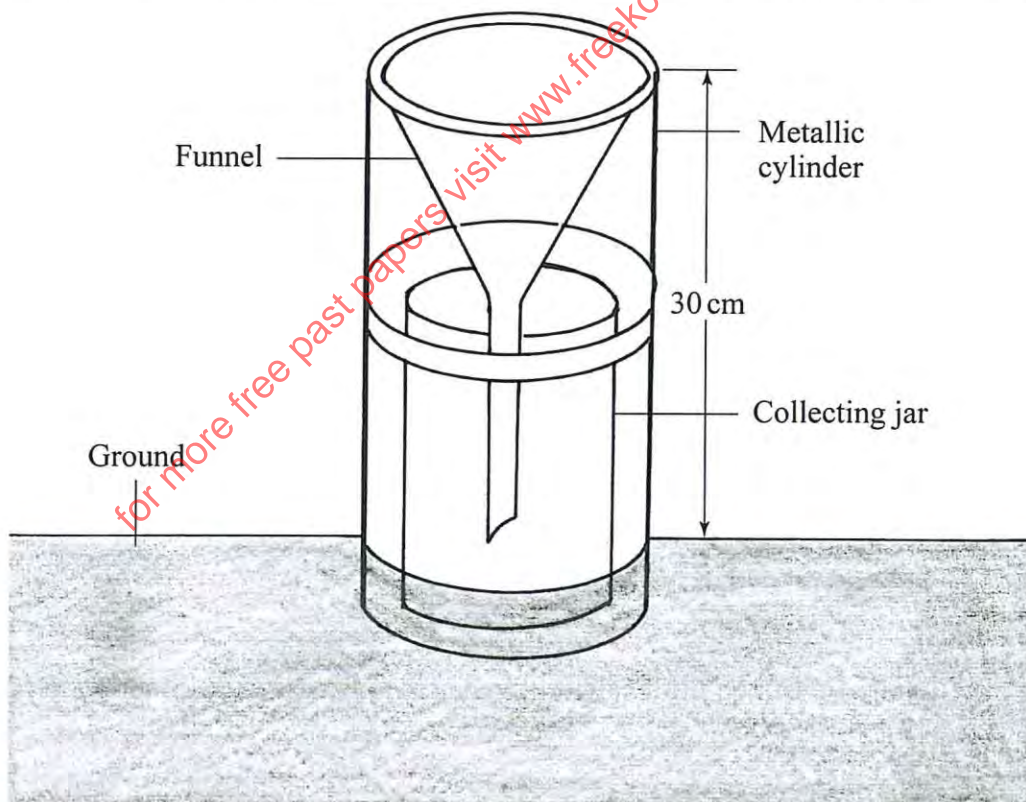
7 (a) (i) Define the term weather. (2 marks)

(ii) Explain how the following factors influence weather:

• cloud cover; (4 marks)

• local winds. (4 marks)

The diagram below represents a weather measuring instrument. Use it to answer question (b).



(b) (i) Which element of weather is measured using the instrument shown above? (1 mark)

(ii) Describe how the above instrument is used. (3 marks)

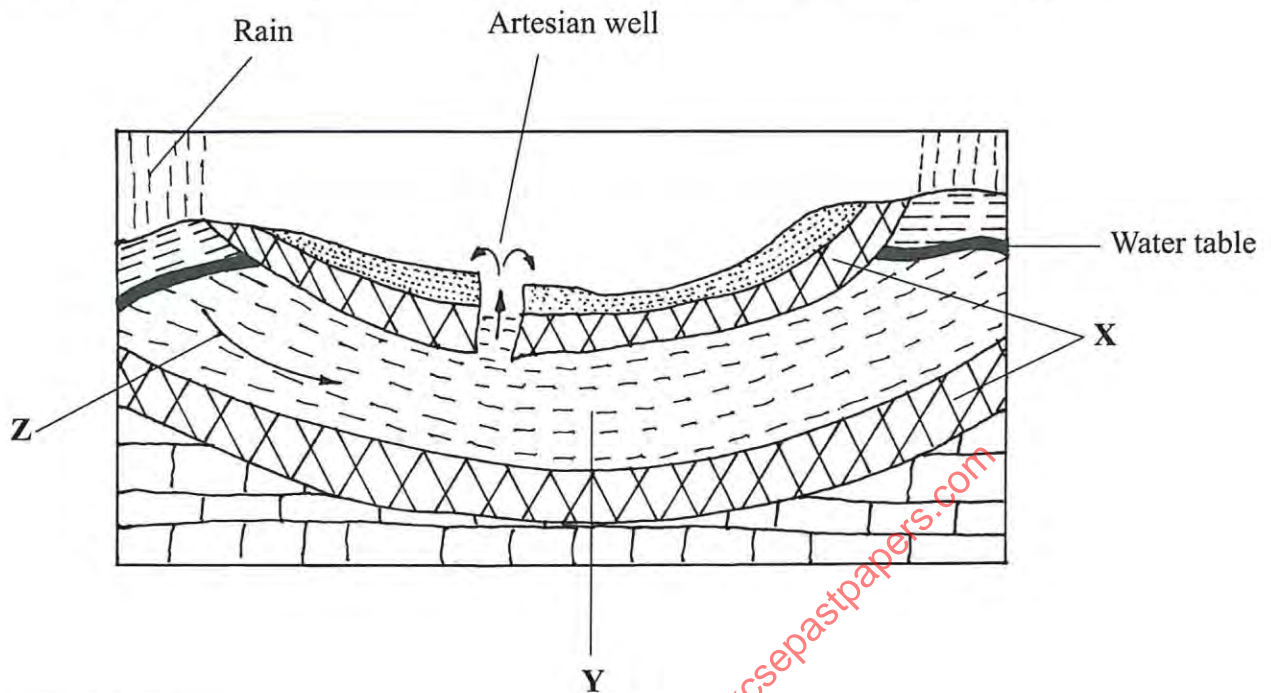
The table below shows the temperature and rainfall readings for station **T** in one week. Use it to answer question (c).

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Temperature °C	23	23	24	21	25	25	23
Rainfall in mm	50	49	55	45	60	60	49

- (c) (i) Calculate:
- the range of temperature for the week. (1 mark)
  - the mean weekly rainfall. (2 marks)
- (ii) State **four** characteristics of the weather in station **T**. (4 marks)
- (d) Give **four** characteristics of the stratosphere. (4 marks)
- 8** (a) (i) Apart from the Rift Valley, name **three** other relief features formed as a result of faulting. (3 marks)
- (ii) With the aid of diagrams, describe how the Great Rift Valley may have been formed by tensional forces. (8 marks)
- (b) Explain **three** ways in which faulting may influence drainage systems. (6 marks)
- (c) Describe **four** ways in which features resulting from faulting are of significance to the economy of Kenya. (8 marks)
- 9** (a) (i) Apart from alternate wetting and drying, name **three** other processes of mechanical weathering. (3 marks)
- (ii) Describe the following processes of weathering:
- alternate wetting and drying; (3 marks)
  - hydrolysis; (2 marks)
  - carbonation. (3 marks)
- (b) (i) State **three** conditions that influence the process of solifluction in mass wasting. (3 marks)
- (ii) Give **three** negative effects of mass wasting on the physical environment. (3 marks)
- (c) You are planning to carry out a field study on types of mass wasting.
- (i) Identify **three** methods you would use to collect data. (3 marks)
- (ii) Give **three** types of rapid mass wasting that you are likely to observe during the field study. (3 marks)

- (iii) State **two** ways in which the information collected during the field study would be useful to the local community. (2 marks)

10 The diagram below represents an artesian basin. Use it to answer question (a).



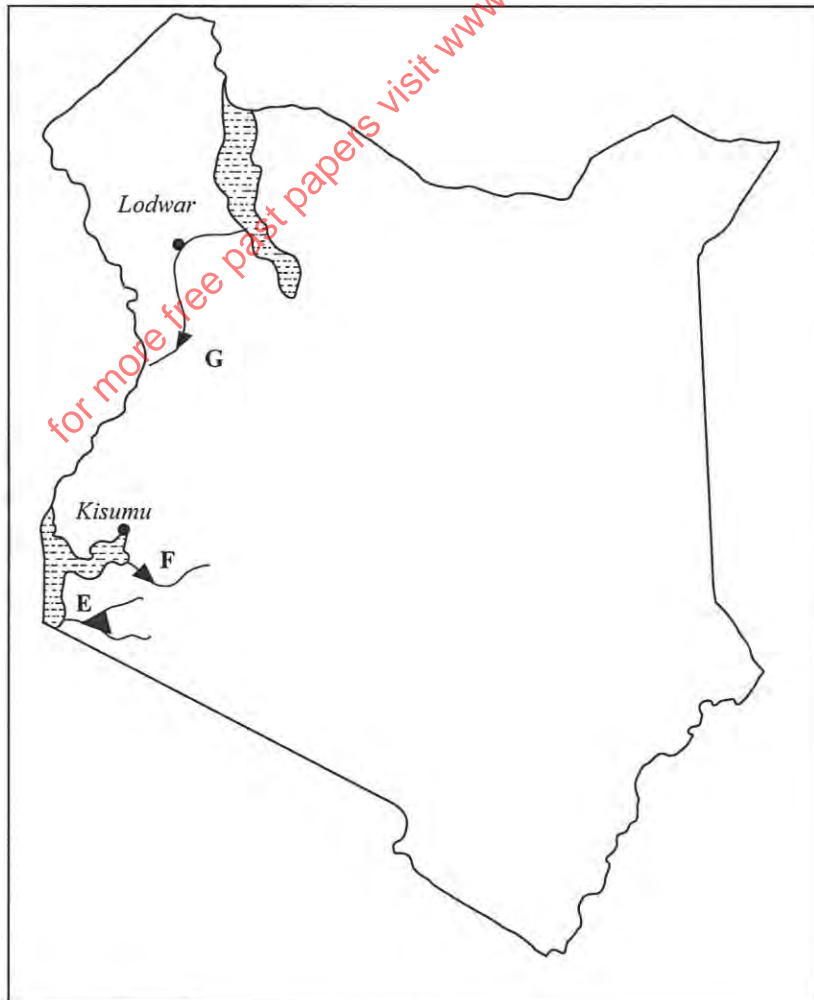
- (a) Identify:
- (i) the layers marked **X** and **Y**. (2 marks)
  - (ii) the process marked **Z**. (1 mark)
- (b) Explain how the following factors influence the amount of underground water in limestone areas:
- (i) rainfall; (4 marks)
  - (ii) vegetation cover. (4 marks)
- (c) (i) Apart from stalagmites, name **three** other underground features formed in limestone areas. (3 marks)
- (ii) With the aid of a diagram, describe how a stalagmite is formed. (8 marks)
- (d) Give **three** reasons why there are few settlements in Karst landscapes. (3 marks)

### 3.10.2 Geography Paper 2 (312/2)

#### SECTION A: (25 marks)

Answer *all* the questions in this section.

- 1 (a) Define the term environment. (2 marks)
- (b) Give **three** effects of air pollution in major urban centres. (3 marks)
- 2 (a) Identify **three** factors that influence the occurrence of minerals. (3 marks)
- (b) Name the area where the following minerals are mined in Kenya:
- (i) diatomite; (1 mark)
- (ii) salt. (1 mark)
- 3 (a) Distinguish between forest and forestry. (2 marks)
- (b) Identify **three** activities that may be undertaken in your school to conserve trees. (3 marks)
- 4 Give **four** challenges facing Nomadic pastoralism in Kenya. (4 marks)
- 5 Use the map of Kenya below to answer question (a).



- (a) Name the hydro-electric power projects marked **E**, **F** and **G**. (3 marks)
- (b) State **three** advantages of geothermal power as a source of energy. (3 marks)

**SECTION B: (75 marks)**

*Answer question 6 and any other two questions in this section.*

- 6** The table below shows the value of some of Kenya's mineral exports from 2008 to 2011. Use it to answer questions (a) and (b).

**Value of Kenya's mineral exports (Million Ksh.)**

<b>Mineral \ Year</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Soda Ash	13 200	8 300	7 300	12 400
Petroleum Products	4 200	4 500	4 700	6 100
Cement	7 300	7 800	7 400	8 900

Source: Central Bureau of Statistics

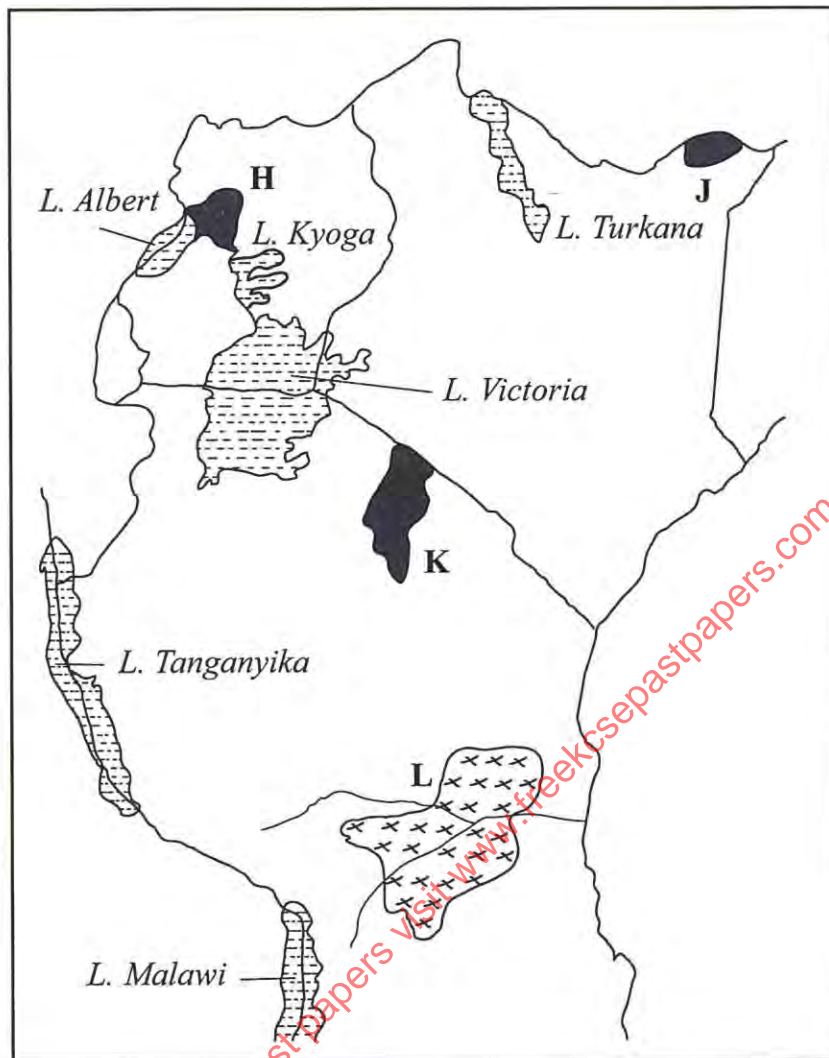
- (a) (i) Using a scale of 1 cm to represent 1 000 million Kenya Shillings, draw a comparative bar graph to represent the data shown. (8 marks)
- (ii) State **three** advantages of using comparative bar graphs to represent statistical data. (3 marks)
- (b) Calculate the percentage increase in value of exports between the years 2010 and 2011. (6 marks)
- (c) Explain the significance of trade to the economy of Kenya. (8 marks)
- 7** (a) State **three** physical conditions which favour large scale sugarcane growing in Kenya. (3 marks)
- (b) (i) Describe the stages involved in the processing of sugarcane at the factory. (6 marks)
- (ii) Give **three** by-products obtained from sugarcane. (3 marks)
- (c) Explain **three** ways in which the Kenya Government is promoting the sugar manufacturing industry. (6 marks)
- (d) Your class visited a sugarcane plantation for a field study on land preparation and planting.
- (i) Outline **four** activities that you are likely to identify. (4 marks)
- (ii) Give **three** methods you would use to record data during the field study. (3 marks)



8 (a) Differentiate between domestic and international tourism.

(2 marks)

Use the map of East Africa below to answer question (b).



(b) Name:

(i) The national parks marked **H**, **J** and **K**.

(3 marks)

(ii) The game reserve marked **L**.

(1 mark)

(c) (i) Explain how the following factors influence tourism in Kenya.

- climate;
- scenery;
- tour companies.

(2 marks)

(2 marks)

(2 marks)

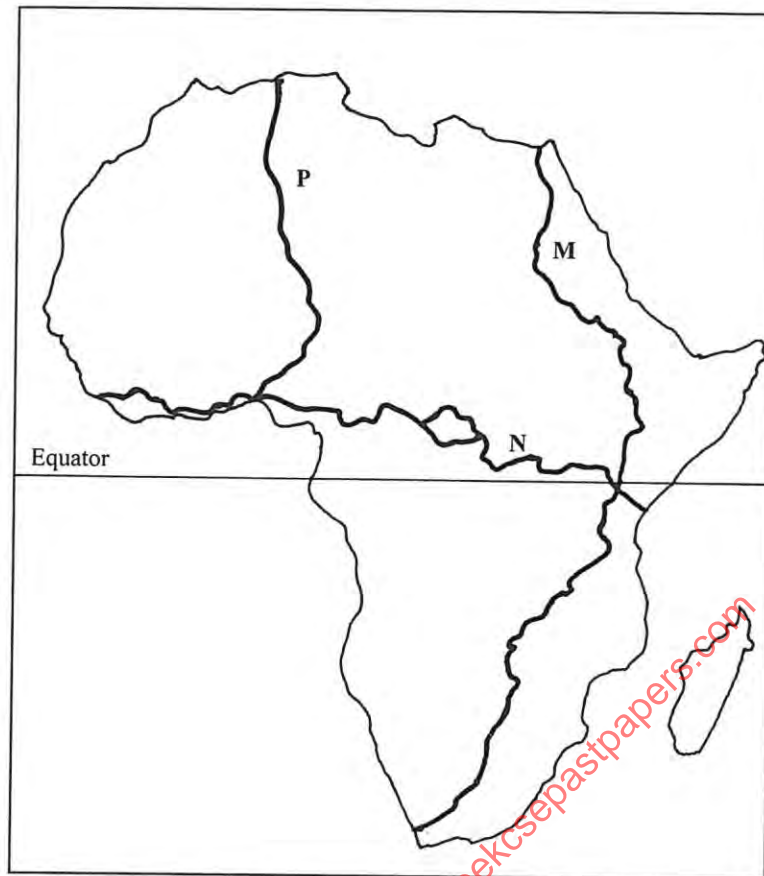
(ii) State **five** effects of floods on tourism.

(5 marks)

(d) Explain **four** ways in which the county governments in Kenya would promote sustainable tourism.

(8 marks)

9 Use the map of Africa below to answer question (a)



(a) Name the trans-continental highways in Africa marked M, N and P. (3 marks)

(b) (i) State **four** advantages of air transport. (4 marks)

(ii) Explain **four** efforts that the Kenya Government has taken to improve air transport. (8 marks)

(c) (i) Identify **two** types of communication. (2 marks)

(ii) Explain **four** problems facing communication in Africa. (8 marks)

10 (a) (i) Give **two** main sources of population data. (2 marks)

(ii) Outline the information that can be derived from a population pyramid. (3 marks)

(b) Explain how the following factors have led to population increase in Kenya

(i) cultural beliefs; (2 marks)

(ii) migration. (2 marks)

(c) Explain **four** problems which result from a high population growth rate in Kenya. (8 marks)

(d) Describe **four** ways in which the population of Kenya differs from that of Sweden. (8 marks)

### 3.11 CHRISTIAN RELIGIOUS EDUCATION (313)

#### 3.11.1 Christian Religious Education Paper 1 (313/1)

- 1 (a) State **six** similarities in the Biblical stories of creation in Genesis 1 and 2. (6 marks)
- (b) Identify the responsibilities given to human beings by God in Biblical creation stories. (8 marks)
- (c) Why should Christians in Kenya take care of the environment? (6 marks)
- 2 (a) Describe the call of Abraham (Genesis 12: 1-9). (8 marks)
- (b) Explain the characteristics of a covenant. (5 marks)
- (c) Identify **seven** examples of covenants made in Kenya today. (7 marks)
- 3 (a) Give **five** reasons why the Israelites demanded for a king. (1 Samuel 8). (5 marks)
- (b) What lessons can modern political leaders learn from King David? (7 marks)
- (c) How do Christians in Kenya demonstrate their faith in God? (8 marks)
- 4 (a) State **four** differences between traditional African prophets and the Old Testament prophets. (8 marks)
- (b) Outline the social injustices condemned by Prophet Amos in Israel. (6 marks)
- (c) In what ways is the Church in Kenya promoting justice in society? (6 marks)
- 5 (a) With reference to the teaching of Prophet Jeremiah on judgement, state **six** ways in which God would punish the people of Judah. (6 marks)
- (b) In what ways did Prophet Jeremiah suffer while carrying out his work in Judah? (6 marks)
- (c) List **eight** moral values that a Christian can acquire from the life of Prophet Jeremiah. (8 marks)
- 6 (a) List **eight** places used for worship in traditional African communities. (8 marks)
- (b) Give **six** reasons why sacrifices are made in traditional African communities. (6 marks)
- (c) How do Christians in Kenya show respect for places of worship? (6 marks)

### 3.11.2 Christian Religious Education Paper 2 (313/2)

- 1 (a) Outline Jeremiah's prophecies about the Messiah (Jeremiah 23: 5-6). (6 marks)
- (b) Describe the incident when an angel visited the shepherds on the night Jesus was born. (Luke 2: 8-15). (7 marks)
- (c) List **seven** virtues which Christians acquire while celebrating the birth of Jesus. (7 marks)
- 2 (a) Describe the incident in which Jesus raised Jairus' daughter. (Luke 8: 40-56) (7 marks)
- (b) State **six** lessons Christians learn about Jesus from the raising of Jairus' daughter. (6 marks)
- (c) How is the Church in Kenya helping the sick? (7 marks)
- 3 (a) Identify the events that took place between the death and burial of Jesus. (Luke 23: 44-56). (7 marks)
- (b) How did Jesus reveal himself to the two men going to Emmaus? (Luke 24:13 - 31). (6 marks)
- (c) Why is the resurrection of Jesus important to Christians? (7 marks)
- 4 (a) Describe the events that took place on the day of Pentecost. (Acts 2: 1-41) (8 marks)
- (b) In what ways can Christians identify those who are led by the Holy Spirit among themselves? (5 marks)
- (c) How are the gifts of the Holy Spirit manifested in the Church today? (7 marks)
- 5 (a) Identify the causes of premarital sex among the youth in Kenya today. (8 marks)
- (b) State the Christian teaching on marriage. (7 marks)
- (c) Give reasons why virginity is encouraged in both traditional African communities and Christianity. (5 marks)
- 6 (a) List **seven** ways in which wealth is acquired in traditional African communities. (7 marks)
- (b) Explain the negative effects of the introduction of money economy in traditional African communities. (7 marks)
- (c) How can Christians in Kenya help to narrow the gap between the rich and the poor? (6 marks)

### 3.12 ISLAMIC RELIGIOUS EDUCATION (314)

#### 3.12.1 Islamic Religious Education Paper 1 (314/1)

- 1 (a) Differentiate between Makkan and Madinan *Surah*. (10 marks)
- (b) State **six** reasons why the Prophet (P.b.u.h) emphasized on the recording of the Quran during his life time. (6 marks)
- (c) Give **four** attributes of Allah as mentioned in *Ayatul Kursi*. (4 marks)
- 2 (a) State **eight** teachings on slander according to *Surah An-Nur*. (8 marks)
- (b) Give **seven** reasons why mankind needed the revelation of the Quran. (7 marks)
- (c) Mention **five** teachings of *Surah Al-Fatihah*. (5 marks)
- 3 (a) Discuss the characteristics of the chain of narrators (*Isnaad*) of a *Sahih hadith*. (7 marks)
- (b) Explain the significance of hadith in the life of a Muslim. (7 marks)
- (c) The Prophet (P.b.u.h) said “Do not be angry”  
In reference to the above hadith, state **six** ways through which Muslims can manage anger. (6 marks)
- 4 (a) Explain **four** differences between *Sijdatul Shukr* and the *Sijda* performed in *Swalat*. (8 marks)
- (b) Suggest **six** ways in which the collection and distribution of *Zakat* in Kenya can be improved. (6 marks)
- (c) What is the importance of *saum* in the life of a Muslim? (6 marks)
- 5 (a) Discuss the significance of *Tawba*. (10 marks)
- (b) Outline **five** achievements of Imam Malik as a Muslim jurist. (5 marks)
- (c) State **five** conditions which necessitate the performance of *ghusl*. (5 marks)
- 6 (a) State **eight** characteristics of the angels of Allah (s.w.t). (8 marks)
- (b) Identify **seven** duties of the prophets of Allah (s.w.t). (7 marks)
- (c) Write **five** holy scriptures in the **correct** order in which they were revealed. (5 marks)

### 3.12.2 Islamic Religious Education Paper 2 (314/2)

- 1 (a) State **eight** remedies recommended by Islam to control the spread of HIV and AIDs. (8 marks)
- (b) Give **seven** reasons why Muslims are discouraged from engaging in vain talks. (7 marks)
- (c) Explain the rationale for the prohibition of Khat (miraa) in Islam. (5 marks)
- 2 (a) Give **seven** reasons why the Prophet (P.b.u.h) married more than one wife. (7 marks)
- (b) State **seven** rights of a child in Islam. (7 marks)
- (c) What are the differences between the eddat of a widow and the eddat of a divorced woman? (6 marks)
- 3 (a) Describe **seven** benefits of keeping records in business transactions according to Islamic teachings. (7 marks)
- (b) State **seven** rules governing money lending in Islam. (7 marks)
- (c) Identify **six** causes of corruption in the society. (6 marks)
- 4 (a) Discuss **four** challenges faced by Khalifa Abubakar (R.A) during his reign. (8 marks)
- (b) What lessons can Muslims learn from the battle of Khandaq? (6 marks)
- (c) State **six** effects of the social boycott imposed on the Muslims by the Quraish. (6 marks)
- 5 (a) Explain **four** differences between the Hijrah to Abbysinia and the Hijrah to Madina. (8 marks)
- (b) Outline **six** achievements of Harun Ar-Rasheed of the Abbasids. (6 marks)
- (c) State **six** factors responsible for the spread of Islam in North Eastern Kenya up to the Twentieth Century. (6 marks)
- 6 (a) In what ways did Prophet Muhammad (P.b.u.h) advocate for the improvement of the status of women? (7 marks)
- (b) Describe **seven** lessons that Muslim youth can learn from Imam Ghazali's rules of conduct. (7 marks)
- (c) State the role played by Muslims in the political development of Kenya since independence. (6 marks)

### 3.13 HOME SCIENCE (441)

#### 3.13.1 Home Science Paper 1 (441/1)

##### SECTION A: (40 marks)

*Answer ALL the questions in this section in the spaces provided.*

- 1 Define the following terms as used in meal planning: (2 marks)
  - (a) blanch;
  - (b) essence.
- 2 State **two** reasons for basting foods while cooking. (2 marks)
- 3 Give **two** uses of carbohydrates in the body. (2 marks)
- 4 State **two** ways of conserving vitamin C in green leafy vegetables during preparation. (2 marks)
- 5 Highlight **two** disadvantages of réchauffé dishes. (2 marks)
- 6 Name **two** waterborne diseases caused by poor sanitation. (1 mark)
- 7 State **two** ways of enhancing personal appearance. (2 marks)
- 8 Identify **two** ways of meeting the emotional needs of a patient recuperating at home. (2 marks)
- 9 Distinguish between a cesspool and a soak pit. (2 marks)
- 10 Name **four** locally available materials that can be used to improvise cleaning abrasives. (2 marks)
- 11 State **two** advantages of regular cleaning of household items. (2 marks)
- 12 State **two** factors to consider when caring for a pit latrine. (2 marks)
- 13 Differentiate between a need and a want. (1 mark)
- 14 Highlight **two** advantages of having labels on consumer products. (2 marks)
- 15 Name **two** examples of builders added to soaps and soapless detergents during manufacture. (1 mark)
- 16 Give the main reason for repairing clothes before laundering. (1 mark)
- 17 State **two** advantages of using soft water in laundry work. (2 marks)

- 18 Give **three** points to consider when selecting the fabric to use when practising stitching for beginners. (3 marks)
- 19 Outline **two** reasons for blending fibres. (2 marks)
- 20 State **two** factors to consider when fixing a zip on a garment. (2 marks)
- 21 Identify **three** ways of attaching a collar to the neckline. (3 marks)

**SECTION B: (20 marks)**

**COMPULSORY**

*Answer Question 22 in the spaces provided.*

- 22 You are at home over the weekend. Outline the procedure you would use for each of the following:
- (i) laundering a woollen sweater; (11 marks)
  - (ii) cleaning a stainless steel sink; (5 marks)
  - (iii) cleaning an enamel cup. (4 marks)

**SECTION C: (40 marks)**

*Answer any TWO questions from this section in the space provided after question 25 (c).*

- 23 (a) Explain **three** general rules to observe when making batters. (6 marks)
- (b) Outline **six** reasons for including fruit salad in a meal. (6 marks)
- (c) Explain how the following factors influence consumer buying:
- (i) inflation;
  - (ii) family set up;
  - (iii) time and energy;
  - (iv) self image. (8 marks)
- 24 (a) Outline **four** qualities of a well made cuff. (4 marks)
- (b) Classify laundry equipment and in each case give **two** examples. (8 marks)
- (c) Explain **four** factors to consider when choosing a seam in garment construction. (8 marks)
- 25 (a) Highlight **four** pieces of information found on a receipt of goods sold. (4 marks)
- (b) Explain **four** ways of ventilating a room using windows. (8 marks)
- (c) Explain **four** factors that may affect normal foetal development. (8 marks)



### 3.13.2 Home Science Paper 2 (441/2)

A pattern of a pair of shorts is provided. You are advised to study the sketches, instructions and the layout carefully before you begin the test.

#### Materials Provided

1. Pattern Pieces
  - A. Short front
  - B. Short back
  - C. In-seam pocket
  - D. Waistband
2. Plain light weight cotton fabric 60cm long and 90cm wide.
3. Sewing thread to match.
4. One large envelope.

#### THE TEST

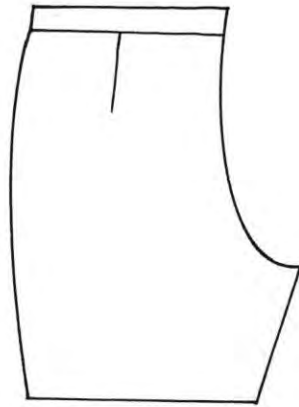
Using the materials provided, lay, cut out and make the **LEFT LEG** of the pair of shorts to show the following processes:

- (a) Cutting out. (9 marks)
- (b) Making of the back dart. (8 marks)
- (c) Attaching the in-seam pocket. (16 marks)
- (d) Working of the side seam using an open seam. (Above and below the pocket seam). (9½ marks)
- (e) Working of the inner leg seam using a double stitched seam. (8 marks)
- (f) Making the knife pleats on the short front and attaching the waistband. (Do not interface) (20 marks)
- (g) Complete half of the waistband using hemming stitches. (3 marks)
- (h) Managing the hem of the short by holding it in place using tacking stitches. (10 marks)
- (i) Overall presentation. (6½ marks)

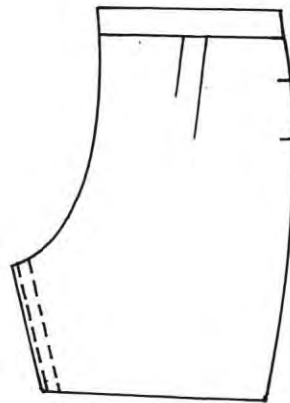
At the end of the examination, firmly sew onto your work, on a single fabric, a label bearing your name and index number. Remove the needle, pins and loose threads from your work. Fold your work neatly and place it in the envelope provided.

Do not put scraps of fabric in the envelope.

# SHORT VIEW

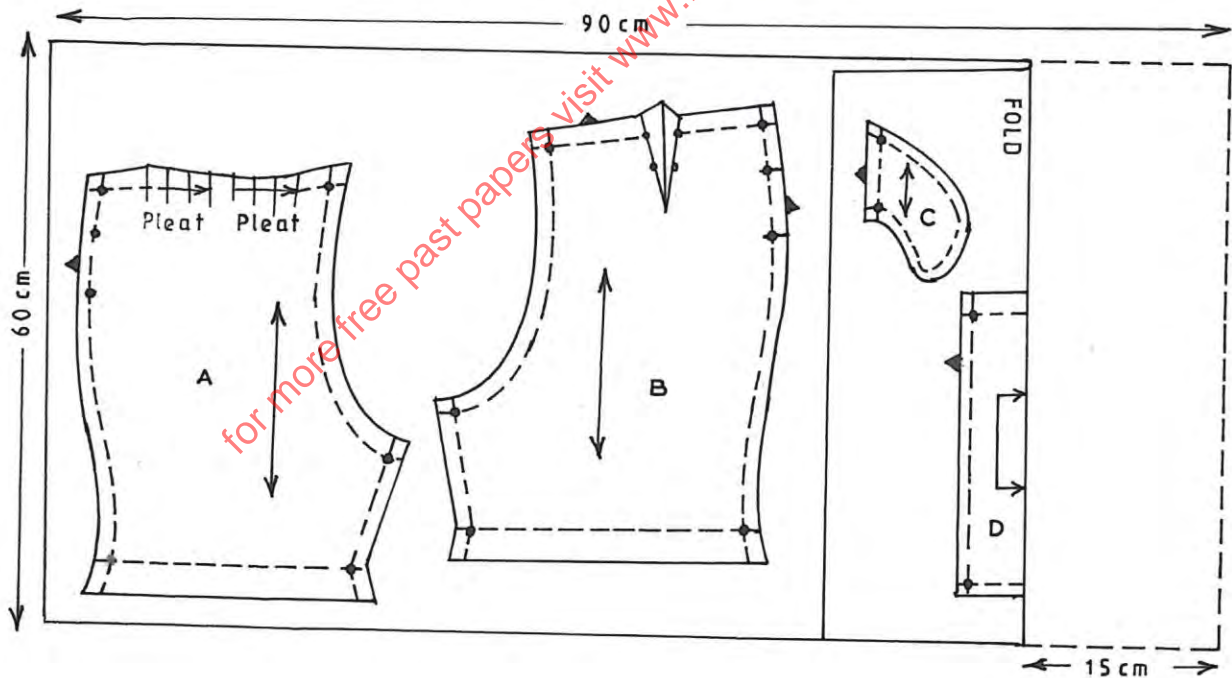


BACK



FRONT

## LAYOUT ( Not drawn to scale )



### 3.13.3 Home Science (Food and Nutrition) Paper 3 (441/3)

#### THE TEST

You have been contracted by a catering firm to provide lunch for manual workers at a construction site.

Using the ingredients listed below:

- (i) prepare, cook and present a one course meal for two manual workers.
- (ii) prepare and present a nutritious drink for two manual workers.

#### Ingredients:

- Maize flour/green bananas/rice
- Beef/beans
- Green leafy vegetables/cabbage
- Tomatoes
- Carrots
- Onions
- Fat/oil
- Salt
- Margarine
- Sugar
- Fruits in season.

#### PLANNING SESSION - 30 minutes

For each task listed below, use separate sheets of paper and make duplicate copies using carbon paper.

Proceed as follows:

1. Identify the dishes and write the recipes;
2. Write your order of work;
3. Make a list of the foodstuff and equipment you will require.

3.14 ART & DESIGN (442)

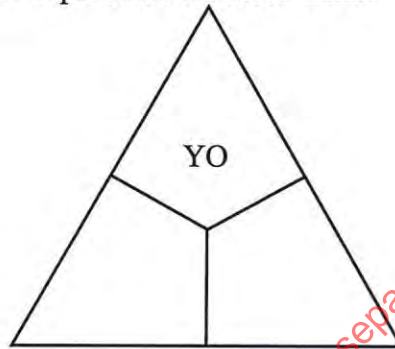
3.14.1 Art & Design Paper 1 (442/1)

SECTION A (20 marks)

Answer *ALL* the questions in this section in the spaces provided.

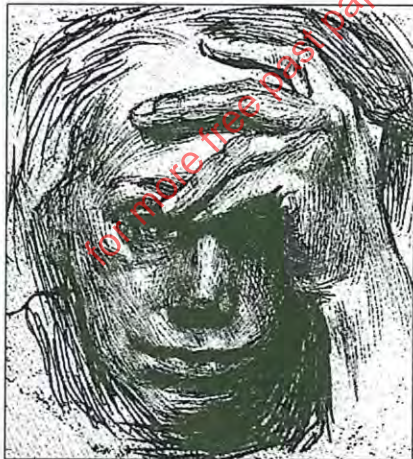
- 1 (a) “Art and Design forms a good base for every subject in the curriculum”. Explain the statement. (2 marks)

- (b) The illustration below represents a colour triad.



Fill in the missing colours. (2 marks)

- (c) Explain the terms recede and advance as applies to colour. (2 marks)
- (d) State the mood portrayed in the artwork below. (1 mark)



- (e) A student had a collection of newspapers and magazines intending to use them to create a pictorial composition. Name the **two** picture making techniques the student could use. (2 marks)

- (f) Name **two** types of balance prominent in the illustration below. (2 marks)



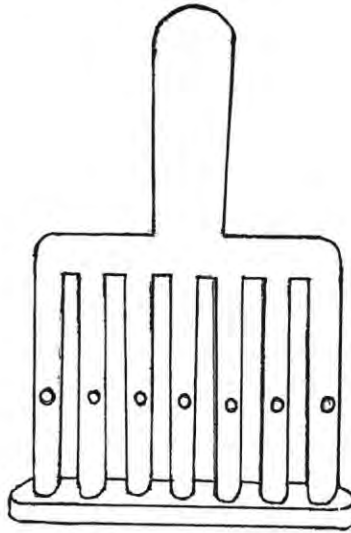
- (g) Distinguish between Dabbing and Airbrushing in painting. (2 marks)
- (h) Explain **two** roles of packaging design. (2 marks)
- (i) Differentiate between a slip and press mould in sculpture. (2 marks)
- (j) Name the dry point print making process used to create half tones. (1 mark)
- (k) Explain why shellac is preferred to varnish in serigraphy. (1 mark)
- (l) State the importance of spacers in design and production of ornaments. (1 mark)

**SECTION B** (25 marks)

*Answer ALL the questions from this section in the spaces provided.*

- 2** Write the word “**day**” in uppercase and label the apex, counter and crossbar. (5 marks)
- 3**
- (a) Explain the term “caricature”. (1 mark)
- (b) State **two** characteristics of a caricature. (2 marks)
- (c) What is the significance of a caricature to visual communication? (2 marks)

4 The illustration shows a tool used in an Art technique.



- (a) Identify the technique. (1 mark)
- (b) Name the tool. (1 mark)
- (c) Explain **three** functions of the tool. (3 marks)

5 Outline **five** steps involved in open firing of clay articles. (5 marks)

6 State **five** factors that determine choice of material in ornament making. (5 marks)

### SECTION C (15 marks)

*Answer any ONE question from this section.*

*Write your answers in the space provided after question 9.*

7 Giving **two** points for each, explain the following eye views as applied in perspective.

- (a) (i) worms eye view; (2 marks)  
(ii) normal eye view; (2 marks)  
(iii) bird's eye view. (2 marks)

(b) Draw and label a classroom desk in two-point perspective. (9 marks)

8 (a) Name the technique in which the term "lost wax" is used. (1 mark)

(b) State **five** merits and **two** limitations of each of the following sculpture making techniques:

- (i) modelling; (7 marks)  
(ii) construction. (7 marks)

9

The illustration below represents a motif printed using a linoleum block.



- (a) Sketch the motif as it would appear on the block. (1 mark)
- (b) Identify and label the positive and negative areas. (2 marks)
- (c) Using a single block, describe the process of producing a wall hanging on paper in two colours.

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### 3.14.2 Art & Design Paper 2 Practical (442/2)

Answer only *ONE* question chosen from *EITHER* alternative A *OR* alternative B.

#### ALTERNATIVE A: DRAWING OR PAINTING

You are instructed that the use of rulers and other mechanical devices is *forbidden* in this alternative.

#### EITHER

##### DRAWING

- 1 In pencil or pen and ink, create a composition based on an arrangement of the objects listed below.
- a rake
  - pair of gumboots
  - wheel barrow
  - log of wood
  - a rope
  - whole bunch of bananas.

The composition should measure 35cm by 45cm.

OR

##### PAINTING

- 2 Create a pictorial composition based on the following description:

Students are telling stories in class during prep time when suddenly the teacher appears at the door. There is a scuffle as students dash back to their desks. Depict the drama.

The working area should be 35cm by 45cm.



## ALTERNATIVE B: GRAPHIC DESIGN

*You are instructed that the use of rulers and other mechanical devices as well as tracing paper is allowed.*

*The colour of the working surface (paper) will not be considered as one of the colours required in any question.*

### EITHER

- 3 A newly established company, “Colour Pot” dealing with paint products and equipment requires a signage to be placed at the entrance of their premises.

In not more than **three** colours, design the signage for the company to include the name, trademark and an illustration. The work should be within an area of 35cm by 45cm.

### OR

- 4 A Non Governmental Organisation (NGO) dealing with environmental conservation requires a brochure to sensitise the Youth on recycling of plastics.

In not more than **three** colours, design a **three** panel illustrated brochure showing the inside and outside spreads.

The brochure should measure 19cm by 27cm.

### 3.15 AGRICULTURE (443)

#### 3.15.1 Agriculture Paper 1 (443/1)

#### SECTION A (30 marks)

*Answer all the questions in the spaces provided.*

- 1 State **four** reasons for applying phosphatic fertilizers during planting. (2 marks)
- 2 Give **four** ways in which crop pests are classified. (2 marks)
- 3 State **four** advantages of landlordism and tenancy. (2 marks)
- 4 Differentiate between apiculture and aquaculture. (1 mark)
- 5 State **four** factors that affect the quality of farm-yard manure. (2 marks)
- 6 Give **four** reasons why seed propagation is encouraged in crop production. (2 marks)
- 7 State **four** factors that can make a farmer choose a jembe for primary tillage. (2 marks)
- 8 Give **four** factors that affect the quality of hay. (2 marks)
- 9 Name **five** entries that can be made on a cattle breeding record. (2½ marks)
- 10 Give **two** reasons for testing soil. (1 mark)
- 11 Name **three** forms of horticulture practised in Kenya. (1½ marks)
- 12 Give **two** reasons for constructing a shade over a nursery. (1 mark)
- 13 Name **four** appropriate sites for agroforestry trees. (2 marks)
- 14 State **four** personal safety measures a farmer should consider when handling herbicides. (2 marks)
- 15 Give **two** reasons why a maize plant growing in a cabbage crop field may be treated as a weed. (1 mark)
- 16 Name **four** classes of weeds. (2 marks)
- 17 State **four** agricultural activities that may pollute water. (2 marks)

**SECTION B (20 marks)**

*Answer all the questions in the spaces provided.*

**18** A farmer applied a compound fertilizer 10:20:0 on a three hectares piece of land at a rate of 180kg N per hectare.

- (a) Calculate the quantity of the compound fertilizer the farmer applied on the piece of land. (3 marks)
- (b) What do the figures 10 and 20 stand for in the compound fertilizer? (2 marks)

**19** The diagram below illustrates a nursery practice.



- (a) Identify the practice. (1 mark)
- (b) Describe the procedure followed in carrying out the practice illustrated. (2 marks)
- (c) State **two** advantages of the practice illustrated above in crop production. (2 marks)

**20** The diagram below shows crop establishment using a certain method of planting.



- (a) Name the method of planting used for the crop. (1 mark)
- (b) State **two** advantages of the planting method used for the crop. (2 marks)
- (c) Explain **two** factors that determine the depth of planting. (2 marks)

21 Below is a diagram showing a crop disease.



- (a) Identify the crop disease. (1 mark)
- (b) State **three** control measures for the crop disease. (3 marks)
- (c) Name the category in which the crop disease is classified. (1 mark)

**SECTION C (40 marks)**

*Answer any two questions from this section in the spaces provided after question 24.*

- 22 (a) Explain how each of the properties of rainfall and light influence crop production. (8 marks)
- (i) rainfall; (4 marks)
- (ii) light. (4 marks)
- (b) Describe rice production under the following sub-headings:
- (i) land preparation; (2 marks)
- (ii) water control; (2 marks)
- (iii) fertilizer application; (2 marks)
- (iv) weed control. (2 marks)
- 23 (a) Explain **five** factors that can increase the demand for tea on a market. (10 marks)
- (b) State **four** ways of improving labour productivity on the farm. (4 marks)

- (c) The following information was obtained from Upendo Farm inventory on 1st January 2013.

ITEM	VALUE (Ksh)
Layers	80,000
Beef cattle	240,000
Beans in store	40,000
Cash at hand	15,000
Land	550,000
Machinery	250,000
Buildings	310,000
Calves	75,000

On the same day the farm recorded the following:

ITEM	VALUE (Ksh)
Wages payable	5,000
Interest payable	8,000
Bank loan	723,000
Milk sales on credit	12,000
Chicken sales on credit	6,000
Cash in bank	52,000
Purchase of fertilizer on credit	26,000
Taxes payable	3,000

Using the information provided prepare a balance sheet for Upendo Farm. (6 marks)

- 24 (a) Describe the field management practices for tomatoes. (12 marks)
- (b) Describe **four** types of soil erosion by water. (8 marks)

### 3.15.2 Agriculture Paper 2 (443/2)

#### SECTION A (30 marks)

*Answer ALL the questions in this section in the spaces provided.*

- 1 Name **four** rabbit breeds reared in Kenya. (2 marks)
- 2 State **four** characteristics of desirable eggs for marketing. (2 marks)
- 3 Name **two** types of roughage. (1 mark)
- 4 Give **four** disadvantages of inbreeding in livestock. (2 marks)
- 5 Name the nutritional deficiency for each of the following livestock diseases:
  - (a) milk fever; ..... ( $\frac{1}{2}$  mark)
  - (b) bloat. .... ( $\frac{1}{2}$  mark)
- 6 Give **two** reasons for docking in sheep rearing. (1 mark)
- 7 State **four** signs of fowl typhoid. (2 marks)
- 8 Differentiate between drift and pen lambing. (2 marks)
- 9 State **four** features on the animal which may predispose it to livestock diseases. (2 marks)
- 10 Give **four** factors that affect milk composition. (2 marks)
- 11 State **two** control measures for keds in sheep. (1 mark)
- 12 State **two** maintenance practices carried out on a greenhouse structure. (1 mark)
- 13
  - (a) Name the goat breed which is brown in colour with white strips running down the face to the nose. ( $\frac{1}{2}$  mark)
  - (b) State **four** rearing practices that necessitate handling of piglets. (2 marks)
- 14 Give **four** preventive measures for livestock diseases. (2 marks)
- 15 State **one** function of each of the following parts during egg formation in poultry:
  - (a) funnel; (1/2 mark)
  - (b) magnum; (1/2 mark)
  - (c) isthmus. (1/2 mark)

16 The following is a list of poultry breeds:

White Leghorn  
Light Sussex  
Rhode Island Red  
Ancona.

Categorize them into:

(a) light breeds; (1 mark)

(b) heavy breeds. (1 mark)

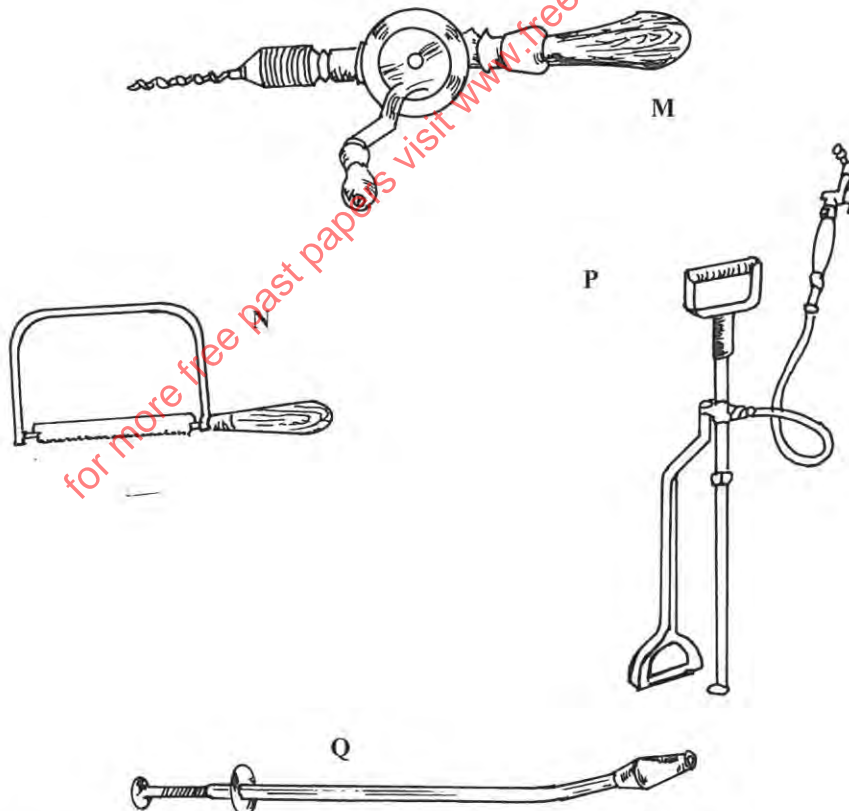
17 State **two** functions of a queen in a bee colony. (1 mark)

18 State **four** maintenance practices carried out on a fish pond. (2 marks)

**SECTION B: (20 marks)**

Answer **ALL** the questions in this section in the spaces provided.

19 The diagrams below represent some farm tools and equipment. Study them and answer the questions that follow.



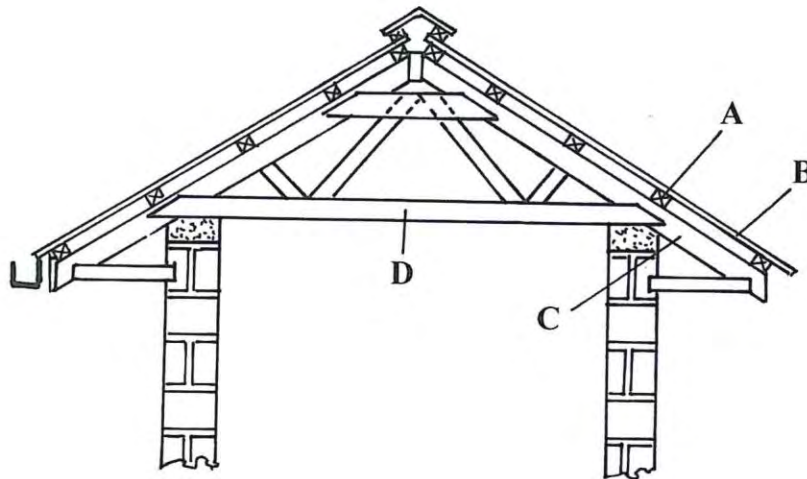
(a) Identify the tools labelled N and P.

N ..... (1 mark)

P ..... (1 mark)

(c) Explain **one** maintenance practice carried out on the equipment labelled **P**. (1 mark)

20 The diagram below represents parts of a roof.



(a) Identify the parts labelled **A** and **C**.

**A** ..... (1 mark)

**C** ..... (1 mark)

(b) State **two** types of materials that may be used for the part labelled **D**. (2 marks)

(c) Give **one** disadvantage of using thatch for the part labelled **B**. (1 mark)

21 The diagram below illustrates an internal parasite of livestock.



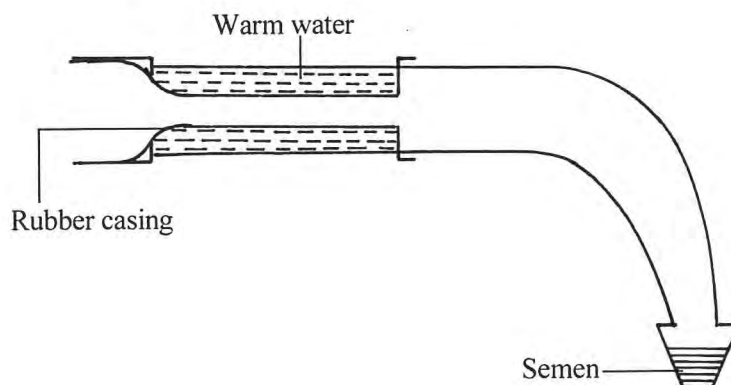
(a) Identify the parasite. (1 mark)

(b) Name **two** common species of the parasite illustrated above. (2 marks)



- (c) State **two** signs of worm infestation that may be observed in the dung of livestock. (2 marks)

22 Below is a diagram illustrating an instrument used in cattle breeding.



- (a) Identify the instrument. (1 mark)
- (b) State the role of the instrument in cattle breeding. (1 mark)
- (c) When would it be appropriate to serve a cow after the onset of heat? (1 mark)
- (d) Apart from the method in which the above instrument is used, name **two** other methods of serving a cow. (2 marks)

### SECTION C: (40 marks)

Answer any **TWO** questions from this section in the spaces provided after **question 25**.

- 23 (a) Give the functions of any **five** parts of a poultry egg. (10 marks)
- (b) Describe the uses of **five** materials/equipment required for hand milking. (10 marks)
- 24 (a) Describe East Coast fever under the following sub-headings:
- (i) livestock affected; (1 mark)
- (ii) vector and causal organism; (2 marks)
- (iii) signs of attack; (5 marks)
- (iv) control measures. (2 marks)
- (b) Describe the activities that take place during the digestion process in the rumen. (5 marks)
- (c) Describe the management practices that ensure proper hygiene in a deep litter poultry house. (5 marks)
- 25 (a) State **five** signs of external parasite infestation in livestock. (5 marks)
- (b) Explain **five** factors that should be considered when siting a farm store. (5 marks)
- (c) Describe the cycle of a four stroke petrol engine. (10 marks)

### 3.16 WOODWORK (444)

#### 3.16.1 Woodwork Paper 1 (444/1)

#### SECTION A (40 marks)

*Answer ALL the questions in this section in the spaces provided.*

- 1 Outline **four** features common to all saws. (4 marks)
- 2 Differentiate between wood carving and wood turning. (2 marks)
- 3 State **two** safety precautions to be observed for each of the following activities: (4 marks)
  - (a) carrying hand tools;
  - (b) storing hand tools.
- 4 State **four** effects of using unseasoned wood. (4 marks)
- 5 List **two** functions of each of the following parts of a tree:
  - (a) roots; (2 marks)
  - (b) trunk. (2 marks)
- 6 Using pictorial sketches, show the following:
  - (a) double tenon; (2 marks)
  - (b) twin tenon. (2 marks)
- 7
  - (a) State **two** advantages of using a roller in painting. (2 marks)
  - (b) Sketch and label a wooden veneer hammer. (3 marks)
- 8 Describe **two** methods used to prevent splitting of wood at the back when boring. (4 marks)
- 9
  - (a) State **two** precautions to be observed when working with a steel tape. (2 marks)
  - (b) List **four** factors that influence the selection of a finish. (2 marks)

10 Figure 1 shows a plane figure.

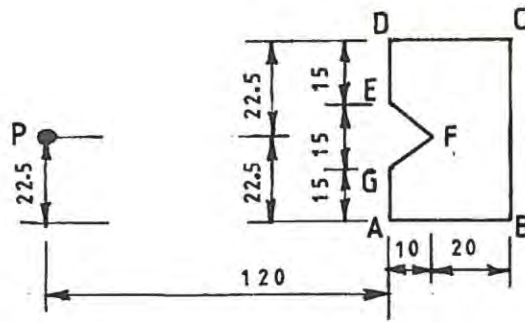


Figure 1

Copy the figure and construct a similar figure with the sides reduced in the ratio of 2:1. Use point 'P' as the focal point. (5 marks)

SECTION B (60 marks)

Answer question 11 on A3 paper provided and any other **THREE** questions from this section in the spaces provided after question 15. Candidates are advised **NOT** to spend more than 25 minutes on question 11.

11 Figure 2 shows three views of a shaped block drawn in 1<sup>st</sup> angle projection.

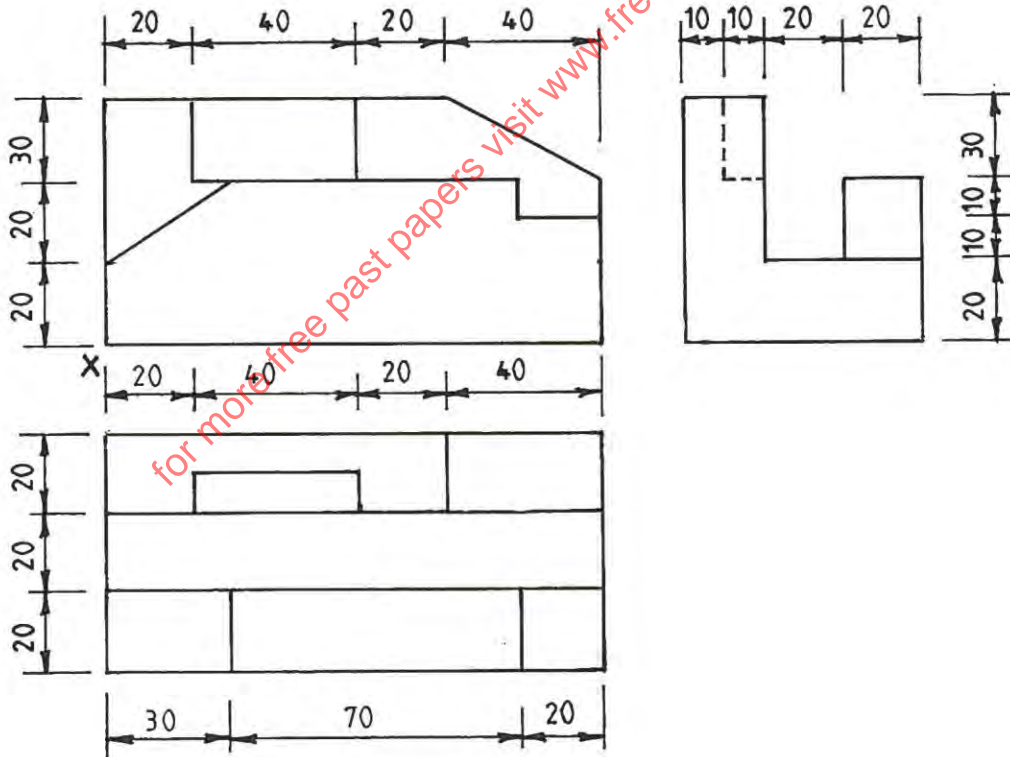
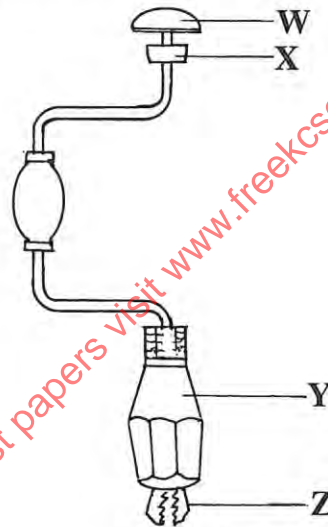


Figure 2

To a scale of 1:1, draw the block in isometric taking 'X' as the lowest point. (15 marks)

- 12 (a) State **six** characteristics of a laquer. (3 marks)
- (b) With the aid of a labelled sketch, outline the use of a test strip in preparation for staining a work piece. (9 marks)
- (c) Describe **two** types of spokeshave. (3 marks)
- 13 (a) Explain the cutting action of a cross-cut saw teeth. (6 marks)
- (b) With the aid of sketches, describe the following techniques of matching veneers:
- (i) book matching;
- (ii) slip matching;
- (iii) diamond matching. (9 marks)

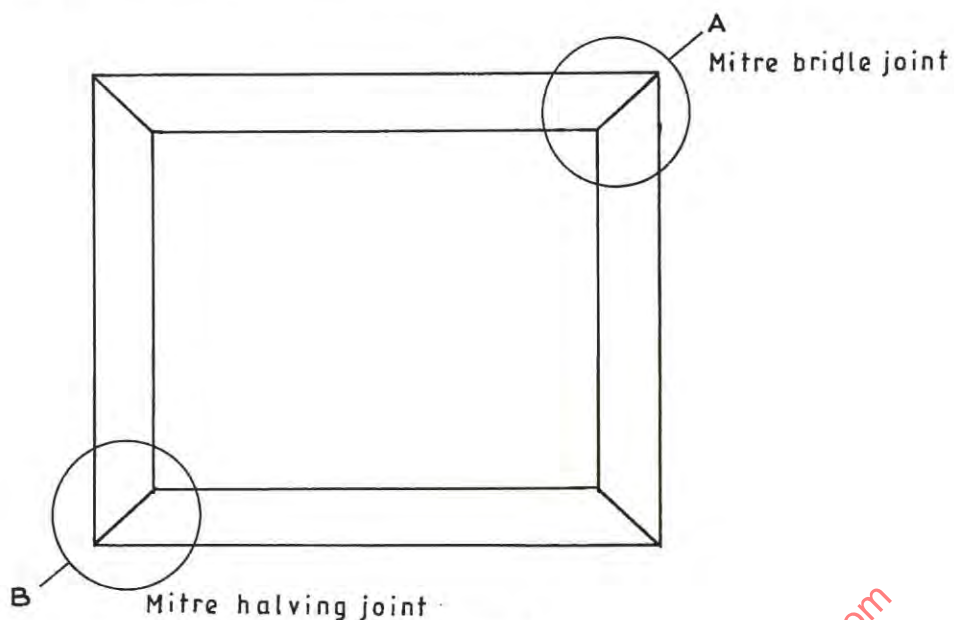
- 14 (a) **Figure 3** shows a tool used in woodwork.



**Figure 3**

- (i) Name the tool;
- (ii) Name the parts labelled **W**, **X**, **Y** and **Z**.
- (iii) State **one** function of each of the parts labelled **W**, **X**, **Y** and **Z**. (9 marks)
- (b) List **four** areas of study in woodwork after studying woodwork in high school. (2 marks)
- (c) State **four** mistakes to avoid when giving first aid treatment for simple burns. (4 marks)

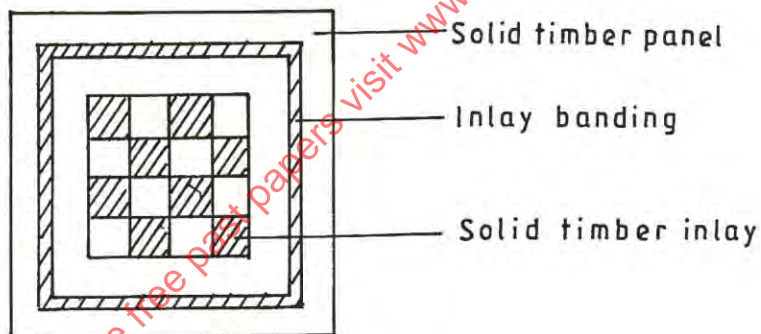
- 15 (a) **Figure 4** shows a picture frame.



**Figure 4**

Sketch an exploded view of the joints labelled **A** and **B**. (4 marks)

- (b) **Figure 5** shows the plan of solid timber panel of a stool decorated with a solid timber inlay and banding.



**Figure 5**

Outline the procedure of making the decorative panel from strips of timber of different colours in the:

- (i) banding;
- (ii) inlay.

(11 marks)

### 3.17 METALWORK (445)

#### 3.17.1 Metalwork Paper 1 (445/1)

#### SECTION A (40 marks)

*Answer all questions in this section in the spaces provided.*

- 1 (a) Name **four** career training programmes in metalwork. (2 marks)
- (b) Define the term “self employment”. (1 mark)
- 2 (a) Name **three** types of cold chisels and give **one** use of each. (3 marks)
- (b) List **six** operations that can be performed on a drilling machine. (3 marks)
- 3 (a) Give **two** reasons in each case why the following should be avoided in the workshop:
- (i) long hair;
- (ii) long nails. (2 marks)
- (b) State **four** factors to consider in order to obtain strong brazed joints. (2 marks)
- 4 (a) State the use of the following instruments:
- (i) vernier protractor;
- (ii) vernier height gauge. (2 marks)
- (b) State the function of the following parts of a micrometer screw gauge:
- (i) ratchet;
- (ii) spindle. (1 mark)
- 5 Define the following properties of metals giving **one** example of a metal with the property:
- (a) malleability;
- (b) toughness;
- (c) plasticity. (3 marks)
- 6 (a) State **three** advantages of oxy-acetylene welding over other methods of welding. (3 marks)
- (b) Give **two** reasons for rounding off the tip of a lathe cutting tool bit. (1 mark)

- 7 (a) With the aid of a labelled sketch, illustrate the hollowing process. (4 marks)
- (b) State the use of marking agents and name any **two**. (2 marks)
- 8 (a) List **three** tempering techniques used in heat treatment. ( $1\frac{1}{2}$  marks)
- (b) Define the term “point of recalescence” as used in heat treatment. ( $1\frac{1}{2}$  marks)
- 9 (a) The diameter of a snap head rivet is 4 mm. Determine the projection allowance required to form the head when riveting. (1 mark)
- (b) State the defects caused by each of the following in riveting:
- (i) failure to use a rivet set;
- (ii) too much rivet shank projecting. (2 marks)
- 10 (a) Outline the procedure of bluing as a metal finishing process. (2 marks)
- (b) Use sketches to illustrate upsetting as a forging process. (3 marks)

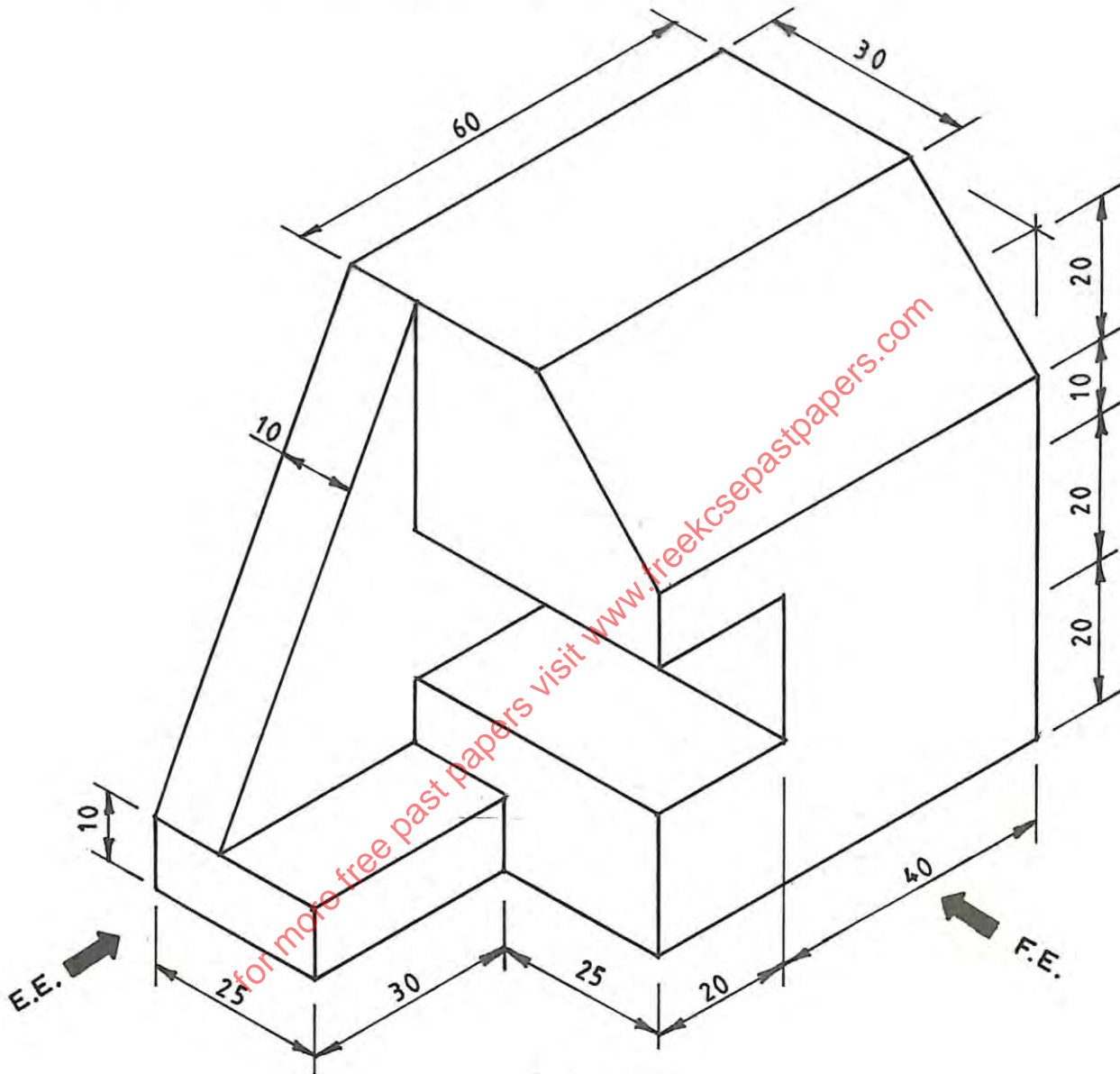
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SECTION B (60 marks)

Answer **question 11** on the A3 paper provided and any other **three** questions from this section in the spaces provided.

Candidates are advised to spend **not more than 25 minutes** on question 11.

**11** **Figure 1** shows an isometric drawing of a block.



**Fig. 1**

Draw the following views **full size** in first angle projection:

- (a) front elevation in the direction of arrow F.E;
- (b) end elevation in the direction of arrow E.E;
- (c) the plan.

(15 marks)



12 **Figure 2** shows a drawing of a bench drilling machine.

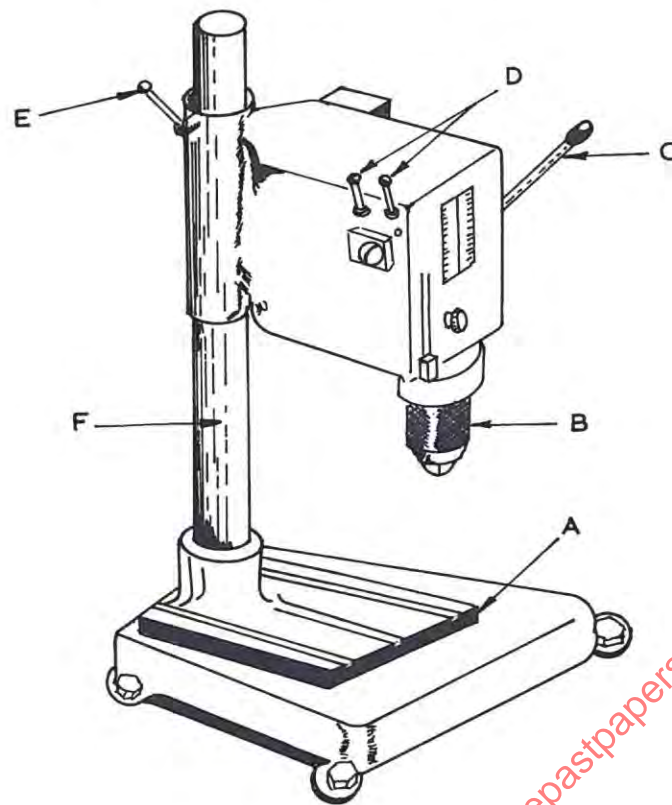


Fig. 2

- (a) Name the parts labelled A, B, C, D, E, F and state **one** function of each. (6 marks)
- (b) Outline **three** safety precautions to observe when using the machine. (3 marks)
- (c) Explain the relationship between the following:
- (i) speed and feed;
  - (ii) speed and drill diameter;
  - (iii) feed and material.
- (6 marks)

13 **Figure 3** shows a working drawing of a spanner to be made from a mild steel plate  $122 \times 42 \times 4\text{mm}$ .

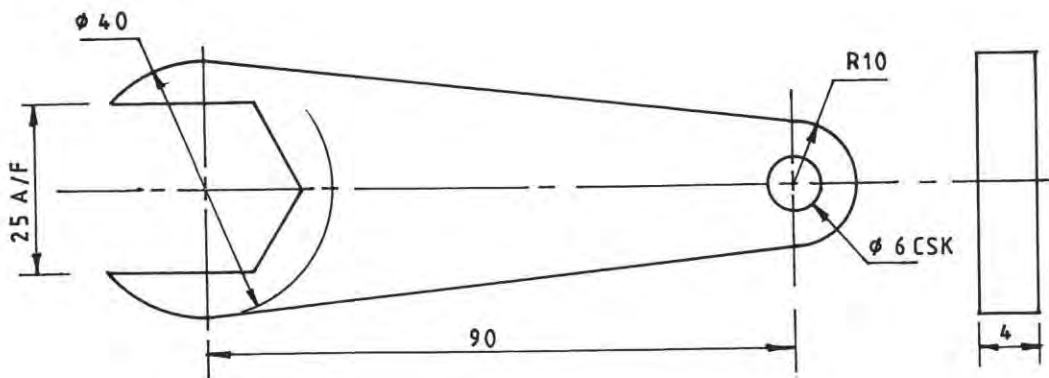


Fig. 3

Outline the procedure of:

- (a) marking the size of spanner; (8 marks)
- (b) making the spanner; (5 marks)
- (c) case hardening the spanner. (2 marks)

14 **Figure 4** shows a component to be produced on a lathe machine.

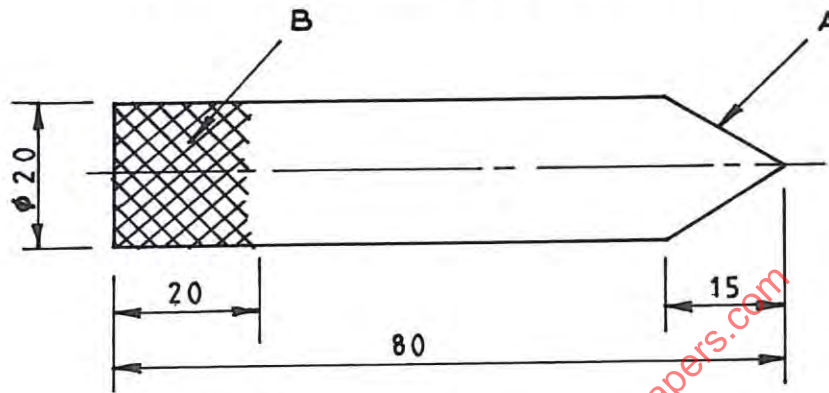


Fig. 4

- (a) Identify the details at:
  - (i) point A;
  - (ii) point B. (1 mark)
- (b) Use labelled sketches to show the set up of the workpiece on the lathe machine to produce:
  - (i) detail A; (7 marks)
  - (ii) detail B. (7 marks)

- 15
- (a) With the aid of sketches, distinguish between square and round hollow tongs. (5 marks)
  - (b) State **four** uses of a swage block. (2 marks)
  - (c) With reference to brazing, outline the procedure of:
    - (i) lighting the blow pipe; (5 marks)
    - (ii) shutting down the equipment. (3 marks)

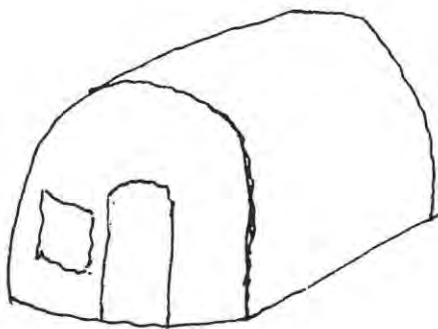
### 3.18 BUILDING CONSTRUCTION (446)

#### 3.18.1 Building Construction Paper 1 (446/1)

#### SECTION A (40 marks)

Answer **ALL** the questions in this section in the spaces provided.

- 1 (a) State **two** requirements for safe storage of each of the following items: (2 marks)
- (i) tools;
  - (ii) materials.
- (b) Explain the following terminologies as used in setting out: (2 marks)
- (i) baseline;
  - (ii) site datum.
- 2 (a) Distinguish between tamping and screeding as used in concreting. (2 marks)
- (b) State **one** disadvantage of using each of the following materials for damp-proofing: (2 marks)
- (i) polythene paper;
  - (ii) bituminous felt.
- 3 (a) Draw a pictorial sketch of a stepped foundation. (3 marks)
- (b) Sketch and label a vertical cross section through a reinforced strip foundation. (4 marks)
- 4 (a) State the type of climate where each of the types of buildings in **Figure 1** is used. (2 marks)



(i)



(ii)

**Figure 1**

- (b) Sketch and label a cross section of a hogsback coping stone. (2 marks)

5 Sketch and label a flat arch. (4 marks)

6 (a) State **one** function of each of the following fixings: (2 marks)

- (i) architrave; .....
- (ii) skirting. ....

(b) State the recommended pipe size for supplying water to the following sanitary fittings: (2 marks)

- (i) wash hand basin; .....
- (ii) bath tub. ....

7 State **two** functional requirements of each of the following:

(a) doors; (2 marks)

(b) walls. (2 marks)

8 Differentiate between pointing and jointing as used in wall finishes. (2 marks)

9 (a) State the function of each of the following parts of a scaffold: (2 marks)

- (i) base plate;
- (ii) guard rail.

(b) State **two** activities that a contractor must carry out at the end of a construction project. (2 marks)

10 Figure 2 shows orthographic views of a block drawn in 1<sup>st</sup> angle projection.

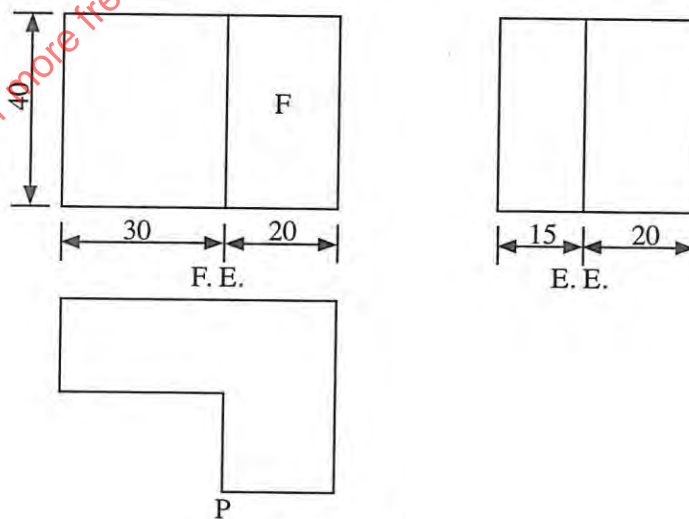


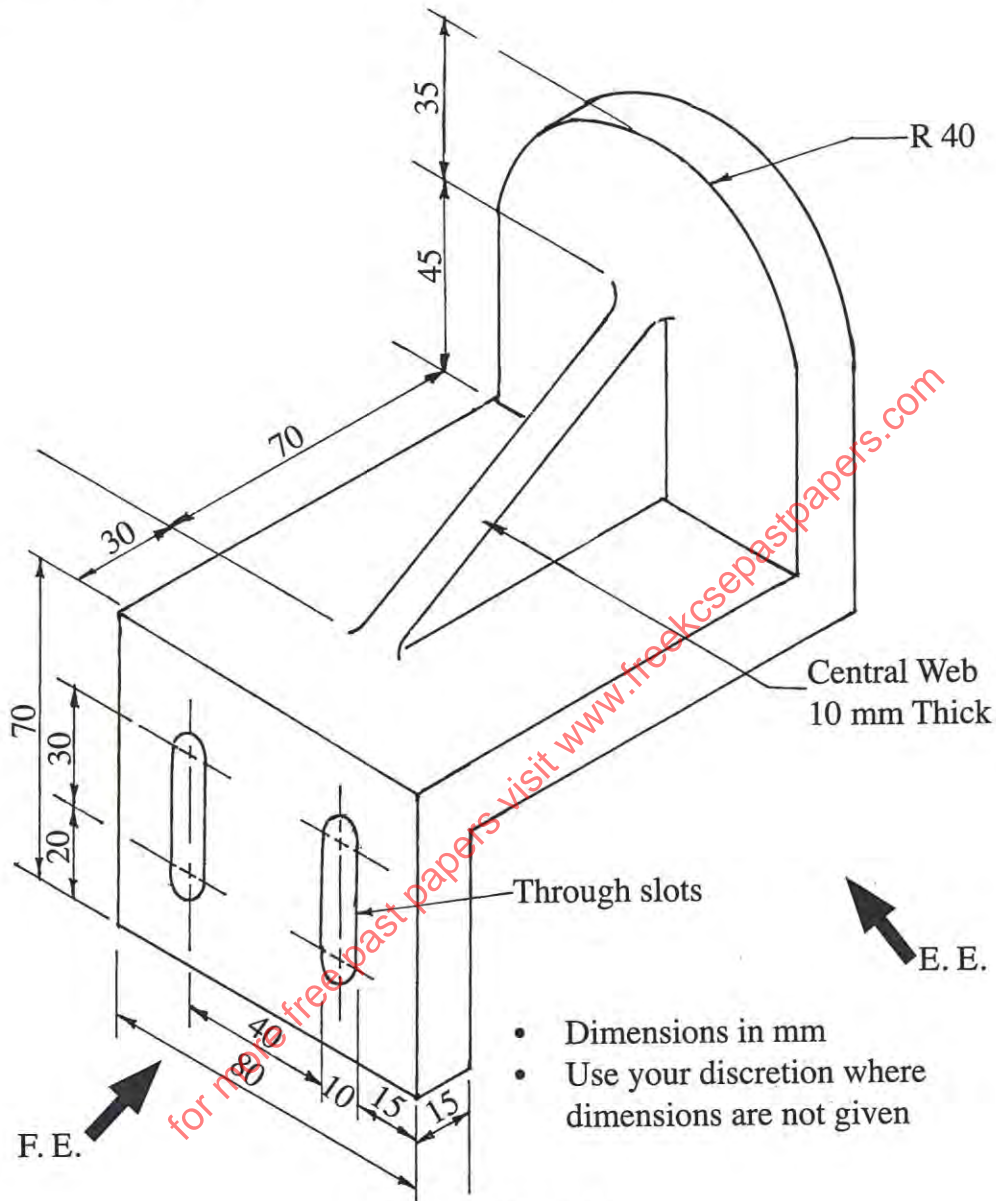
Figure 2

To a scale of 1:1, draw the block in oblique projection with F as the face nearest to the viewer. (3 marks)

**SECTION B (60 marks)**

Answer **question 11** on the A3 paper provided and any other **THREE** questions from this section in the spaces provided. Candidates are advised **NOT** to spend more than **25 minutes** on question 11.

**11** Figure 3 shows a pictorial view of a machine bracket.



**Figure 3**

To a scale of 1:1, draw the following orthographic views in third angle projection:

- Front elevation in the direction of arrow F. E;
- End elevation in the direction of arrow E. E;
- Plan.

(15 marks)

- 12 (a) Outline the procedure of laying a cement/sand floor screed on an old floor slab. (6 marks)
- (b) Use a labelled sketch to show how hot water is supplied from a hot water cylinder to a bath tub. (4 marks)
- (c) With the aid of a labelled sketch, explain the use of a marginal draft in stone dressing. (5 marks)
- 13 (a) State **two** advantages of each of the following classes of paints: (4 marks)
- (i) oil-based paints;
- (ii) water-based paints.
- (b) Using pictorial sketches, distinguish between header bond and stretcher bond in brickwork. (6 marks)
- (c) Sketch and label a vertical cross section to show timbering in loose soils. (5 marks)
- 14 (a) State **four** reasons for choosing stones as a building material over other materials. (4 marks)
- (b) State **three** functions of the following finishes in buildings: (6 marks)
- (i) plaster;
- (ii) floor screed.
- (c) Sketch and label a roof detail at the ridge for a roof covered with galvanized corrugated iron (GCI) sheets. (5 marks)
- 15 (a) Sketch and label a vertical section through a manhole. (9 marks)
- (b) Sketch the following carpentry joints:
- (i) corner mortice and tenon joint; (3 marks)
- (ii) half lap dovetail tee joint. (3 marks)

### 3.19 POWER MECHANICS (447)

#### 3.19.1 Power Mechanics Paper 1 (447/1)

#### SECTION A (40 marks)

Answer **all** the questions in this section in the spaces provided.

- 1 (a) Define a “machine”. (1 mark)
- (b) State **two** reasons for having a first aid box in a vehicle. (2 marks)
- 2 (a) State **three** functional characteristics of a road wheel. (3 marks)
- (b) (i) Define a business plan. (1 mark)
- (ii) List **four** components of a business plan. (2 marks)
- 3 (a) A piston ring fitted in a cylinder has a gap clearance of 0.25 mm at room temperature. Explain what happens to the gap clearance when the ring is hotter than the cylinder. (2 marks)
- (b) Name the parts labelled A, B, C and D on the fastener in **figure 1**. (2 marks)

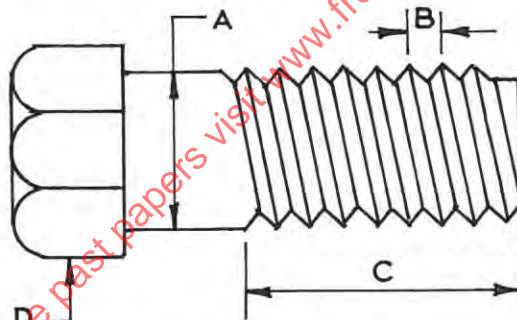


Fig.1

- A .....
- B .....
- C .....
- D .....

- 4 (a) State the purpose of each of the following tools:
- (i) reamer; (1 mark)
- (ii) tap. (1 mark)

- (b) State **two** factors to consider when selecting a spanner for a motor vehicle repair task. (2 marks)
- 5 (a) State **four** applications of a photovoltaic cell. (2 marks)
- (b) List **four** types of lighting circuits of a motor vehicle. (2 marks)
- 6 (a) State **two** functions of the final drive. (2 marks)
- (b) Sketch the symbols used to represent the following in assembly drawings: (2 marks)
- (i) a square;
- (ii) a countersunk.
- 7 Outline **three** properties of soldering flux. (3 marks)
- 8 (a) List **four** types of manual steering gearboxes. (2 marks)
- (b) Name **four** types of springs used in vehicle suspension systems. (2 marks)
- 9 State **four** purposes of lubricating oil additives. (4 marks)
- 10 Outline **eight** components of a pressurized water cooling system of a motor vehicle. (4 marks)

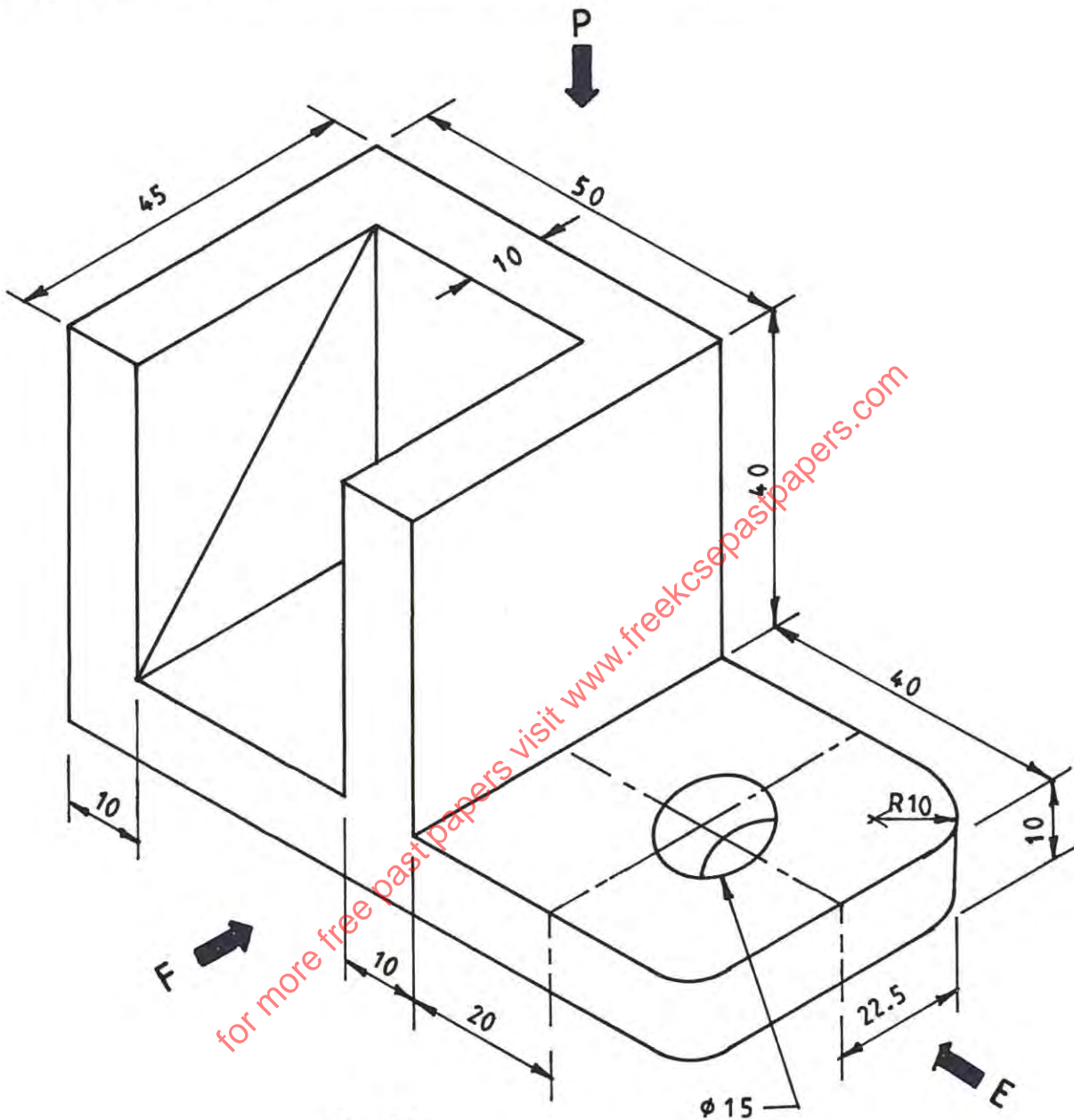
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**SECTION B** (60 marks)

Answer **question 11** on A<sub>3</sub> paper and any other **three** questions from this section in the spaces provided. Candidates are advised to spend **not more than 25 minutes** on question 11.

**11** **Figure 2** shows a machine block drawn in isometric projection.



**Fig. 2**

Draw **full size** in 3<sup>rd</sup> angle projection the following views:

- (a) front elevation in direction "F";
- (b) end elevation in direction "E";
- (c) plan.

(15 marks)

12 The **figure 3** shows a disc brake assembly:

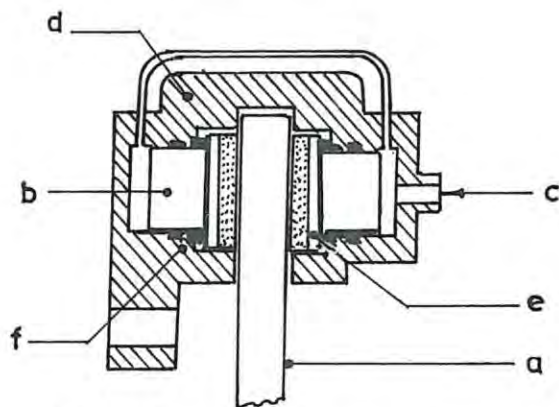


Fig. 3-disc brake assembly

- (a) Name the parts labelled a, b, c, d, e and f. (3 marks)
- (b) Explain the operation of the system when:
- (i) brakes are applied; (5 marks)
  - (ii) brakes are off. (7 marks)
- 13 (a) State **three** functions of the exhaust system. (3 marks)
- (b) (i) State the cause of back pressure in an exhaust system. (1 mark)
- (ii) Explain the consequence of excessive back pressure. (2 marks)
- (c) With the aid of a labelled cross-sectional sketch, describe the construction of an absorption silencer. (9 marks)
- 14 (a) State **three** operational differences between petrol and diesel engines. (3 marks)
- (b) Compare a petrol and a diesel engine of the same size with reference to: (12 marks)
- (i) weight;
  - (ii) running costs;
  - (iii) emissions;
  - (iv) thermal efficiency;
  - (v) compression ratio;
  - (vi) operating temperatures.
- 15 (a) State **four** functions of oil in an engine. (4 marks)
- (b) Describe the following lubrication methods used in different engines: (11 marks)
- (i) splash feed;
  - (ii) pressure feed.

### 3.19.2 Power Mechanics Paper 2 (447/2)

#### STATION 1

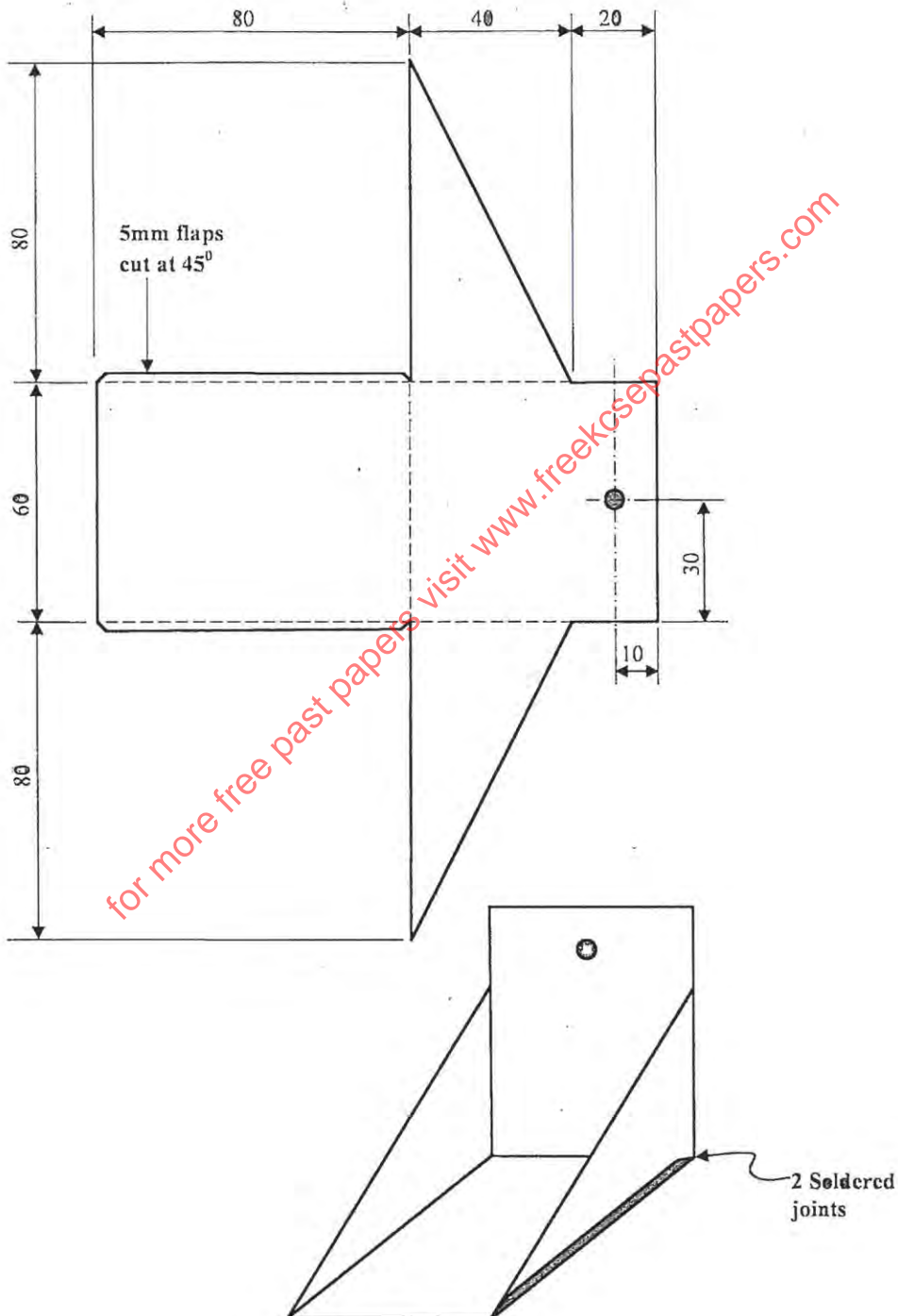
In the space provided, sketch in good proportion an exploded view of a differential assembly.

Label **four** parts.

(10 marks)

#### STATION 2

Use the materials, tools and equipment provided to make the sheet metal object shown in **figure 1**.



**Figure 1**

### STATION 3

Identify the parts and components labelled **P** to **T** and in each case, state the vehicle system it belongs to and its purpose. Complete the table below. (10 marks)

PART	NAME	VEHICLE SYSTEM	PURPOSE
P			
Q			
R			
S			
T			

### STATION 4

Using the instruments, materials and battery provided:

- (a) Measure and record in the table below the cell voltage and the specific gravity for each of the cells.

**LET THE EXAMINER CHECK YOUR WORK.**

CELL NUMBER	VOLTAGE	SPECIFIC GRAVITY	STATE OF CHARGE
1			
2			
3			
4			
5			
6			

- (b) Using the reading obtained in (a) above, comment on the state of the battery charge in each case. (10 marks)

### STATION 5

Identify the parts labelled **A, B, C, D, E** and name the vehicle system in which each is used. For each part, identify **ONE** defect and state its effect on vehicle performance. Complete the table below. (10 marks)

PART	NAME	VEHICLE SYSTEM	DEFECT	EFFECT
A				
B				
C				
D				
E				

### STATION 6

Using the components and materials provided, connect a **FOUR** lamp lighting circuit which satisfies the following conditions:

- (i) lamp 1 and 2 are in series;
  - (ii) lamp 3 and 4 are in parallel;
  - (iii) the lamps are controlled by switch S such that when lamps 1 and 2 are ON, lamps 3 and 4 are OFF.
- (10 marks)

**LET THE EXAMINER CHECK YOUR WORK.**

### STATION 7

On the vehicle provided:

- (a) Measure the free brake movement. (8 marks)
- (b) Comment on the state of the brakes. (2 marks)

**LET THE EXAMINER CHECK YOUR WORK.**

## STATION 8

On the engine provided:

- (a) Show the examiner **FOUR** visible components of the lubrication system. (4 marks)
- (b) (i) Check the oil level;
- (ii) Comment on the state of the oil level and the oil to the examiner. (6 marks)

**LET THE EXAMINER CHECK YOUR WORK.**

## STATION 9

On the single cylinder engine provided, determine the compression ratio. (10 marks)

**LET THE EXAMINER CHECK YOUR WORK.**

## STATION 10

On the multi-cylinder engine provided, carry out the following tasks:

- (a) Remove the contact breaker points;
- (b) Tell the examiner about the condition of the contact breaker points;
- (c) Replace the contact breaker points and set the gap to 0.4 mm. (10 marks)

**LET THE EXAMINER CHECK YOUR WORK.**

### 3.20 ELECTRICITY (448)

#### 3.20.1 Electricity Paper 1 (448/1)

#### SECTION A (48 marks)

Answer **all** the questions in this section in the spaces provided.

- 1 (a) State the name of the institution into which each of the following was upgraded:
- (i) Kenya Polytechnic;
  - (ii) Mombasa Polytechnic. (1 mark)
- (b) State the main duty of class A2 Electrical License holder. (1 mark)
- 2 (a) Name the materials used to make the parts of an AC machine in **table 1** and in each case state **one** reason why the material is used.

**Table 1**

PART	MATERIAL	REASON
Brushes	.....	.....
Slip rings	.....	.....

(3 marks)

- (b) State the **three** factors to consider when choosing a motor for a particular installation. (3 marks)
- 3 Draw a ring final circuit diagram with four socket outlets and a spur. (5 marks)
- 4 (a) State **two** factors that determine the resistance of a conductor. (2 marks)
- (b) Determine the colour code of a  $1500 \Omega \pm 5\%$  carbon resistor. (3 marks)
- 5 (a) (i) **Figure 1** shows a pair of current - carrying conductors. Draw the magnetic flux around the conductors. (2 marks)



**Figure 1**

- (ii) Name the type of force that exists between the conductors in a(i) above.

(b) With the aid of a labelled diagram show how each of the following permanent magnets are stored to preserve their magnetism: (2 marks)

- (i) horse shoe;
- (ii) bar.

6 (a) Name **four** faults that occur in electric circuits. (2 marks)

(b) State **two** ways of increasing the magnetic field strength of a moving coil instrument. (2 marks)

7 **Figure 2** shows a resistive circuit.

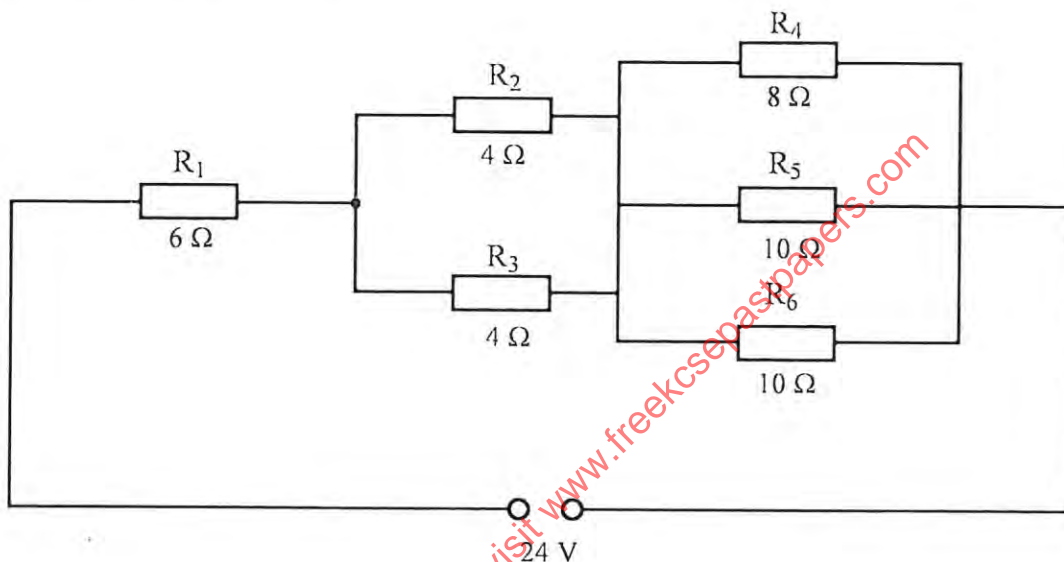


Fig. 2

Calculate:

(a) total resistance of the circuit; (3  $\frac{1}{2}$  marks)

(b) current through  $R_6$ . (2  $\frac{1}{2}$  marks)

8 (a) State **two** safety precautions to be observed when using each of the following:

- (i) arc welding machine;
- (ii) microwave oven. (4 marks)

(b) Name **four** non-ferrous metals used in manufacturing electrical components. (2 marks)



- 9 (a) State **four** qualities of successful entrepreneurs. (2 marks)
- (b) Sketch the correct symbol for each of the following electronic components: (3 marks)
- cored inductor;
  - LED;
  - electrolytic capacitor.

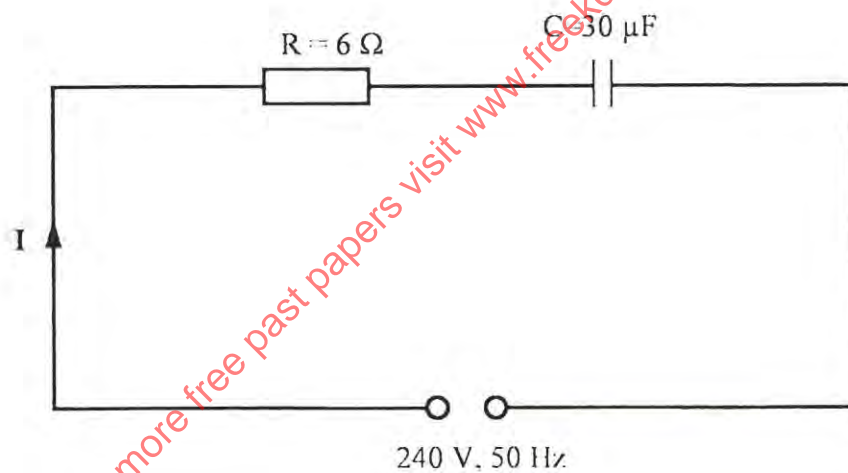
10 A  $47\text{ k}\Omega$  carbon resistor has a power rating of  $\frac{1}{4}\text{ W}$ . Determine the:

- (a) maximum current which can pass through it. (2  $\frac{1}{2}$  marks)
- (b) maximum voltage which can be applied across it. (2  $\frac{1}{2}$  marks)

**SECTION B** (52 marks)

Answer any **four** questions from this section in the spaces provided.

11 (a) **Figure 3** shows an R - C circuit.



**Fig. 3**

Calculate the:

- impedance; (2 marks)
  - current I; (2 marks)
  - phase angle. (2 marks)
- (b) Draw a labelled diagram of a continuous ringing bell. (7 marks)

12 Figure 4 shows a block drawn in isometric projection.

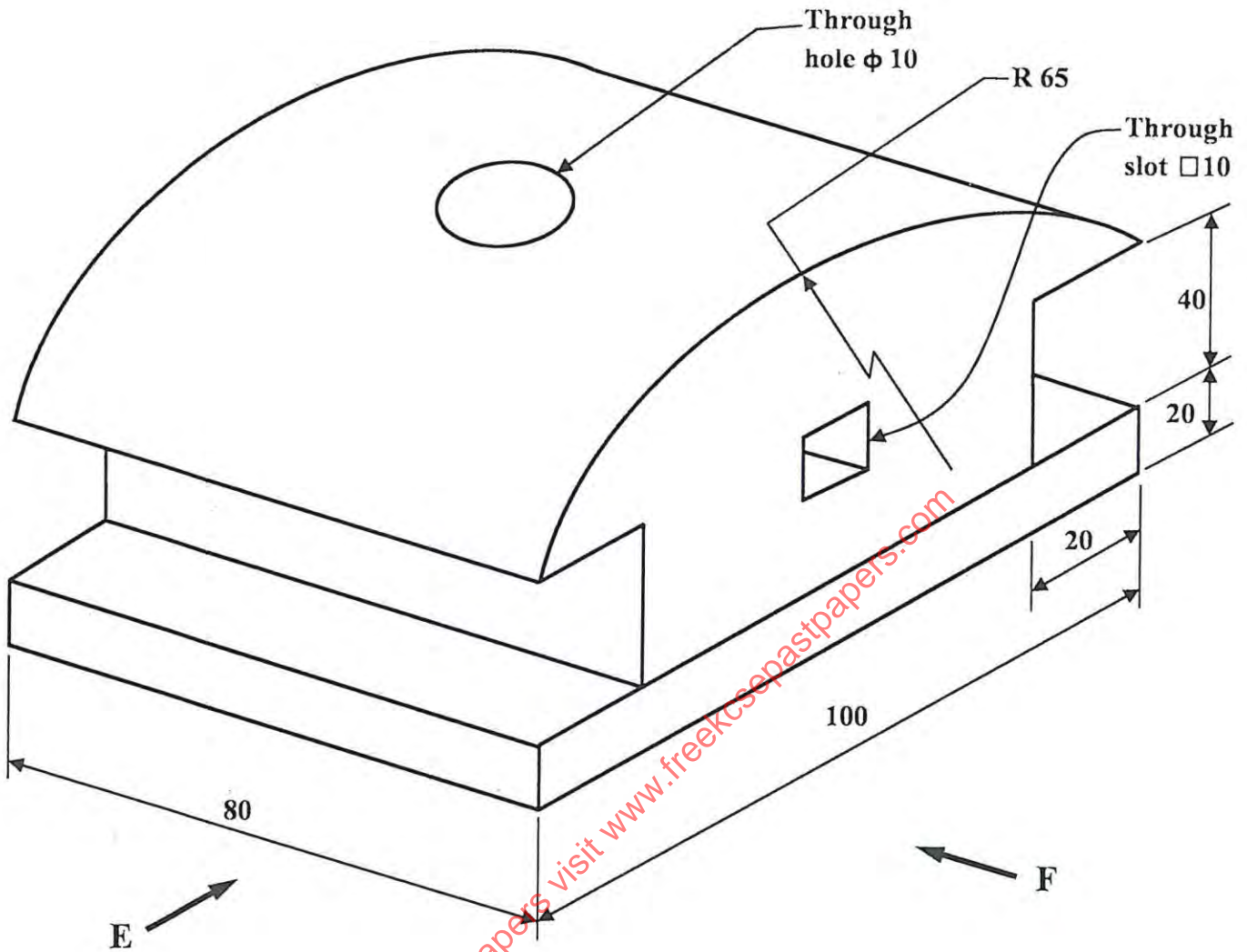


Fig. 4

Using first angle projection draw the following views full size:

- front elevation in the direction of arrow F;
- end elevation in the direction of arrow E;
- plan.

(13 marks)

(Use A<sub>3</sub> paper provided)

- 13
- State **three** reasons why autotransformers are more efficient than double wound transformers of the same rating. (3 marks)
  - Outline **three** functions of oil in a transformer. (3 marks)

- (c) **Figure 5** shows a step-up transformer supplying a load of 75 kW at unity power factor.

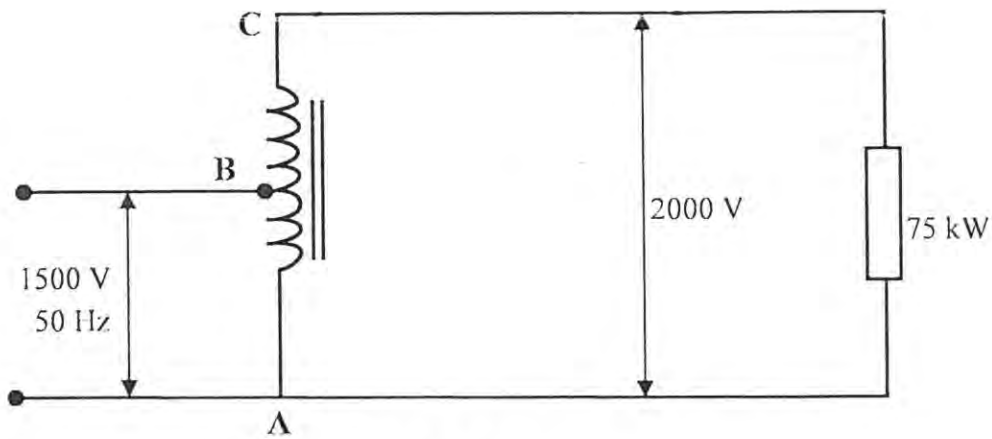


Fig.5

- (i) Neglecting the transformer losses, determine the:
- (I) load current; (2  $\frac{1}{2}$  marks)
  - (II) input current; (1  $\frac{1}{2}$  marks)
  - (III) current between points A and B. (2 marks)
- (ii) State what happens if there is an opening between points A and B. (1 mark)
- 14 (a) Outline **two** duties of an electrical contractor. (2 marks)
- (b) State **two** reasons for carrying out installation resistance test in an installation. (2 marks)
- (c) (i) Draw and label a filament lamp. (6 marks)
- (ii) A fluorescent lamp flickers in an effort to start. State **three** possible causes for this action. (3 marks)

15 (a) **Figure 6** shows a NAND gate in a circuit.

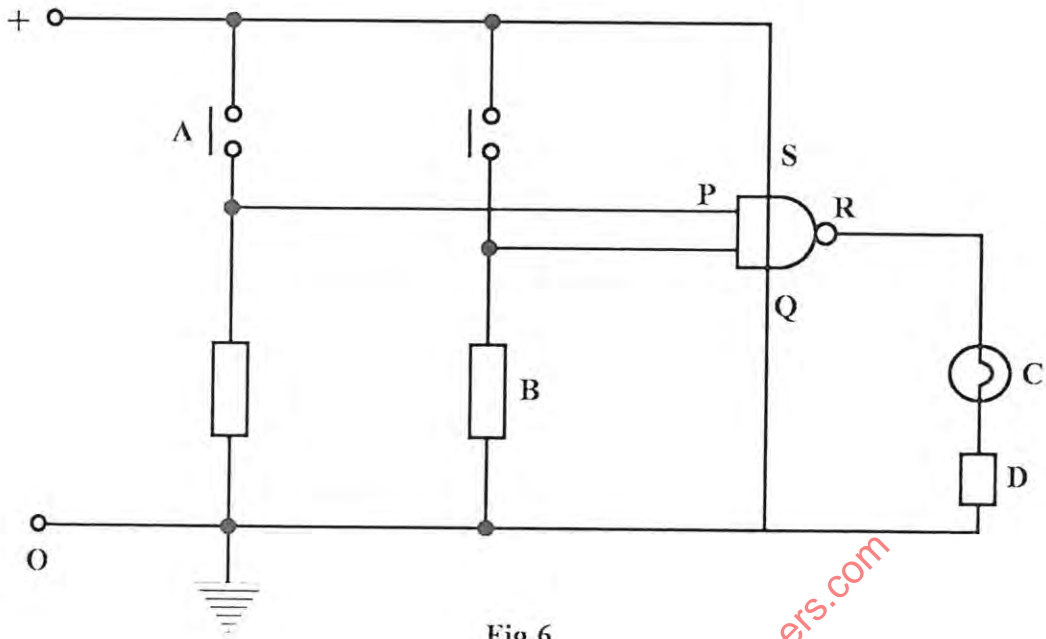


Fig.6

(i) Names the parts labelled P, Q, R and S. (4 marks)

(ii) State the functions of components A, B, C and D. (4 marks)

(b) **Figure 7** shows a capacitor discharge circuit.

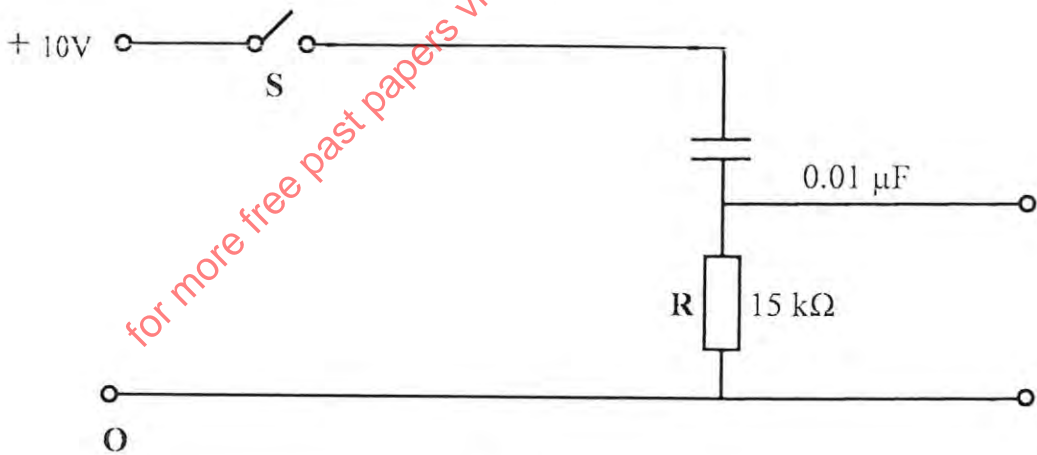


Fig.7

(i) Sketch the output voltage - time waveform when switch S is closed. (2 marks)

(ii) Determine the duration taken to fully discharge the capacitor. (3 marks)

3.20.2 Electricity Paper 2 (448/2)

1 STATION 1

Using the components, materials and equipment provided, carry out the following tasks:

- (a) Connect the circuit as shown in **figure 1**. Let the examiner check your work. (7 marks)

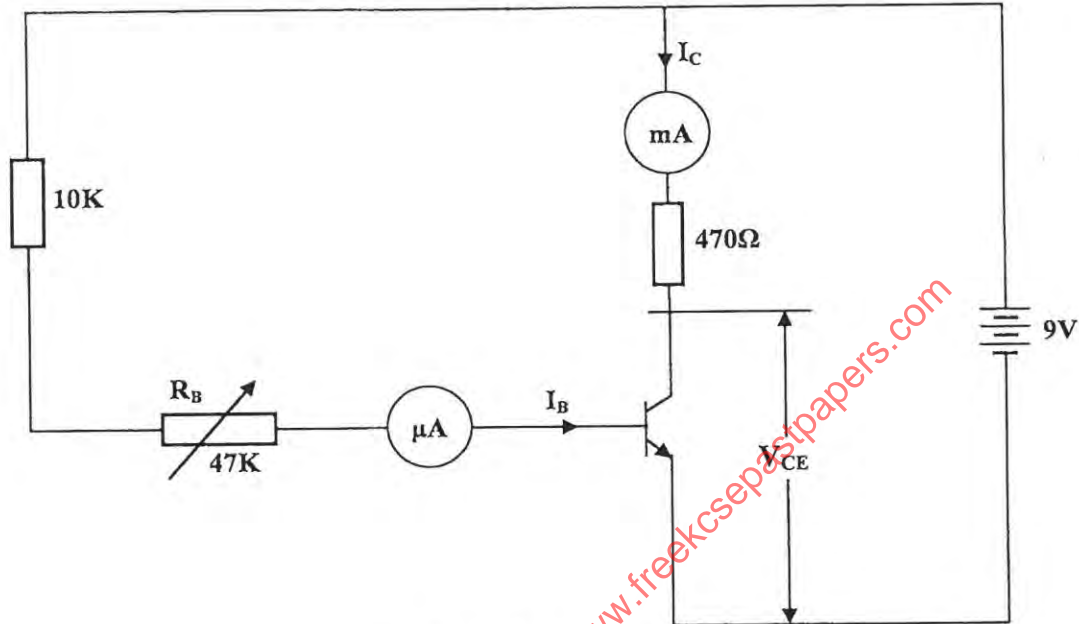


Figure 1

- (b) Vary the base resistance  $R_B$  to obtain each of the base current  $I_B$  values shown in **table 1**. For each value of  $I_B$ , measure and record in the table the corresponding values of  $V_{CE}$  and  $I_C$ . (6 marks)

Table 1

$I_B (\mu A)$	$V_{CE} (V)$	$I_C (mA)$
200		
220		
240		
260		
280		
300		

- (c) Using the values in table 1:
- (i) determine the current gain  $\beta$  when  $I_B = 240 \mu A$ . (2 marks)
  - (ii) plot a graph of  $I_C$  against  $V_{CE}$ . (5 marks)

2 STATION 2

Using the tools, equipment and materials provided, fabricate the saddle bracket shown in figure 2. (20 marks)

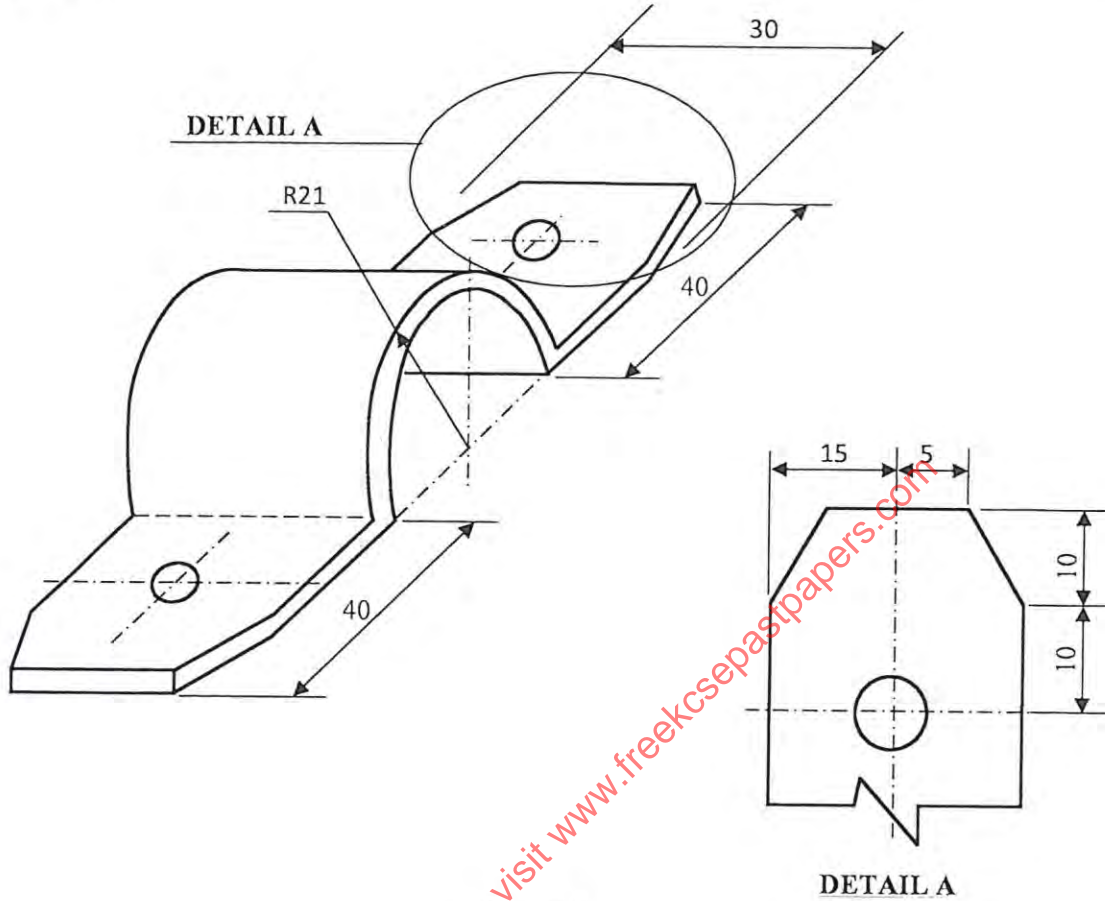


Figure 2

3 STATION 3

Using materials, components and equipment provided, perform the following tasks:

(a) Connect the circuit shown in figure 3. Let the examiner check your work.

(5 marks)

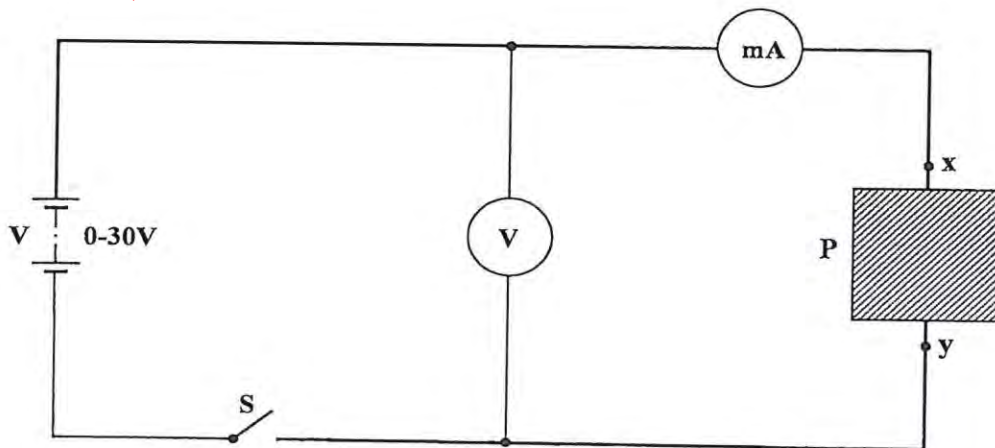


Figure 3

- (b) Close the switch S and adjust the power supply to obtain voltage values shown in **table 2**. For each voltage obtained, measure and record in the table the corresponding value of current.

**Table 2**

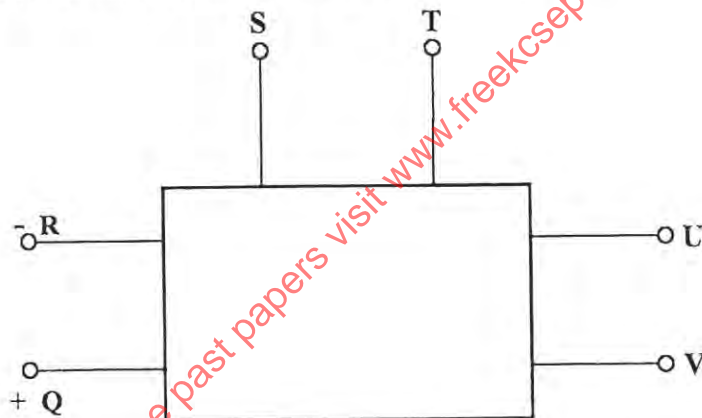
<b>Voltage, V (V)</b>	2.0	5.0	8.0	12.0	16.0	22.0
<b>Current, I (mA)</b>						

(6 marks)

- (c) Using the values in **table 2**, draw the graph of current I against voltage V. (5 marks)
- (d) Determine the slope of the graph. (3 marks)
- (e) Name the electrical quantity expressed by the slope of the graph and name its unit. (1 mark)

#### 4 STATION 4

Figure 4 shows the block diagram of the electronic circuit.



**Figure 4**

Use the equipment and accessories provided to perform the following tasks.

- (a) With the power supply off and output knob at minimum, connect the equipment to the terminals on circuit P as follows:-
- Q and R, a voltmeter;
  - S and T, a voltmeter;
  - U and V, a milliammeter;
  - Q and R, power supply.

**(Let the examiner check your work)**

(4 marks)

- (b) Turn the power supply ON. Adjust the power supply voltage to obtain the voltage values,  $E_s$  shown in **Table 3**.

In each case, measure and record in table 3 the corresponding values of Load Voltage  $V_L$  and load current  $I_L$ .

**Table 3**

ES	$V_{LOAD}$	$I_{LOAD}$
1		
3		
6		
7		
10		
12		

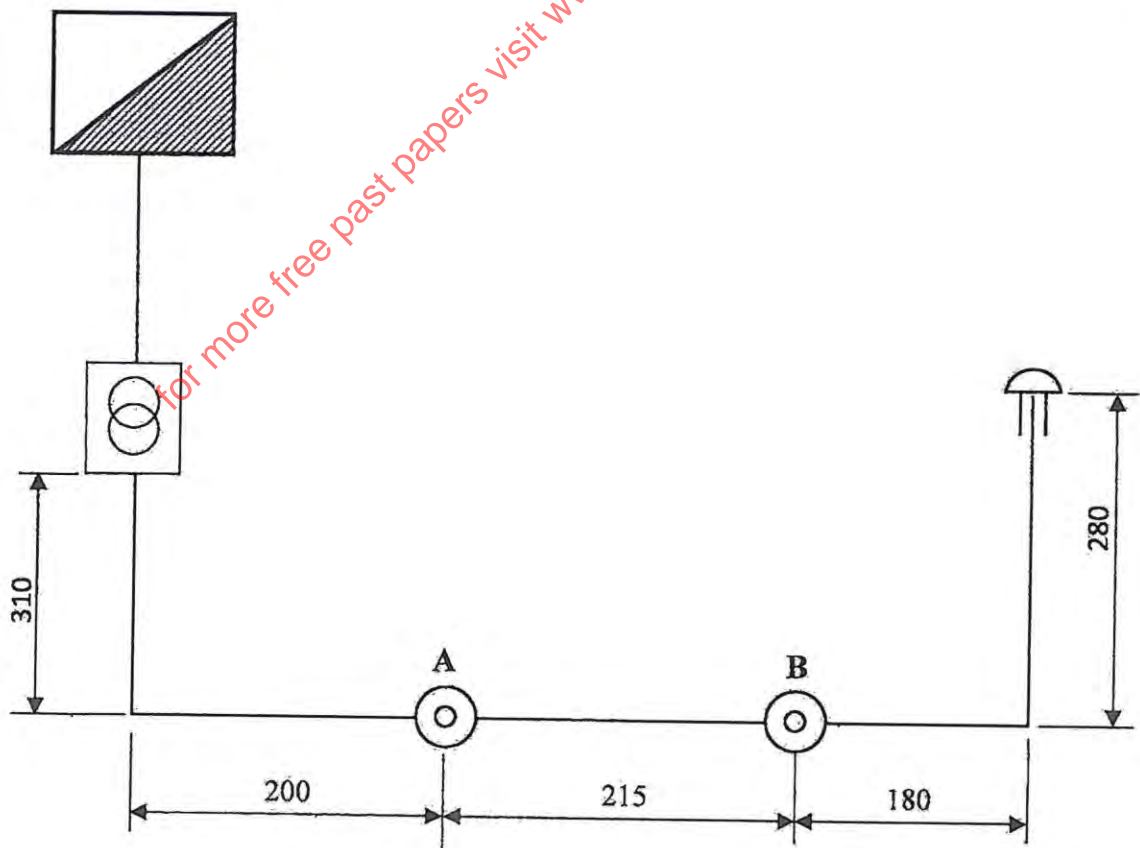
(9 marks)

(c) Plot a graph of load voltage  $V_L$  against power source voltage  $E_s$ . (5 marks)

(d) State **one** application of the circuit P and give the reason for your answer. (2 marks)

**5 STATION 5**

Using PVC sheathed wiring, complete the installation shown in **figure 5**, such that the bell is operated from either A or B. (20 marks)



**Figure 5**



### 3.21 DRAWING AND DESIGN (449)

#### 3.21.1 Drawing and Design Paper 1 (449/1)

#### SECTION A (50 marks)

Answer *all* the questions in this section on the answer sheet provided.

- 1 (a) Outline **three** qualities of an entrepreneur. (3 marks)
- (b) State **four** uses of computers in drawing. (2 marks)
- 2 (a) Name **two** methods of sharpening pencils and give **one** use of each. (2 marks)
- (b) Give **two** factors to consider when lettering. (2 marks)
- 3 (a) Sketch a cross section to show a multi ply board consisting of **five** veneers. (2  $\frac{1}{2}$  marks)
- (b) Distinguish between “design situation” and “design brief”. (3 marks)
- 4 (a) Name **four** components of a parts list on an engineering drawing. (2 marks)
- (b) Use sketches to illustrate **four** methods of dimensioning angles. (2 marks)
- 5 **Figure 1** shows an isometric drawing of a block.

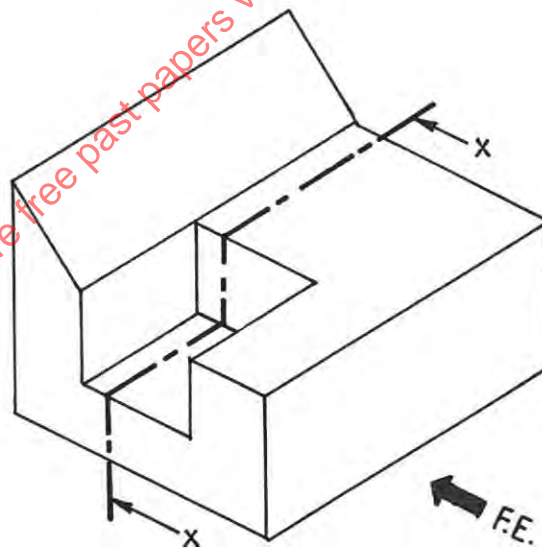


Fig.1

In good proportion draw the following:

- (a) sectional front elevation on the cutting plane X - X;
- (b) end elevation showing the cutting plane.

(6 marks)

- 6 **Figure 2** shows two views of a block drawn in first angle projection. In good proportion draw the block in oblique projection taking face A as the frontal face. (6 marks)

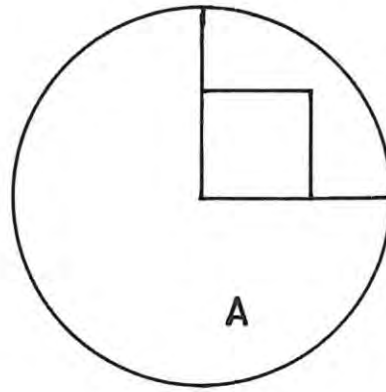


Fig. 2

- 7 Enlarge **figure 3** (ABCD) in the ratio of 5:7. (4 marks)

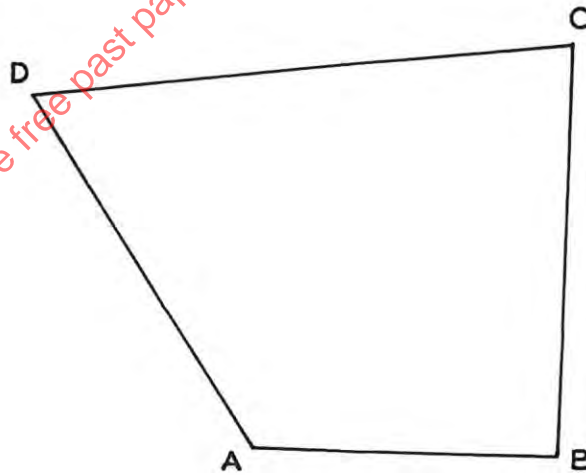


Fig. 3

- 8 Construct a diagonal scale in which 30 mm represent 1 km to read up to 4 km. Indicate a distance of 2.81 km on the scale. (6 marks)

- 9 **Figure 4** shows two views of a cone drawn in first angle projection. Draw the auxiliary view of the cone in the direction of arrow A. (6 marks)

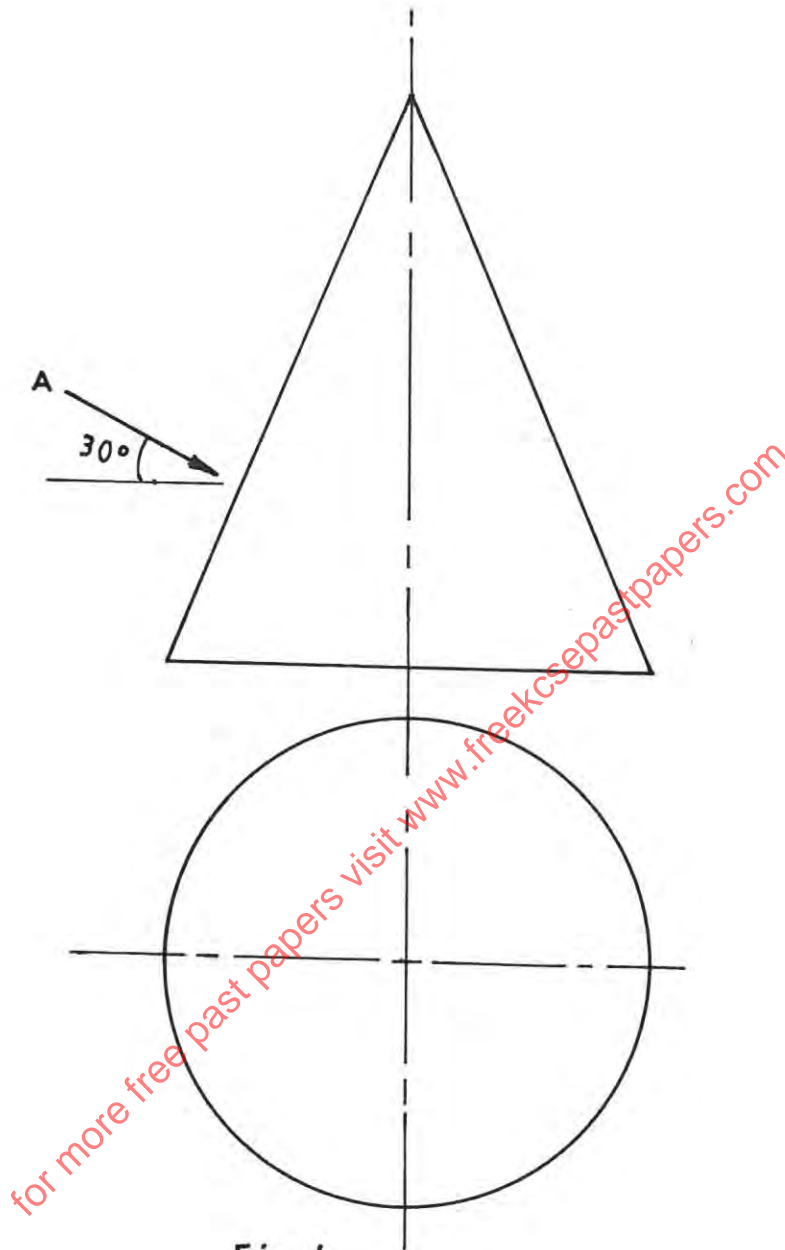


Fig. 4

- 10 Draw and label **five** parts of a circle. (3  $\frac{1}{2}$  marks)

**SECTION B** (20 marks)

*This question is compulsory.*

*It should be answered on the A3 paper provided.*

**11** **Figure 5** shows parts of a towing device drawn in first angle projection. Assemble the parts and draw FULL SIZE the following:

- (a) sectional front elevation along the cutting plane X - X;
- (b) end elevation (show hidden details).

(20 marks)

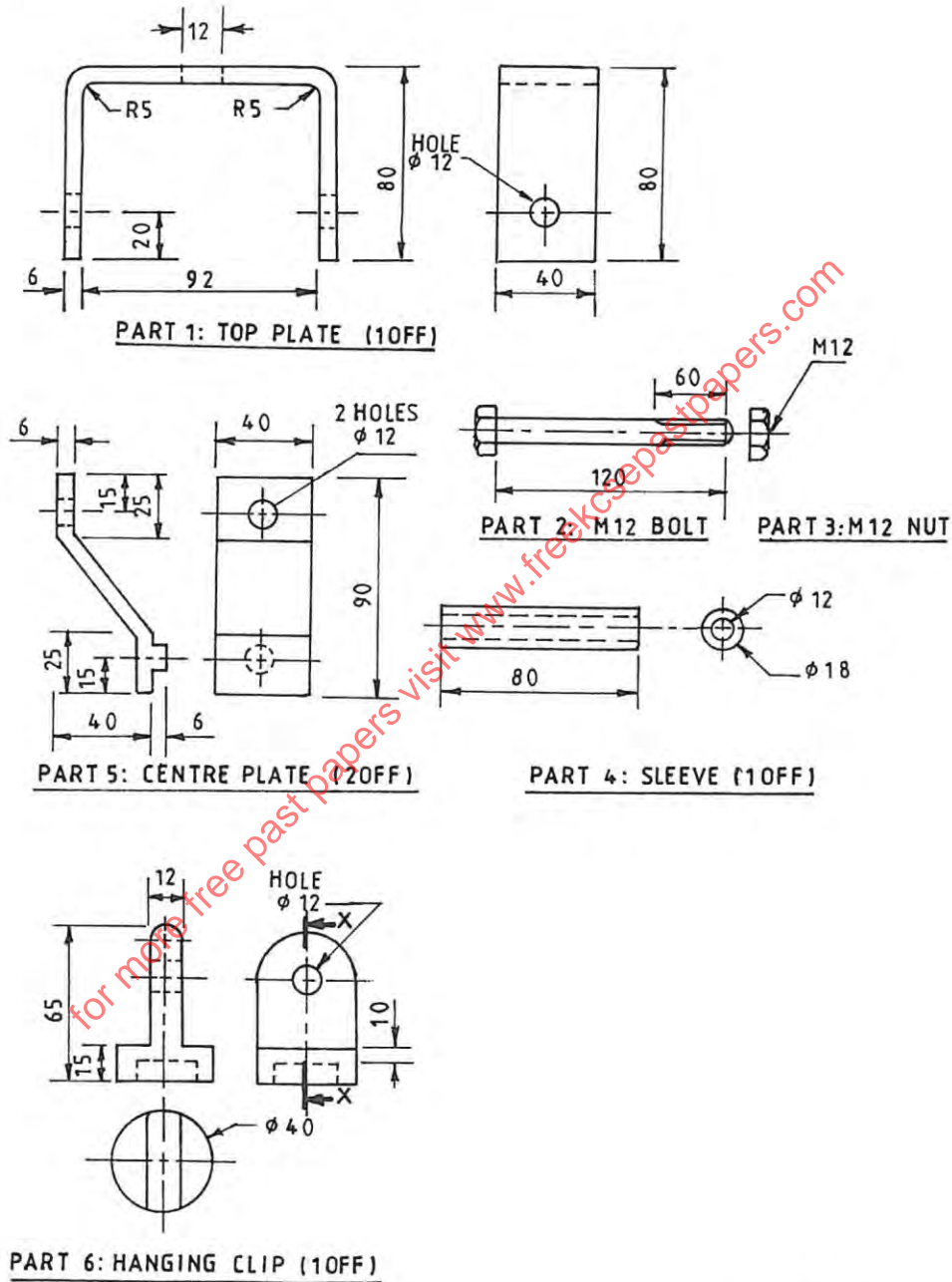
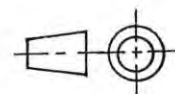


Fig. 5



- Dimension in mm
- Drawing not to scale

SECTION C (30 marks)

Answer any *two* questions from this section on the  $A_3$  paper provided.

- 12 **Figure 6** shows a crank mechanism in which point U reciprocates along XY as P rotates about O. VT is fixed at right angle to PU at T.

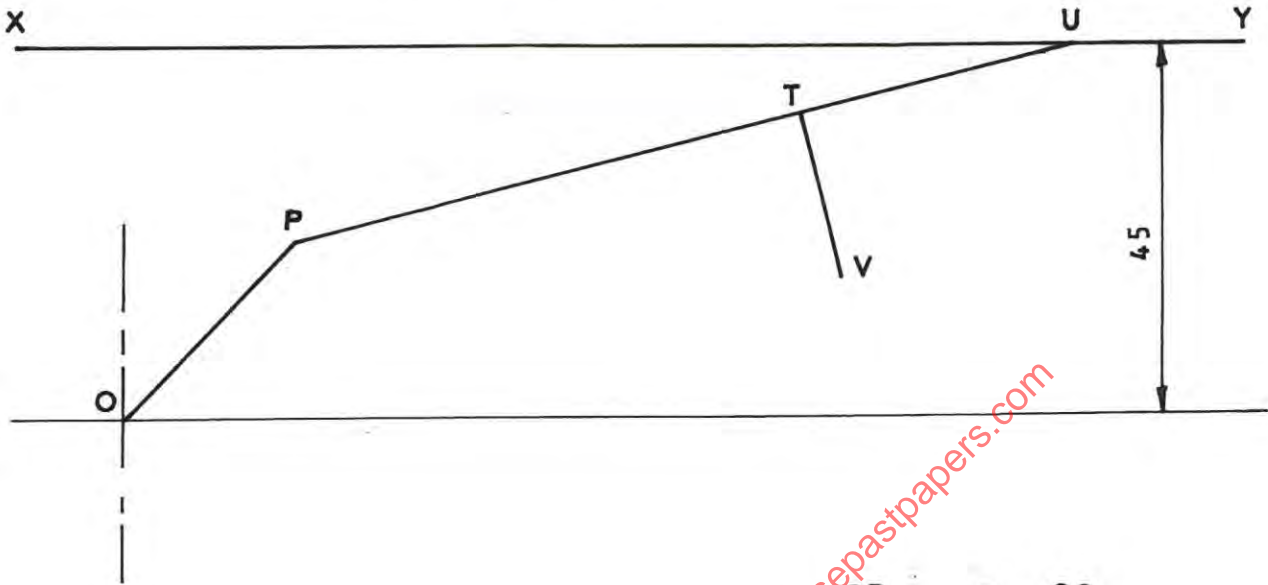


Fig. 6

OP	=	30
PU	=	100
TU	=	35
VT	=	20

Plot the locus of point V for a complete revolution of OP.

(15 marks)

13 Figure 7 shows a machine component drawn in isometric.

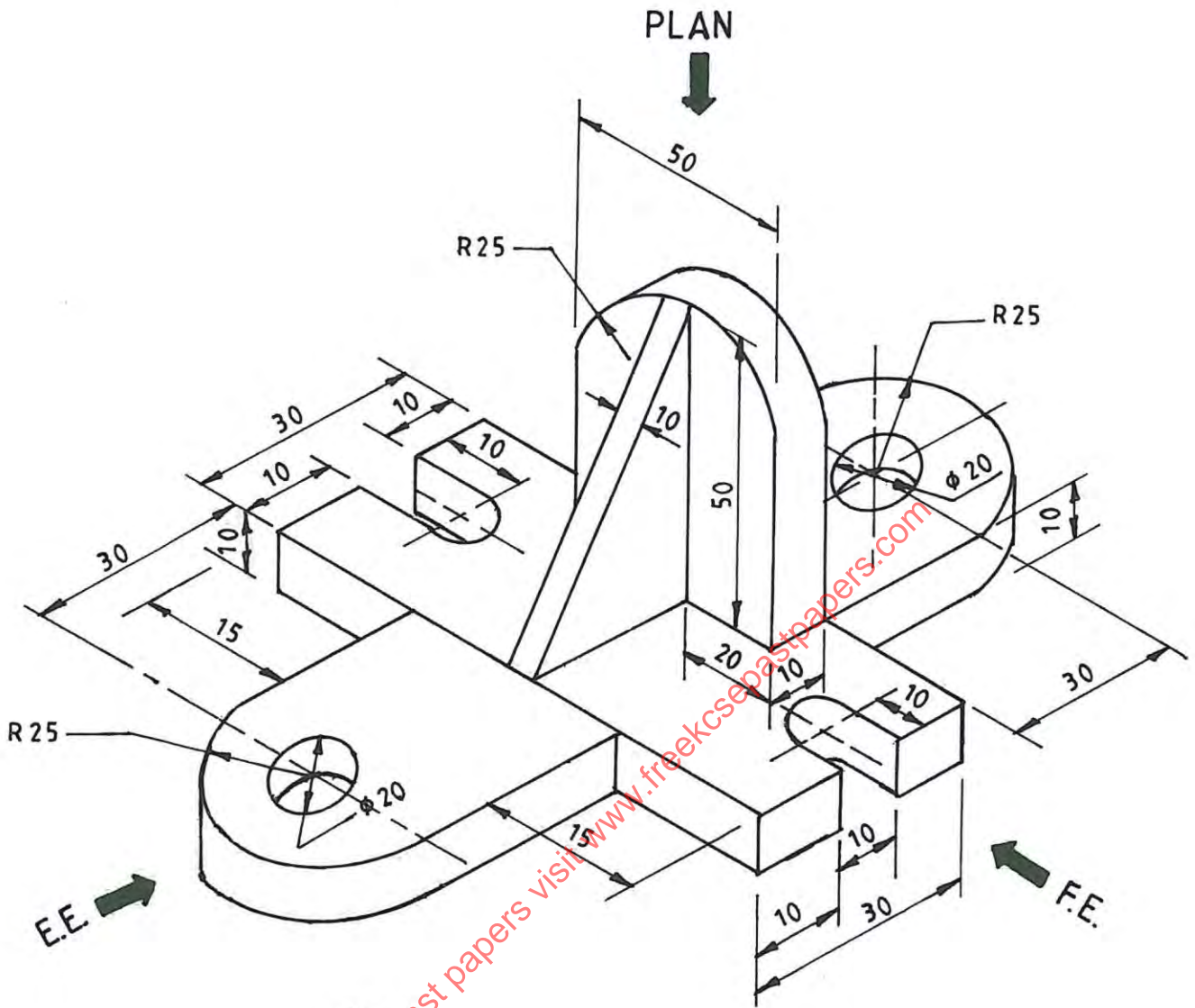


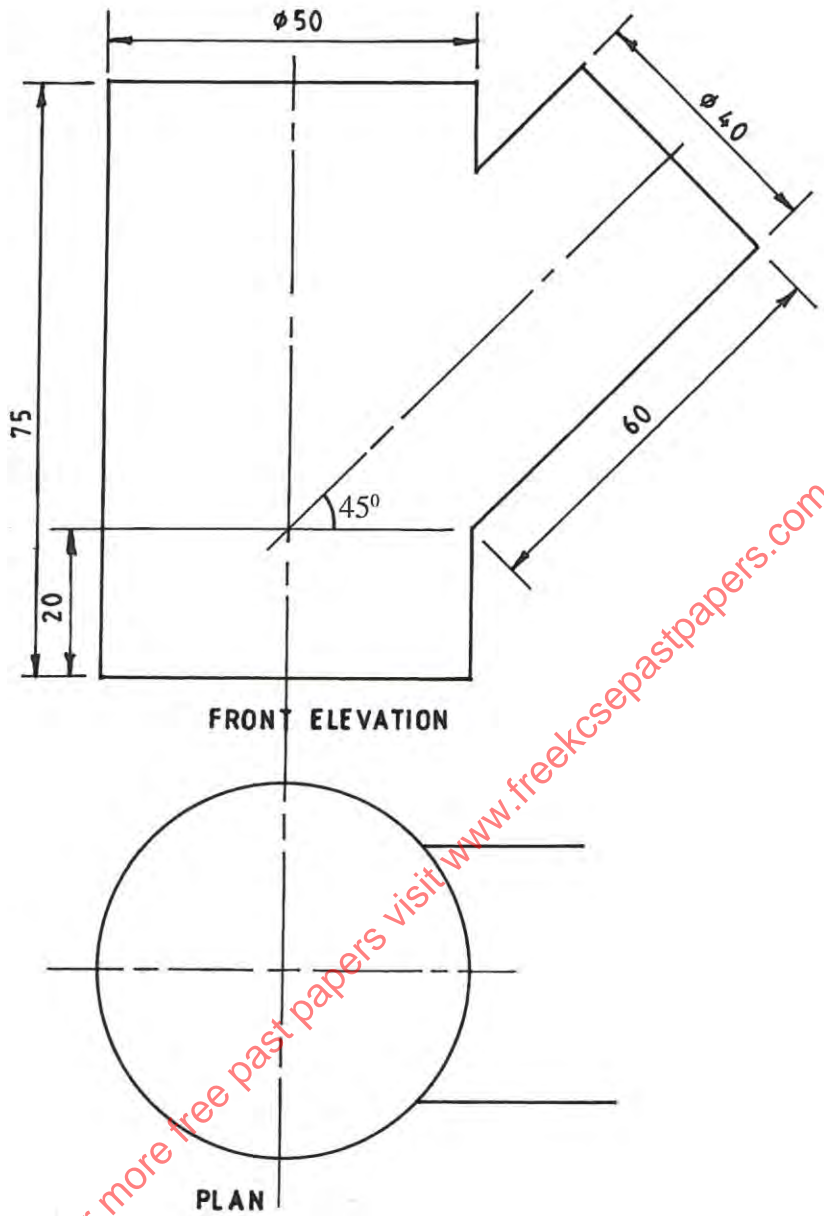
Fig 7

Draw FULL SCALE the following views in first angle projection:

- front elevation in the direction of arrow F.E;
- end elevation in the direction of arrow E.E;
- the plan.

(15 marks)

14 **Figure 8** shows the front elevation and an incomplete plan of two intersecting pipes.



**Fig. 8**

Draw the following:

- the curve of intersection on the front elevation.
- the complete plan.

(15 marks)

### 3.21.2 Drawing and Design Paper 2 (449/2)

#### DESIGN PROBLEM: (40 marks)

With the increase in use of desk top computers, schools have a challenge of effective utilization of space both as classrooms and computer laboratories. This has led to high maintenance costs, caused by frequent movements of the equipment.

Design a computer desk considering the following:

- (i) it should accommodate the monitor, central processing unit, keyboard and the mouse;
- (ii) it should be used for other learning activities;
- (iii) there should be minimal movement of the components in (i) above;
- (iv) the components should be safely stored when not in use.

#### REQUIREMENTS

- (a) Make freehand sketches of **TWO** possible designs. (8 marks)
- (b) Select **ONE** of the designs in (a) above and make a refined labelled pictorial sketch. (12 marks)
- (c) Draw detailed exploded views of the mechanisms in considerations (iii) and (iv) above. (12 marks)
- (d) List **FOUR** different materials used and state **ONE** reason for the choice of each. (6 marks)
- (e) Give **FOUR** possible methods of finishing the desk. (2 marks)



### 3.22 AVIATION TECHNOLOGY (450)

#### 3.22.1 Aviation Technology Paper 1 (450/1)

##### SECTION A (44 marks)

*Answer all questions in this section.*

- 1 (a) List **four** causes of electric shock as laid down in safety practices. (2 marks)
- (b) State **one** reason for bonding an aircraft during refuelling. (1 mark)
- 2 (a) Differentiate between the following terms as applied to materials:
- (i) Mechanical properties; (1 mark)
- (ii) Chemical properties. (1 mark)
- (b) Sketch each of the following aircraft hardware and state where each is applied:
- (i) Spring washer; (1 mark)
- (ii) Woodruff key; (1 mark)
- (iii) Countersunk rivet. (1 mark)
- 3 (a) Outline **two** environmental issues associated with the aviation industry. (2 marks)
- (b) Name **two** types of clouds with vertical development. (1 mark)
- 4 (a) List **three** challenges likely to affect the performance of a well managed international airline. (3 marks)
- (b) State the functions of each of the following in a Non-Destructive testing process:
- (i) Penetrants; (1 mark)
- (ii) Developers. (1 mark)
- 5 State the methods used to join each of the following aircraft parts:
- (a) Honey-comb structures; (1 mark)
- (b) Engine fire wall. (1 mark)
- 6 Explain the principle of generating thrust in each of the following aircraft engines:
- (a) reciprocating engine; ( $2\frac{1}{2}$  marks)

(b) pure jet engine. (2½ marks)

7 Name **five** stresses acting on an aircraft in flight and state where each is applicable. (5 marks)

**Types of stress**

**Where applicable**

.....

8 (a) Outline **four** functions of an aircraft undercarriage. (4 marks)

(b) State **three** basic principles of air navigation. (3 marks)

9 Outline **five** methods of reducing skin-friction associated with the boundary layer in flight. (5 marks)

10 Sketch and show the abbreviation of the following as applied in engineering drawing:

(a) across flats; (1 mark)

(b) under cut; (1 mark)

(c) counterbore; (1 mark)

(d) centreline. (1 mark)

**SECTION B (56 marks)**

*Answer any **four** questions from this section.*

11 (a) List **four** causes of 75% of air accidents caused by human error in the aviation industry. (2 marks)

(b) Explain **three** business opportunities for chartered aircraft operators. (6 marks).

(c) Explain the role of each of the following in the Aviation Industry:

(i) marshaller; (1½ marks)

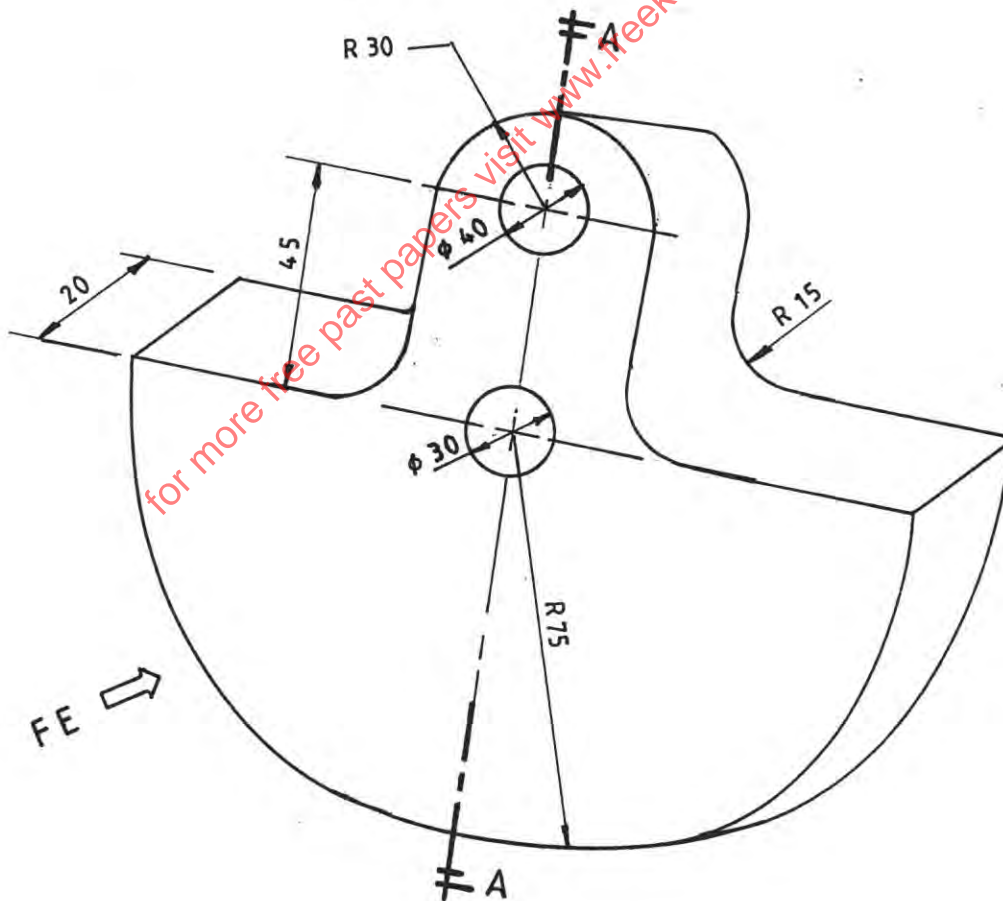
(ii) flight Engineer; (1½ marks)

(iii) air traffic controller; (1½ marks)

(iv) Purser. (1½ marks)

- 12 (a) Outline **four** methods used to vary the flow of fuel in an aircraft engine. (4 marks)
- (b) Explain the principle of operation of an aero piston engine float type carburettor. (4 marks)
- (c) Explain the principle of operation of each of the following aircraft gas turbine engine burners:
- (i) simplex burner; (3 marks)
- (ii) duplex burner. (3 marks)
- 13 (a) Explain the meaning of **four** colour markings on aircraft instruments. (4 marks)
- (b) Define the term graticule as applied in navigation. (1 mark)
- (c) Aircraft A is flown from point X,  $26^{\circ} 30' N$  to point Y,  $44^{\circ} 30' N$  while aircraft B is flown from point Q  $170^{\circ} E$  to point P,  $165^{\circ} W$ . Determine the change in latitude and longitude respectively for aircrafts A and B in degrees and minutes. (9 marks)

14 **Figure 1** shows an aircraft hinge bracket, drawn in isometric projection.



Draw FULL SIZE in first angle projection the following views:

- (a) front elevation in the direction of arrow F.E.
- (b) Section A-A.
- (c) Plan

(Use the A3 paper provided)

(14 marks)

15 (a) Describe each of the following aircraft structural members:

- (i) bulk head; (2 marks)
- (ii) longerons; (2 marks)
- (iii) spars. (2 marks)

(b) **Figure 2** shows a basic hydraulic system. Identify the components labelled 1 to 6.

(3 marks)

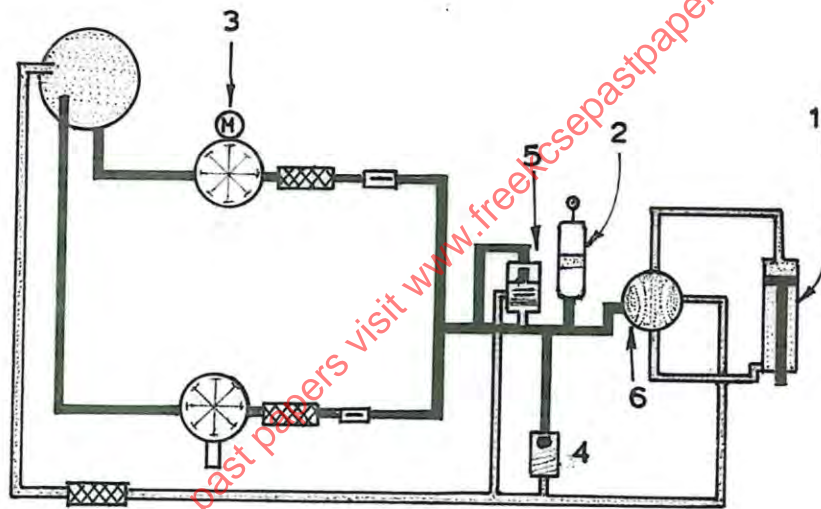


Figure 2

- 1. ....
- 2. ....
- 3. ....
- 4. ....
- 5. ....
- 6. ....

(c) Outline **five** reasons why a thread cutting tap may break while in use.

(5 marks)

### 3.22.2 Aviation Technology Paper 2 (450/2)

#### STATION 1

##### INSTRUCTIONS

Figure 1 shows a pictorial drawing of a hydraulic system component.

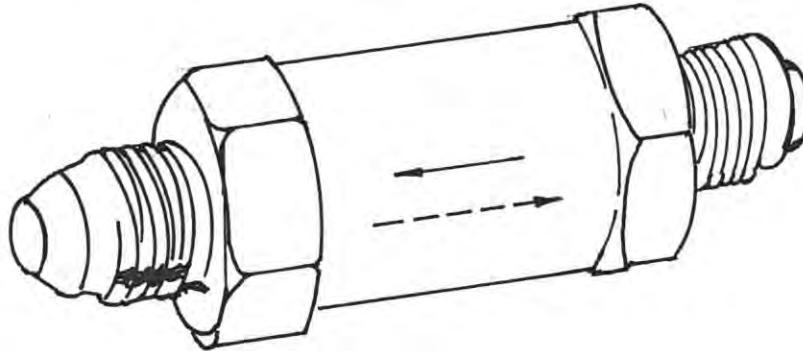


Figure 1

On the A3, drawing paper provided:

- (a) Sketch in good proportion of the cross section of the component.
- (b) Identify the component.
- (c) Label **six** main parts of the component. (10 marks)

#### STATION 2

##### INSTRUCTIONS

Using the template, tools, and materials provided, make the aircraft ram air scoop shown in figure 2. (10 marks)

#### STATION 3

##### INSTRUCTIONS

Using the tools and materials provided, carry out the following tasks:

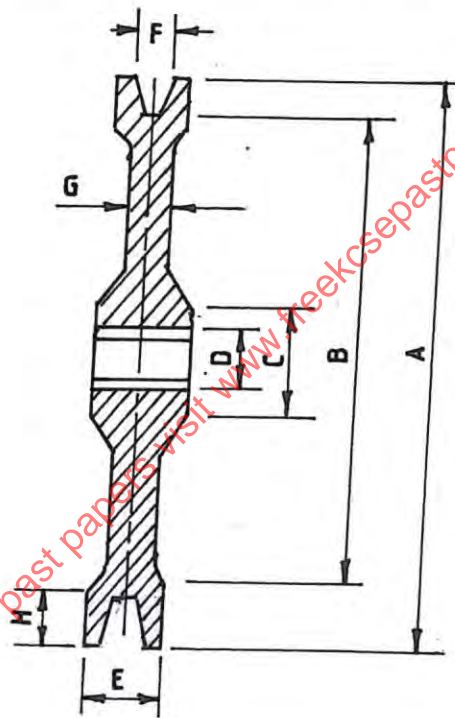
- (a) (i) Scribe each of the materials labeled A, B and C. Record your observations. (1  $\frac{1}{2}$  marks)
- (ii) Centre punch each material in a(i). Record your observations. (1  $\frac{1}{2}$  marks)
- (iii) File each of the materials in a(i). Record your observations. (1  $\frac{1}{2}$  marks)

- (iv) Bend each of the materials in a(i) to 90°. Record your observations. (1 ½ marks)
- (b) From the observations (i) - (iv), comment on the hardness of each material. (1 ½ marks)
- (c) Identify the materials labelled A and C. (1 mark)
- (d) State where each of the materials in a(i) can be used on an aircraft. (1 ½ marks)

### SECTION 4

#### INSTRUCTIONS

- (a) Figure 3 shows a sectional view of an aircraft pulley provided.



- Using the tools, measure and record the dimensions A- H as shown in the figure. (8 marks)
- (b) Identify the function of the part painted red on the pulley. (½ mark)
- (c) State **two** rejection criteria and **one** maintenance aspect of the pulley.
  - (i) Rejection criteria ..... (1 mark)
  - (ii) Maintenance aspect ..... (½ mark)

## STATION 5

### INSTRUCTIONS

Study the set up provided and perform the following tasks:

- (a) (i) Pour 300 ml of water at point A. Record the amount collected in beaker A1.  
Amount of water .....
- (ii) Repeat a(i) at B. Record the amount of water collected in beaker B1.  
Amount of water .....
- (iii) Repeat a(i) at C. Record the amount of water collected in beaker C1.  
Amount of water ..... (6 marks)
- (b) State the reasons for your observations in a(i), (ii) and (iii)  
Observation in (i), (ii) and (iii) ..... (1  $\frac{1}{2}$  marks)
- (c) Relate your observation in (b) to an aircraft in flight.  
Relationship in b(i), (ii) and (iii) ..... (1  $\frac{1}{2}$  marks)
- (d) State **two** overall effects of using body 'A' on an aircraft effects ..... (1 mark)

## STATION 6

### INSTRUCTIONS

Using the tools and materials provided, carry out the following tasks.

- (a) Identify the materials labelled 'X' and 'Y' ..... (1 mark)
- (b) Strip one end of material labelled 'X' and name the parts. .... (2 marks)
- (c) (i) Tin the stripped end of material labelled 'X'.  
(ii) Clip the male and female connectors on the material labelled 'Y'. .... (7 marks)

## STATION 7

### INSTRUCTIONS

Using the tools, wheel assembly and brake assembly provided, carry out the following

- (a) On the whole assembly
- (i) Check the tyre pressure.  
Pressure ..... (1 mark)
- (ii) Torque load the nut painted red to 60 450 lbs . Let the examiner check your work.  
(1 mark)
- (iii) Identify the tyre size and ply rating.  
Size .....  
Ply rating ..... (1 mark)
- (iv) Identify and record **two** rejection criteria.  
Criteria (i) ..... (1 mark)
- (v) State the purpose of the blue and white marks.  
Blue .....  
White ..... (1 mark)
- (b) Safely wire the bolts on the brake assembly. (5 marks)

## STATION 8

### INSTRUCTIONS

Using the tools and the engine components provided, carry out the following tasks:

- (a) (i) Identify the components labelled M and N.  
(ii) Measure and record the gap of the component labelled N.  
Gap ..... (2 marks)
- (b) (i) Remove the cap on the component M.  
Let the examiner check your work.



(ii) Identify the parts painted white and yellow.

White .....

Yellow .....

(iii) State the condition of distribution points.

(iv) Replace the cap.

Let the examiner check your work.

(4 marks)

(c) (i) Fit the leads on the component marked M to match the best firing order.  
Let the examiner check your work.

(ii) State **two** rejection criteria of the part labelled P.

(iii) State **two** functions of the part painted blue on component M.

(4 marks)

### STATION 9

#### INSTRUCTIONS

Study aircraft instruments marked 1 to 9 and carry out the following tasks.

(6 marks)

(a) Group the instruments into three major categories and complete the table below.

GROUP NAME	RELATED INSTRUMENTS
1.	(i) (ii) (iii)
2.	(i) (ii) (iii)
3.	(i) (ii) (iii)

(b) State the reasons for each grouping in (a).

GROUP      REASON

(1½ marks)

- (c) Name **three** settings made on instrument labelled 10. (1  $\frac{1}{2}$  marks)
- (d) Name **one** common error and maintenance task for instruments labelled 1 to 9. (1 mark)
- Error .....
- Maintenance task .....

### STATION 10

#### INSTRUCTIONS

- (a) Demonstrate to the examiner six marshalling signals from starting to taxing out on a twinned engine aircraft. (3 marks)
- (b) Identify and state the use of areas labelled A, B, C, D and E. (5 marks)

AREA NAME

USE

- (c) (i) State the name of runway and the direction of take off/landing.

Runway .....

Direction .....

- (ii) Give the functions of G and H. (2 marks)

G .....

H .....

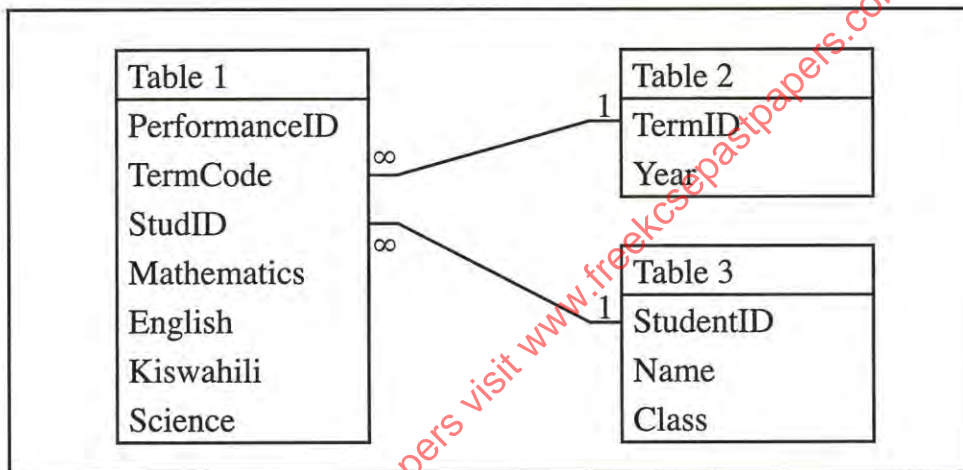
### 3.23 COMPUTER STUDIES (451)

#### 3.23.1 Computer Studies Paper 1 (451/1)

#### SECTION A (40 marks)

Answer **ALL** the questions in this section in the spaces provided.

- 1 State **two** circumstances under which warm booting of a computer may be necessary. (2 marks)
- 2 List **six** file manipulation activities that may be carried out using an operating system. (3 marks)
- 3 **Figure 1** shows relationships between tables in a database.



**Figure 1**

- Identify **two** primary and **two** foreign keys used in the relationship. (2 marks)
- 4 State **two** advantages of using portable computers. (2 marks)
  - 5 (a) Write the acronym MODEM in full. (1 mark)
  - (b) Explain the purpose of a modem when connecting to the internet. (2 marks)
  - 6 Distinguish between an *assembler* and an *interpreter* as used in programming. (2 marks)
  - 7 State **three** possible causes of fire outbreak in a computer laboratory. (3 marks)
  - 8 State **three** benefits of using optical magnetic reader to register candidates for an examination. (3 marks)
  - 9 List **four** factors to be considered when acquiring a printer. (4 marks)

- 10 State **three** circumstances under which voice input would be preferred over other methods of data capture. (3 marks)
- 11 A computer technician found it necessary to disable a firewall when working on a computer system. State **two** reasons that may have necessitated disabling of the firewall. (2 marks)
- 12 State **two** advantages of making payments through a mobile phone. (2 marks)
- 13 State **three** reasons why it is important to define datatypes of fields in a database correctly. (3 marks)
- 14 Explain **two** uses of a system documentation in system development. (4 marks)
- 15 Distinguish between a *systems administrator* and a *database administrator* as used in computers. (2 marks)

**SECTION B (60 marks)**

Answer **Question 16** and any other **THREE** questions in this section in the spaces provided.

- 16 (a) List **four** web programming languages. (2 marks)
- (b) State **four** ways in which a programmer can make program code easy to follow. (4 marks)
- (c) Draw a program flowchart to represent the following pseudocode. (9 marks)

```

Begin
  While scores exist
    initialize sum to zero
    initialize counter to zero
    input a score
    increment counter by 1
    Add score to sum
    If there are more scores to read,
      compute average as sum divided
      by counter
      Print the average
    Else
      input next score
    End if
  Else
    Print no records exist
  End while
End

```

- 17 (a) (i) In the BCD number coding scheme, letter A is represented by 110001 and letter B by 110010. Determine how the word CAB is coded in BCD. (2 marks)
- (ii) Convert the decimal number 11.125 to its binary number system equivalent. (3 marks)
- (iii) Perform the binary arithmetic:  
 $111.01 + 1011.111 - 101.011$   
and convert the answer to decimal notation. (3 marks)
- (b) Explain the importance of each of the following in word processing:
- (i) tab stops; (2 marks)
- (ii) section breaks. (2 marks)
- (c) State **three** documents that are used during mail merging in word processing. (3 marks)
- 18 (a) State **three** functions of networking operating systems other than providing network security. (3 marks)
- (b) Explain **three** ways in which an operating system provides data security in a computer system. (6 marks)
- (c) Explain **three** circumstances under which observation method may be preferred during data collection. (6 marks)
- 19 (a) (i) List **two** techniques of acquiring electronic images to be used in a desktop publishing program. (1 mark)
- (ii) Describe **two** layout guides in a desktop publishing program (DTP) that assist a user to place an object in a preferred position. (4 marks)
- (b) Explain **three** ways of ensuring that data submitted for processing is accurate. (6 marks)
- (c) An engineering company requires a computer system to design roads and bridges. Explain **one** suitable choice for:
- (i) output device; (2 marks)
- (ii) software. (2 marks)

- 20 (a) Explain **two** ways in which the use of internet could make reporting of corruption easier. (4 marks)
- (b) Explain **two** circumstances under which the use of wireless communication would be preferred in data communication. (4 marks)
- (c) **Figure 2** is an extract of a spreadsheet showing what the students had targeted to score and the actual score in a computer remedial class.

	A	B	C	D	E
1	NAME	TARGET SCORE	ACTUAL SCORE	PERFORMANCE FACTOR	REMARKS
2	Abdi	40	45		
3	Alex	30	65		
4	Ben	50	60		
5	Betty	30	20		
6	Bena	45	45		
7	Sheila	70	60		

**Figure 2**

A performance factor is obtained by subtracting the target score from the actual score and dividing the difference by the target score.

Write a formula that uses cell references only that would be entered in cell:

- (i) D2 to compute the performance factor. (2 marks)
- (ii) E2 to display the statement 'more remedials' if the performance factor is less than zero, 'exempted' if the factor is greater than zero and 'optional remedials' if otherwise. (4 marks)
- (iii) D8 to display the best performance factor. (1 mark)

### 3.23.2 Computer Studies Paper 2 (451/2)

- 1 (a) (i) Create a folder and name it as the last three digits of your index number. (1 mark)
- (ii) Open a word processing program and create the document below as it appears. (30 marks)

## BENEFITS OF SPORTS IN LEARNING INSTITUTIONS

### Why We Should Take Part in Sports

Physical exercises when integrated in curriculum help learners to acquire a balanced growth.

PHYSICAL  
EXERCISE  
IS GOOD  
FOR MIND,  
BODY AND  
SPIRIT

The following are some of the reasons why students should be encouraged to engage in sports while in learning institutions.

#### **Athletes perform better in academics**

Engaging in a sport requires a lot of time and energy. Sports require the skills of memorization, repetition and learning which are directly relevant to class work.

#### **Sports encourage team-work and help to achieve goals**

Aggressively going for a common goal with teammates and a team manager, teaches one how to shape a collective team synergy and effectively communicate the best way to solve problems en route to victory. This will be very helpful in later life when one encounters problems at the place of work or at home.

#### **Sports offer many health benefits**

Sports improve fitness and help in weight reduction. Sports also encourage healthy living. Athletes avoid smoking and alcohol drinking which offers health benefits in later life.

#### **Sports boost self-esteem**

Realising that hard work pays off brings about self-confidence. Winning a sport inspires an athlete to achieve any other goal set. This is very exciting and rewarding.

For all these reasons, it is always a great decision to get involved in sports.

### SPORTS SCHEDULE FOR THE YEAR

	SEASON 1	SEASON 2	SEASON 3	SEASON 4
Secondary Schools	Football		Indoor Games	Athletics
Primary Schools	Indoor Games	Football	Swimming	
Teacher Colleges	Swimming	Indoor Games	Football	
Technical Colleges		Football		
Universities	Rugby	Swimming	Motor Sports	

- (iii) Save the document as **Sportsfile** in the folder created in (i). (1 mark)
- (b) Insert the text “Department of Sports Resources” as a footer. Apply italics to the footer and align it to the centre. (2 marks)
- (c) Insert a section break at the end of the document created such that the new section starts on a new page. (1 mark)
- (d) (i) Insert a bar chart in the new section to represent the information shown in the following table. (5 marks)

	Season 1	Season 2	Season 3	Season 4
Primary Schools	20	18	4	20.4
Secondary Schools	10	8	20	15
Teacher Colleges	10	8	20	9
Technical Colleges	5	20	15	15
Universities	9	7	5	6

- (ii) Apply a grey background to the chart area created in (i). (1 mark)
- (iii) Insert a caption “The Annual Projected Cost of Organising Sports (Ksh.000,000)” to the chart. (2 marks)
- (iv) Change the orientation of the page containing the chart to landscape. (1 mark)
- (e) Apply line page border of thickness 3 pt to the page containing the chart. (2 marks)
- (f) Insert page numbers at the top right hand corner of the document. (2 marks)
- (g) Save the document and print it on both sides of the paper. (2 marks)

2 A non-governmental organisation is interested in maintaining a database of youth who are talented in different sporting activities in a certain village. You have been tasked to assist in developing the database.

- (a) (i) Create a database named **Talents** in the folder created in question 1a(i). ( $\frac{1}{2}$  mark)
- (ii) Create tables named: **PlayersTable**, **SportsTable**, and **TeamsTable** in the database created in (i) to store the information below using appropriate data type for each field. (20  $\frac{1}{2}$  marks)



Table 1: **PlayersTable**

PlayerId	SportId	FirstName	LastName	TeamId
PL004	BAS001	CHRIS	DAVIES	Z001
PL003	FTB003	ANDREW	MERRYS	Z002
PL005	VOL002	TIMOTHY	ANNE	Z001
PL002	BAS001	MARION	ANTHONY	Z003
PL010	FTB003	MELICER	ALI	Z003
PL013	VOL002	ANDREW	TAABU	Z002
PL009	BAS001	MERCY	TOLLY	Z001
PL011	FTB003	DAN	SHIDA	Z001
PL012	VOL002	BEATRICE	AMINA	Z002
PL015	VOL002	MATRINA	MAITHA	Z001

Table 2: **SportsTable**

SportsId	SportsName
BAS001	BASKETBALL
VOL002	VOLLEYBALL
FTB003	FOOTBALL

Table 3: **TeamsTable**

TeamsId	TeamName	RegistrationFeePerPlayer
Z001	EAGLE	300.00
Z002	SIMBA	400.00
Z003	KIFARU	200.00

- (iii) Assign an appropriate primary key to each table. (1 ½ marks)
- (b) Create the relationships among the tables. (2 marks)
- (c) Modify the PlayersTable so as to capture the Year of Birth for the players as shown below. (4 marks)

PlayerId	YearOfBirth
PL004	2001
PL003	2002
PL005	2000
PL002	2002
PL010	1999
PL013	1998
PL009	2002
PL011	2001
PL012	2000
PL015	2002

- (d) Create a form named **PlayersForm** used to enter data in the database to appear as shown in **figure 1**. (7 marks)

YOUTH SPORTS MEMBERS			
PlayersId	<input type="text"/>	TeamId	<input type="text"/>
FirstName	<input type="text"/>	TeamName	<input type="text"/>
FirstName	<input type="text"/>	YearOfBirth	<input type="text"/>

**Figure 1**

- (e) (i) Create a query named **EagleAgeQuery** to display the fields: PlayersId, FirstName, LastName and Age, for those players whose TeamName is EAGLE. The calculated field Age is obtained by subtracting the year of birth from the current year. (5 marks)
- (ii) Create a query to show all fields from the PlayersTable for players whose FirstName starts with letter "M" and TeamId is "Z003". Save the query as **MQuery**. (3 marks)
- (f) Create a report named **RegReport** to display the total registration fee collected from all the players in each team. (3  $\frac{1}{2}$  marks)
- (g) Print each of the following: (3 marks)
- (i) PlayersTable, SportsTable and TeamsTable;
  - (ii) EagleAgeQuery and MQuery;
  - (iii) RegReport.

3.24 FRENCH (501)

3.24.1 French Paper 1 (501/1)

SECTION 1

Listening comprehension (15 marks)

Write answers to Questions 1-6 in the spaces provided.

PASSAGE 1

1 Complétez ce tableau:

- (a) Événement: ..... ( $\frac{1}{2}$  mark)
- (b) Tarif: ..... ( $\frac{1}{2}$  mark)
- (c) Dates: du ..... au ..... mois  
..... ( $1\frac{1}{2}$  marks)
- (d) Nombre de pays représentés: ..... ( $\frac{1}{2}$  mark)

PASSAGE 2

- 2 (a) L'..... de la ..... invite  
les gens pour le ..... ( $1\frac{1}{2}$  marks)
- (b) Le ..... est disponible au site www. .... (1 mark)

PASSAGE 3

3 Complétez ce tableau.

	Magasin	Article à acheter
(a)	Epicerie	(i) $1\frac{1}{2}$ kg ..... 4 kg de tomates (ii). ..... de pommes
(b)	(i). .....	2 kg de viande blanche (ii) .....

(c)	(i) .....	1 gâteau au chocolat (ii) 4 .....  12 croissants
(d)	Pharmacie	.....

(3  $\frac{1}{2}$  marks)

(e) ..... a laissé le message pour .....  
(1 mark)

#### PASSAGE 4

- 4 (a) Monsieur Wade a déménagé au milieu rural il y a ..... ( $\frac{1}{2}$  mark)
- (b) Citez deux raisons pourquoi il n'est pas content :
- (i) ..... ( $\frac{1}{2}$  mark)
- (ii) ..... ( $\frac{1}{2}$  mark)

#### PASSAGE 5

- 5 (a) Complétez le Curriculum Vitae suivant.

Nom	Kaku
Prénom	(i) ..... ( $\frac{1}{2}$ mark)
Age	(ii) ..... ( $\frac{1}{2}$ mark)
Etat civil	(iii) ..... ( $\frac{1}{2}$ mark)
Nationalité	(iv) ..... ( $\frac{1}{2}$ mark)
Langues parlées	(v) Français, ..... ..... (1 mark)

- (b) On va contacter la candidate ..... ( $\frac{1}{2}$  mark)

## SECTION II

### 6 Dictation (5 marks)

Write the dictation passage in the spaces provided.

## SECTION III

### Composition (25 marks)

Write your **two** compositions in the spaces provided. Indicate clearly whether your choice is 1a or 1b, 2a or 2b.

1 In 120 - 150 words, write in French on:

#### Either

- (a) Ecrivez une lettre à votre mère/père où vous lui expliquez pourquoi il faut augmenter votre argent de poche. (10 marks)

#### Or :

- (b) Ecrivez une lettre à votre mère/père où vous expliquez pourquoi vous devez changer l'école. (10 marks)

2 In 150 -180 words, write in French a composition beginning :

#### Either:

- (a) Enfin, notre bus est arrivé et ... (15 marks)

#### Or:

- (b) Il était déjà 20 heures et ... (15 marks)

### 3.24.2 French Paper 2 (501/2)

#### SECTION 1 (15 marks)

Read the following passages and answer the questions that follow after each passage.

#### PASSAGE 1

1 Parmi les cadeaux de la nature, la musique est sans doute le plus enchanteur et équilibrant pour l'homme. La musique est importante pour notre bien-être. Ecoutez les oiseaux et les insectes: ils créent de la musique. Le vent dans les feuilles crée aussi un son plus ou moins violent surtout avant les orages. Toute musique a un effet sur nous. Voilà pourquoi il est essentiel de choisir ce que nous écoutons. Une bonne musique est adaptée non seulement à l'oreille humaine, mais aussi à sa conscience. L'harmonie est réalisée quand l'auditeur reçoit une joie en paix, grâce à ce qu'il écoute.

Un des rôles sociaux que joue la musique est de renforcer la cohésion du groupe. Lorsqu'on chante ensemble, cela montre l'unité. Quand on parle aux bébés ou aux jeunes enfants, on le fait de manière musicale. Cette action nous permet de communiquer à leur niveau. En plus, chaque génération a une musique qui la distingue et en même temps la rapproche. Au fait, le chemin entier de la vie humaine, de la naissance à la mort, est couvert de la musique.

Les grands compositeurs ont été inspirés par les expériences qu'ils ont vécues ou même des choses spirituelles très remarquables. Ce qui est décourageant est que certains d'entre eux se sentent obligés de consommer l'alcool et des drogues afin de parvenir à composer.

- (a) D'où vient de la musique dans la nature ?
- (i) .....( $\frac{1}{2}$  mark)
- (ii).....( $\frac{1}{2}$  mark)
- (b) Dites l'importance de la musique dans un groupe ( $\frac{1}{2}$  mark)
- (c) Pourquoi est-il nécessaire de choisir bien sa musique ? ( $\frac{1}{2}$  mark)
- (d) Pourquoi est-ce qu'on parle aux enfants musicalement ? ( $\frac{1}{2}$  mark)
- (e) Qu'est-ce qui inspire les gens qui composent la musique ? (1 mark)
- (f) Trouvez dans le texte, les synonymes de : (1  $\frac{1}{2}$  marks)
- (i) important .....
- (ii) forcés .....
- (iii) fonctions .....

## PASSAGE 2

2 La municipalité vient d'annoncer l'ouverture d'une nouvelle bibliothèque prévue pour jeudi le 16 mars. Ce centre d'information qui accueillera une centaine de personnes dans la salle de recherche est la première à avoir toutes ses fonctions automatisées. Ses ordinateurs reconnaissent la voix et la touche. Comme l'entrée à l'événement, un code spécial sera fourni strictement après une visite en personne par les intéressés. Il faut faire des réservations une semaine avant la grande occasion.

- (a) Citez l'aspect unique de la bibliothèque ? (1 mark)
- (b) Quelle est la date limite pour faire la réservation ? (1 mark)
- (c) Donnez le verbe correspondant à « ouverture ». ( $\frac{1}{2}$  mark)

## PASSAGE 3

L'utilisation du téléphone portable est de plus en plus répandue. Cet appareil permet non seulement le contact en permanence parmi les membres de la famille, des amis et d'autres groupes sociaux, mais aussi de suivre les actualités et prendre des photos. Néanmoins, son utilisation pourrait être particulièrement dangereuse quand on conduit.

3 Des observations montrent que de façon pratique, plus de la moitié de gens possédant un téléphone s'en servent au volant, soit pour recevoir un appel ou envoyer un texto. Cela explique le nombre croissant d'accidents de la route. En fait, un sur sept accidents quotidiens sont dus aux conducteurs distraits.

La situation est aggravée pendant le mauvais temps, quand la visibilité est mauvaise. Les cyclistes, les piétons au bord de la route, les enfants et les vieux sont les plus vulnérables et exposés aux actions des mauvais chauffeurs. Toutes les victimes ne meurent pas instantanément ; plusieurs perdent des années dans les centres de soins spéciaux. Certains perdent leur emploi à cause des durées très longues d'hospitalisation.

- (a) Deux activités possibles à travers le téléphone portable sont : (2 marks)
- (b) Selon le texte, pourquoi est-ce qu'il y a beaucoup d'accidents ? (1 mark)
- (c) Identifiez deux effets des accidents routiers aux victimes : (2 marks)

## PASSAGE 4

4 « Le café, la cigarette aussi mais là j'ai arrêté depuis cinq mois pour des raisons de la santé », dit Martin.

« Et puis, je cours et je fais de la boxe avec un coach qui n'a pas le droit de me taper ; je le paie bien et il ne peut pas me donner des coups. »

- (a) Qu'est-ce que Martin fumait auparavant ? ( $\frac{1}{2}$  mark)  
 (b) Quels sports pratique-t-il ? (1 mark)  
 (c) Pourquoi son entraîneur ne le punit pas ? (1 mark)

**SECTION II (15 marks)**

**5** *Beginning as indicated, rewrite the sentences below, making all appropriate changes.*

- (a) Ne faites pas de bruit dans le couloir du lycée.  
 Il est interdit .....(1 mark)
- (b) Je te demande de prendre ces articles.  
 Prends - ..... ( $\frac{1}{2}$  mark)
- (c) L'élève a mal à la poitrine.  
 La poitrine ..... (1  $\frac{1}{2}$  marks)
- (d) Les enfants nagent et ils crient.  
 En ..... (1 mark)
- (e) Cet homme recevra une bourse puis il ira au Tchad.  
 Avant ..... (1 mark)
- (f) Vous jouez avec la boue.  
 Pendant votre enfance .....(1 mark)
- (g) La maman veut dormir ; son fils aussi.  
 Le fils et ..... (1 mark)

**6** *Complete the following text by filling in each blank with **ONE** appropriate word.*

La famille Grosjean n'a vraiment pas eu (i) ..... chance le weekend passé.  
 Samedi matin, ils ont décidé d'aller faire (ii)..... pique-nique  
 (iii) ..... bord du lac. Alors, (iv) ..... six heures, (v)..  
 ..... la famille s'est réveillée. Deux heures (vi) ..... tard,  
 ils sont partis. Au grand carrefour, la voiture a commencé à faire du bruit ... et puis elle (vii) ..  
 .....tombée (viii) .....panne !



Pendant qu'ils attendaient le garagiste, ils voulaient (ix) ..... leur repas.

Hélas ! Ils l'avaient oublié (x)..... eux. (5 marks)

7 Complete the conversation below: (3 marks)

- : Allô, le bureau de gestion BCP.

(a) : .....

- : Je regrette, Madame Nina est absente ; elle est partie pour une conférence.

(b) : .....

- : Après demain.

(c) : .....

- : Absolument monsieur. C'est de la part de qui ?

(d) : .....

- : D'accord. Je laisserai un message dans sa boîte.

(e) : .....

- : Il n'y a pas de quoi. Au revoir, monsieur.

(f) :: .....

**Réponses :**

(i) Au revoir, madame.

(ii) Serait-il possible de lui laisser un message ?

(iii) Quand reviendra-t-elle ?

(iv) Merci beaucoup, monsieur.

(v) Allô. C'est Madame Toulou à l'appareil.

(vi) Abdel Diouf, du bureau régional. Dites-lui de venir prendre un message important.

(vii) Au revoir monsieur, et à ce soir.

(viii) Allô ! Puis-je parler à madame Nina, s'il vous plaît ?

3.25 GERMAN (502)

3.25.1 German Paper 1 (502/1)

SECTION I

Listening Comprehension (15 marks)

Passage 1

Listen to the conversation carefully and answer the following questions.

- 1 Wo findet die Situation statt? ..... (1 mark)
- 2 Wie lange braucht der Gast das Zimmer? .....(1 mark)
- 3 Was für ein Zimmer bekommt er?..... (1 mark)

Passage 2

Listen to the conversation carefully and answer the following questions.

- 4 Was wollen die Personen machen? .....(1 mark)
- 5 Wohin will Sara am Donnerstag gehen? .....(1 mark)
- 6 Sie gehen links in die ..... Straße. (1 mark)

Passage 3

Listen to the passage carefully and indicate for each statement whether it is true (R) or false (F) in the boxes provided.

- 7 Die Länder der Bundesrepublik haben den gleichen Landtag.
- 8 Hamburg, Bremen und Berlin sind Landeshauptstädte.
- 9 Bayern ist das größte Bundesland.
- 10 Belgien ist größer als Bayern.
- 11 Nordrhein-Westfalen hat die größte Einwohnerzahl.
- 12 In der Landeshauptstadt München liegt der ehemalige Regierungssitz.

R	F

(6 marks)

## Passage 4

Listen carefully to the passage and answer the following questions.

- 13 Bei wem wohnt Monika?..... (1 mark)
- 14 Wo liegt Florianópolis? ..... (1 mark)
- 15 Was will Monika werden? ..... (1 mark)

### SECTION II (20 marks)

Write a letter or an essay of about 220-250 words on **ONE** of the following topics in the pages provided.

- 1 Nach der Schule hast du vor, in Deutschland einen Job zu suchen. Schreib deinem deutschen Brieffreund(in) darüber und frag ihn/sie:
- Welche Arbeitschancen in Deutschland gibt.
  - Ob die Arbeitschancen gleich für Männer und Frauen sind.
  - Wie man sich am besten um einen Job bewerben kann.
  - Wie die Arbeitszeiten in Deutschland sind.
  - Was man außer jobben noch machen kann.
- 2 In einem Essaywettbewerb hast du eine zweiwöchige Reise nach Deutschland gewonnen. Du darfst deine Lieblingsstadt/ deinen Lieblingsbundesland in Deutschland besuchen. Schreib einen Brief an deinen Brieffreund/ deine Brieffreundin und erzähl:
- Welches deine Lieblingsstadt in Deutschland ist.
  - Welche öffentliche Verkehrsmittel es in der Stadt/ in dem Bundesland gibt.
  - Welche historische Bedeutung diese Stadt/ dieses Bundesland hat.
  - Welche Sehenswürdigkeiten möchtest du unbedingt besuchen/ sehen möchtest.
  - Was findest du besonders gut an dem Essen und der Kultur in deiner Lieblingsstadt/ deinem Lieblingsbundesland?
- 3 Dein Onkel hat deinem Cousin/deiner Cousine (6 Jahre alt) ein Smartphone zum Geburtstag geschenkt.
- Beschreibe vier andere Funktionen eines modernen Smartphones, außer telefonieren und texten.
  - Nenne drei Vorteile von Smartphones für das Lernen an der Schule.
  - Nenne zwei Nachteile des Smartphones für das Lernen an der Schule, und zwei Nachteile für die Familie.
  - Welche Formen von Unterhaltung kann man mit einem guten Smartphone genießen?
  - Ist ein 6-jähriges Kind zu jung, ein Smartphone zu haben? Warum/ Warum nicht?
- 4 In der Mittagspause kam meine Englischlehrerin zu mir. Sie sagte: „Du musst sofort zu dem Büro des Schulleiters gehen!“ Schreibe einen Aufsatz darüber.

### 3.25.2 German Paper 2 (502/2)

#### SECTION I: Grammar (20 marks)

A Complete the statements with the correct endings of “welch-“ and “dies-”

**EXAMPLE:** Welcher Tisch gefällt Ihnen am besten?

- Dieser da.

- 1 Welch..... Kopftuch wollen Sie denn nehmen?  
-Dies..... rote hier.
- 2 Bei welcher..... Leuten hast du eigentlich in Hamburg gewohnt?  
-Bei dies.....
- 3 Welch..... Fotoapparat findet ihr am modernsten?  
-Dies..... multifunktionalen.
- 4 Mit welcher..... Schülerin will der Lehrer denn sprechen?  
-Mit dies..... da am Fenster.

B Fill in the correct form of verbs in the subjunctive mode (Konjunktiv II).

**EXAMPLE:** Wir ..... gern jeden Tag Pizza..... (essen)

Wir würden gern jeden Tag Pizza essen.

- 5 Ich ..... gern einen Mercedes! (haben)
- 6 Wo..... du am liebsten im Urlaub? (sein)
- 7 Was ..... Sie anders..... wenn Sie Präsident wären? (tun)

C Join the sentences below with an infinitive sentence (Infinitivsatz) or using the conjunction “dass” where applicable.

**EXAMPLE:**

Daniella denkt nicht daran. Sie soll rechtzeitig ankommen.

**Daniella denkt nicht daran, rechtzeitig anzukommen.**

oder

**Daniella denkt nicht daran, dass sie rechtzeitig ankommen soll.**

- 8 Leider habe ich es nicht geschafft. Ich sollte alle meine Freunde zum Fest einladen.
- 9 Nekesa und Kendi finden es toll. Ihre Eltern haben ein neues Haus in Juja gebaut.
- 10 Nie hilfst du mir. Ich muss alleine die Wohnung putzen.

**D** Complete the sentences below using the correct question word.

**EXAMPLE:** **Worauf** müssen sich alle Schüler konzentrieren?

- 11 In..... hat sich das arme Mädchen aus Klasse 2A so verliebt?  
12 ..... hat sich der Deutschlehrer so schrecklich geärgert?  
13 ..... willst du diese wunderschöne Kette schenken?  
14 ..... haben Sie sich hier in Kenia nie angepasst?

**E** Fill the correct reflexive pronoun.

**EXAMPLE:** Wenn ich Hunger habe, kaufe ich **mir** eine Pizza.

- 15 Sind Sie neu hier? Haben Sie .....verlaufen?  
16 Du kannst..... die Haare waschen lassen, wenn du beim Frisör bist.  
17 Ihr macht hier zu viel Krach! Beruhigt .....!  
18 Wir haben ..... ein paar Lieder in der Mediothek angehört.

**F** Rewrite the sentences below in the indirect speech.

**EXAMPLE:** Tom sagt: "Ich finde die Schule manchmal toll"

**Tom sagt, dass er die Schule manchmal toll findet.**

- 19 Herr Mwinyi sagt :” Ich möchte am Freitag meine Familie treffen”.  
20 Jane fragt: “Wie viel kostet ein Paket Mehl?”  
21 Die Touristen fragen: „Können wir Elefanten in Kibera sehen?“  
22 Frau Müller sagt: „Schlagt die schwierigen Wörter im Wörterbuch nach!“  
23 Die Zuschauer fragen: „Wann fängt das Konzert an?“

**G** Join the following sentences with the suitable conjunction. ( 'Als' or 'wenn' )

**EXAMPLE:** Unser Onkel brachte uns immer Kekse. Er kam zu Besuch.

**Unser Onkel brachte uns immer Kekse, wenn er zu Besuch kam.**

- 24 Ich war in Buenos Aires. Ich besuchte das Maradona Museum.  
25 Njeri ruft ihren Vater an. Sie vermisst ihre Familie.  
26 Die Schwarzamerikaner hatten noch kein Wahlrecht. Martin Luther King Jr. hielt seine berühmte Rede.

**H** Rewrite the sentences below in the simple past tense. (Präteritum)

**EXAMPLE:** Meine Tochter kann mit zwei Jahren schon bis 100 zählen.

**Meine Tochter konnte mit zwei Jahren schon bis 100 zählen.**

- 27 Die Kinder lernen unter einem Mangobaum.
- 28 Darf man mit 16 Jahren wählen?
- 29 Ich schreibe im Winter lange Briefe.
- 30 Wie findest du den Alexander-Turm in Berlin?
- 31 Sie will jedes Wochenende ausschlafen.

**I** Fill in the correct possessive pronouns.

**EXAMPLE:** Das ist Frau Wassermann. **Ihre** Tochter ist Schülerin am Syke Gymnasium.

- 32 Gestern bin ich mit ..... Hund im Park spazieren gegangen.
- 33 Hast du schon wieder..... Lineal verloren?
- 34 Chebet und Korir wollen..... Eltern eine Kaffeemaschine schenken.
- 35 Wir brauchen das Handy..... Lehrers, um mit den Eltern zu telefonieren.

**J** Complete the sentences with suitable prepositions, definite articles or endings.

**EXAMPLE:** Die Lampe hängt an der Decke.

- 36 Warst du gestern .....Arzt ?
- 37 Am Montag fahre ich .....mein.....Tante nach Kisii.
- 38 Es war immer unser Traum,..... Mt. Kenia zu klettern.
- 39 .....eur ..... Hilfe hätte ich es nie geschafft!
- 40 Die Gläubigen saßen ruhig ..... Kirche, als der Priester reinkam.

## SECTION II: Reading Comprehension (20 marks)

A Read the following passage and answer the questions that follow.

### Das Studium in Deutschland

Simone Fischer will Organisationspsychologin werden. Die 24-Jährige recherchiert für ihre Diplomarbeit. Dabei nimmt sie 345 Studierende unter die Lupe. Sie fragt, wie die Studierenden ihr Studium organisieren und sie will wissen, welche Noten in ihren Abiturzeugnissen stehen. Mit den Daten will sie den Studienerfolg der Studierenden vorhersagen. Wie Menschen „ticken“, wie sie  
5 arbeiten und wie sie zusammenleben ist alles, was die Studentin fasziniert.

Simone wohnt in einer Wohngemeinschaft (WG). Für ihre Recherche beobachtet sie folgendes: Jeden Sonntag ist Daniel Kaufmann, Informatikstudent aus Bonn, als erster wach und hat schon die Brötchen vom Bäcker geholt. Adela Martin, Soziologiestudentin aus der französischen Kleinstadt Sevre, deckt bereits den Tisch und stellt die Kaffemaschine an, als Simone aus dem Bad kommt.  
10 Dafür wird Simone heute Abend den kleinen Grill auf dem gemeinsamen Balkon anfeuern. Die Wohngemeinschaft in Frankfurt am Main funktioniert bestens: Die zwei 24-jährigen Studentinnen und der 20-jährige Student sind Zimmernachbarn, Freunde und Helfer im Alltag: „Wir feiern, kochen und reden zusammen. Wir wohnen gerne hier zusammen.“ sagt Simone.

Dabei war es purer Zufall, der sie auf den 80 Quadratmetern im Frankfurter Stadtteil Bockenheim  
15 zusammengebracht hat. Die Wohnung gehört zu einem Studentenwohnheim. Das Studentenwerk entscheidet, wer die jeweils rund zwölf Quadratmeter großen Zimmer bekommt. Die Konkurrenz um die WG-Räume ist groß - wo sonst bekommt man in Frankfurt ein Zimmer plus Einbauküche und Balkon für 230 Euro? Viele deutsche Hochschul-Generationen haben seit Ende der 60er Jahre das Leben in der WG schätzen gelernt und freuten sich, „nicht alleine zu sein, wenn man in einer  
20 neuen Stadt abends nach Hause kommt“, wie es Simone formuliert. Alleine auf der Internet-Seite [www.wg-gesucht.de](http://www.wg-gesucht.de) werden jeden Monat 10 000 Suchanzeigen aufgegeben. Es ist sehr leicht in einer WG Freunde zu finden. Vor allem finden ausländische Studierende es gut, mit deutschen Studenten unter einem Dach zu leben. Immer mehr ausländische Studierende entscheiden sich wie Adela für ein Studium an einer deutschen Hochschule oder Universität. Rund 250 000 Studentinnen  
25 und Studenten aus aller Welt studieren zurzeit in Deutschland. Das sind etwa zwölf Prozent aller in Deutschland eingeschriebenen Studenten. Noch im Jahr 2007 entschieden sich 166 000 Studierende aus dem Ausland für einen Abschluss an einer der 365 deutschen Hochschulen. Die meisten der ausländischen Hochschul­ler kommen aus China und Osteuropa. Inzwischen ist Deutschland nach den USA und Großbritannien das dritt­wichtigste Gastland für Jungakademiker weltweit. Es gibt  
30 viele Fächer, die man in Deutschland besser studieren kann als in den meisten anderen Ländern der Welt. Neue internationale Studiengänge können in englischer Sprache studiert werden. Im Sommersemester 2007 gab es viele Studienangebote in der englischen Sprache.

Das macht deutsche Universitäten noch attraktiver.

Now answer the following questions based on the passage, in the spaces provided.

1 Was studiert Simone Fischer?

..... (1 mark)

2 Was bedeutet „ticken“ im Text?

..... (2 marks)

3 Nenne drei sonntägliche Aktivitäten für die drei Studenten.

.....  
.....  
..... (1½ marks)

4 Wie sieht außer dem Schlafzimmer die Einrichtung in einem WG-Raum aus?

.....  
..... (1 mark)

5 Warum ist das Leben in einer WG beliebt? Nenne drei Gründe.

.....  
.....  
..... (1½ marks)

6 Wo studieren ausländische Studenten am liebsten?

..... (1 mark)

7 Warum wollen viele Ausländer ein universitäres Studium in Deutschland machen?

.....  
..... (2 marks)



B *Read the following passage and answer the questions that follow.*

### **Der starke Hans**

Es waren einmal ein Mann und eine Frau, die hatten nur ein einziges Kind und lebten in einem abseits gelegenen Tale ganz allein. Es trug sich zu, dass die Mutter einmal ins Holz ging, Tannenreiser zu lesen, und den kleinen Hans, der erst zwei Jahre alt war, mitnahm. Da es gerade in der Frühlingzeit war und das Kind seine Freude an den bunten Blumen hatte, so ging sie immer weiter mit ihr in den Wald hinein. Plötzlich sprangen aus dem Gebüsch zwei  
5 Räuber hervor, packten die Mutter und das Kind und führten sie tief in den schwarzen Wald, wo jahraus jahrein kein Mensch hinkam.

Die arme Frau bat die Räuber inständig, sie mit ihrem Kind frei zu lassen, aber das Herz der Räuber war von Stein. Sie trieben sie mit Gewalt an, weiterzugehen. Nachdem sie etwa zwei  
10 Stunden durch Stauden und Dornen sich hatten durcharbeiten müssen, kamen sie zu einem Felsen, wo eine Tür war, an welche die Räuber klopfen und sich als bald öffnete. Sie mussten durch einen langen, dunklen Gang und kamen in eine große Höhle, die von Schwerter, Säbel und andere Mordgewehre, die in dem Lichten blinkten, und in der Mitte stand ein schwarzer Tisch, an dem vier andere Räuber saßen und spielten, und obenan saß der Hauptmann.

15 Die Frau blieb Jahre bei den Räubern und Hans wurde groß und stark. Als Hans neun Jahre alt war, machte er sich aus einem Tannenast einen starken Knüttel und versteckte ihn hinter das Bett; dann ging er zu seiner Mutter und sprach. "Liebe Mutter, sage mir jetzt einmal, wer mein Vater ist, ich will und muss es wissen." Sie sollte es ihm nicht sagen, damit er nicht das Heimweh bekäme.

20 Nachts kamen die Räuber heim, tranken Wein, einen Krug nach dem anderen, und fingen an, die Köpfe zu hängen. Da holte der Hans seinen Knüttel und haute auf den Hauptmann und die Räuber, dass sie Arme und Beine nicht mehr bewegen konnten.

Die Mutter stand in einer Ecke und wunderte sich über seine Tapferkeit und Stärke. Dann nahm sie den Hauptmann den Schlüssel zu der Eingangstür ab, und Hans holte eine großen  
25 Mehlsack, packte Gold, Silber und was er sonst noch für schöne Sachen fand, zusammen, bis er voll war, und nahm ihn dann auf den Rücken. Sie verließen die Höhle, aber was tat Hans die Augen auf, als er aus der Finsternis heraus in das Tageslicht kam und den grünen Wald, Blumen und Vögel und die Morgen-Sonne am Himmel erblickte. Er stand da und staunte alles  
30 an, als wenn er nicht recht gescheit wäre. Die Mutter suchte den Weg nach Hause und als sie ein paar Stunden gegangen waren, so kamen sie glücklich in ihr einsames Tal und zu ihrem Häuschen. Der Vater saß unter der Tür, er weinte vor Freude, als er seine Frau erkannte und hörte dass Hans sein Sohn war. Hans, obwohl er erst zwölf Jahre alt war, war doch einen Kopf größer als sein Vater.

*Now answer the following questions based on the passage, in the spaces provided.*

- 1      Wo und wie lebte die Familie? (1 mark)
- 2      Worüber freute sich Hans? (1 mark)
- 3      Wie sah die Höhle aus? (2 marks)
- 4      Gib die Anzahl der Räuber an. (1 mark)
- 5      Woher bekam Hans seine Waffe? (1 mark)
- 6      Beschreibe, wie Mutter und Sohn gerettet wurden. (2 marks)
- 7      Wie lange blieben die Frau und ihr Sohn in der Höhle? (1 mark)
- 8      Worüber freute sich der Vater? (1 mark)

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PART I

الأول القسم

LISTENING COMPREHENSION

المسموع فةم

الأول النصّ حول أسئلة

1- الشّرّق من كينيا حذود أدكر (1 mark)

2- السّاحل عن نيروبي مَسَافَة تَبْعُدُ كَمْ (1 mark)

3- وكينيا؟ في والقوميّة الرسميّة اللّغة هي ما

الثاني النصّ حول أسئلة

1- السنّة في كينيا تَسْتَقْبَلُ سَائِحًا كَمْ (1 mark)

2- كينيا إلى السّيّاح يجذب ما إذا (1 mark)

3- إلى الكينييين الكينيّة الحُكُومَة تَدْعُو لِمَ (1 mark)  
السّيّاحيّة أفق المَرَعَلَى الحفاظ

الثالث النصّ حول أسئلة

1- البنك إلى قاسم ذهب لِمَ إذا (1 mark)

2- الْحِسَابِ فَتَحَ مُتَطَلِّبَاتٍ مِنْ فَقَطٍ وَاحِدًا أُذْكَرُ .  
الْبَنِّكَ فِي (1 mark)

3- الْبَنِّكَ فِي قِاسِمٍ فَتَحَهُ الَّذِي الْحِسَابِ نَوْعٌ مَا ؟  
(1 mark)

الرَّابِعِ النَّصْرِ حَوْلَ أَسْئَلَةٍ

1- خَالَدٍ عَمَّ يَعْيشُ كَأَنَّ أَيْنَ ؟ (1 mark)

2- الْقَطَارِ مَحَطَّةٍ فِي خَالَدًا إِسْتَقْبَلَ الَّذِي مَنْ ؟  
(1 mark)

3- وَأَبِيهِ أُمَّهُ إِلَى رُجُوعِهِ بَعْدَ خَالَدٍ فَعَلَّ أَمَّا ؟  
(1 mark)

الْخَامِسِ النَّصْرِ حَوْلَ أَسْئَلَةٍ

عَلَيَّوْ سَأَلِمَ حَوَارِثَ بَيْنَ

1- مَرِيضًا كَأَنَّ مَنْ ؟ (1 mark)

2- يَشْكُو كَأَنَّ مِمَّ ؟ (1 mark)

3- سَأَلِمًا عَلَيَّ شَكَرَ لِمَ ؟ (1 mark)

## PART II

الثَّانِي الْقِسْمُ

DICTION

الإملاء

## الأول القسم القواعد

جمل إلى لآتية ا الاسمية الجمل حول -1س  
فعلية:

(1) القراءة يجي دون الطالب (1 mark)

(2) القاعة من يخرجن المعلمات (1 mark)

(ج) بالكسرتان إلى اتسافر انت الخريج (1 mark)

(د) البلد عن يدافعون الجنود (1 mark)

(4 marks)

يأتي م ال الم رادفة الكلمة هات -2س

(1) أطلب (1 mark)

(2) جاء (1 mark)

(ج) رتديا (1 mark)

(د) قيمة (1 mark)

(4 marks)

وغير الآتية الجمل في "لعل" لأدخ -3س  
تغيري ره يلزم ما

(أ) حياتنا في هامة وسيلة السيرة (1 mark)

(ب) عملهم في مجتهدان الولدان (1 mark)

(ج) بجد عمالون الموظفون (1 mark)

1  
الِاخْتِبارِ فِي نَاجِحَاتِ الطَّالِبَاتِ (د) (1 mark)

(4 marks)

أَمْ دَخَلَتْ سُمْرَةَ يَلَاتِ الْإِسْلَامَ لِيَسْأَلَهَا نَعْبُجًا 4-س  
:نَيْسُوقُ الْنَيْبِ أَمْ

تَرْزُؤَةٌ تَكْمَمُكَ (أ) (مكتبة 7) (1 mark)

تِأْرُقُ أَصْنَ مَكَ (ب) (نص 5) (1 mark)

□ (ج) (وفد 67) ؟ أَعْمَتُ جَلَّالاً رَضِحَ أَدْفَوْ مَكَ (1 mark)

□ (د) ؟ تَوْنُمِيْمَلِ أَخْ أَمْكَ (أخ 4) (1 mark)

(4 marks)

أَدْنَسُ مَلَأَتِيَّةً الْجَمَلَةَ أَبَتِكَ دِعْأً 5-س  
يَرِيغَتْ عَمَّ يَرْمِ الضُّلَّيْ لِيَأْضُرَّ مَالُ لَعْفِ الْ  
:مُزَلِّي أَمْ

(مُه) . يَأْضُرُّ مَالُ رَّةً الشَّيْفِ فَحَتَّمَالِ أَرْزِ (أ) (1 mark)

(مُتْنَأ) رَمَتُؤُمَالِ كَلِّإِءِجِ (ب) (1 mark)

(مُتْنَأ) ةَيِّمَلِأُأُ دِضَّةً لَمَحَ أَدَقِ (ج) (1 mark)

(نُه) يَأْئِهَّالِ نِأْنَحْتُمَلِأُ يِفْ تَأَزَفِ (د) (1 mark)

(4 marks)

## ة-الْمُطَالَع

الأسئلة عن أجب ثم الآتي النص اقرأ  
تليها التلي:

اثثأ ييرتشييل التجارة تجرم إلی ذاهباً أم كان  
سريخم هي قد صرب - هي قرط في - يقاتل في، لزنم ال  
رلأخا أمهم داحو لك لأسو اني قد ال ص احافصرتف  
نأ سريخم هي قد صر نم ماد بلط م م. يرسل ال الح نع  
كلع سريخم قافوف ارجالن رجتم كليا عم بهدي  
كليا مسقني يذال الم تجر نيل ام الز لخد كلد  
يلزنم ال اثثألل ضرعم قسم: هم، نينثا نيم سرق  
يلزنم ال ثثألل ارجالن أيهف عن صري شرور مسقو

م م هي ل ع ام لسو ل حم ال باح ص اني قد ال ص ل ابق  
يهف ادهش ثيح ييلزنم ال اثثألل ضرعم كليا أم دهخا  
ياسرك مقط ماد ارتخا يلمجال اثثألل انم ييدع ال  
عبراً نم نوكتت تل او ط مقطو، ر اخف و سلج  
أصرياً ارتاخو، يربك داحوو يرعص تل او ط  
م م. ياسرك يين اثم اعمو لك الل يربك ددصنم  
اهرتشا يذال اثثألل ايم قب اعلم م ماد عفد

م م. اهيلع اثثألل اعضوو لقن ارييس سريخم رضحاً  
ضعب اءرشل شمقل او وقس كليا نيل ام الز هجتا  
ماد ييرتشا ثيح اذجال سابلم ال رجتم نم شمقل او  
هتجوزل ابوتو هتنابل انتسفو ونابل اي صرمق  
كليا ان باح ال ص يمق م م. هسفنل اونل طنبو

اننسا ونجعمو زراو يتز ماد ىرتشا حيتة القبال  
 ماد ىرتاشف يهالكفال ذنع لآخد مٹ ،ةرقب يبلحو  
 وچانمالو الوقتربالو زومال لثم هالكوفال ضعب  
 ىلأ ابهذ مٹ .احفالو بنعالو امالشو يخطببالو  
 ماطمالطو لصببال انهنم ارتاشو ارصخال رجتم  
 عضوو ؤوراتفال ماد عفد .ونمياللو اريخالو  
 ؤاريالسىف اتىرتشمال

### الأسئلة:

- 1- أباهذ ماد انك نيأ ىلأ ؟ (1 mark)
- 2- ماد ىقتل انم عم ؟ (1 mark)
- 3- انىقذالصل لاءست مع ؟ (1 mark)
- 4- سىخم نم ماد بلط انم ؟ (1 mark)
- 5- ارچالان رجتم يىف نيمسرق اذكرو ؟ (1 mark)
- 6- ؤشروال يىف ارچالان لمعى مآذا ؟ (1 mark)
- 7- ضرعمال يىف انىقذالصل داهش انم ؟ (1 mark)
- 8- ضرعمال نم ماد ىرتشرا امقط مك ؟ (1 mark)
- 9- يهالكفال نم ماد ىرتشرا مآذا ؟ (1 mark)
- 10- الخضري من انم راهاشت ما اذكرو ؟ (1 mark)

(10 marks)



## ن يالثا القسّم

### الرسالة : أولاً

يف بنجاحك تبشّره والدك إلى رسالة أكتب  
النهائي الامتحان.

(15 marks)

### الإنشاء : ثانياً

فيه وأكتب الآتيّة الموضوعات من واحداً اختر  
لكلمة 150 عن كلماته تقلل لإنشاء

حياة في الجدي الكينيّ الدسّور أهّية -  
المواطن .

2- كينيّا في إقتصادي كّنشاط الزراعة

3- المجمع في المرأة دور

(15 marks)

3.27 KENYAN SIGN LANGUAGE (504)

3.27.1 Kenyan Sign Language Paper 1 (504/1)

**SECTION A - SIGNED STORY**

VIDEO WATCH /QUESTION QUESTION BELOW ANSWER WRITE// [MARK 15]

- 1 PERSON STORY BORN YEAR \_\_\_\_\_? [MARK 1]
- 2 FROM STORY THIS / FOOD FATHER LOVE MOST WHICH \_\_\_\_\_? [MARK 3]
- 3 FAMILY ALL START FOOD EAT EVENING TIME WHAT \_\_\_\_\_? [MARK 1]
- 4 SISTER PERSON STORY WANT MARRY MAN COMMUNITY WHICH \_\_\_\_\_? [MARK 1]
- 5 MOTHER EXPLAIN FATHER WHAT MAKE ACCEPT DAUGHTER MARRY// [MARK 2]
- 6 FATHER TELL DAUGHTER ASK MAN BRING PARENT HIS DATE WHICH \_\_\_\_\_? [MARK 1]
- 7 FROM STORY THIS / FATHER ASK PARENT MAN BRING THING THING WHAT MOTHER GIVE// [MARK 3]
- 8 FATHER SELF WANT THING THING WHAT FROM PARENT MAN// [MARK 3]

**SECTION B - SIGNED SENTENCES**

VIDEO WATCH SENTENCE SENTENCE WRITE SPACE BELOW// [MARK 10]

**SECTION C - FINGER SPELLING**

VIDEO WATCH / WORD WORD FINGER-SPELL WRITE SPACE BELOW// [MARK 10]

**SECTION A (MARK 10)**

**COMPOSITION**

**TOPIC TWO THERE BELOW / CHOOSE ONE SAME WRITE STORY WORD WORD ABOUT 220 //**

**EITHER**

**1 COMPOSITION WRITE END SENTENCE BELOW //**

..... **FROM DAY THIS ME BECOME NAME BIG FINISH SCHOOL MINE IN //** (MARK 10)

**OR**

**2 YOU HEADBOY OR HEADGIRL SCHOOL YOUR / DAY PARENT VISIT YOU SPEECH GIVE MUST / SPEECH THIS YOU WRITE//** (MARK 10)

**SECTION B (MARK 10)**

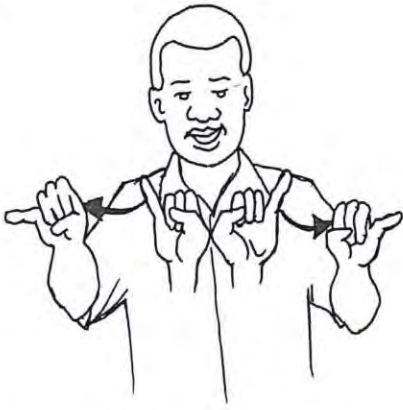
**LANGUAGE USE**

**B1. CROSSWORD PUZZLE BELOW ANSWER CORRECT// [5 MARKS]**

1			2		3				
					4				
			5						
			6				7		
8									
			9						

ACROSS

1.



5.



3.



8.



9.

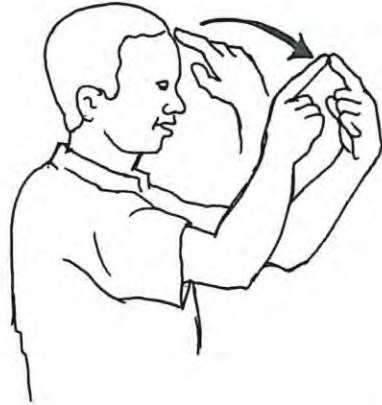


DOWN

1.



2.



4.



6.



7.



**B2. ANSWER QUESTION (i) - (v) CORRECT//**

(i) **SENTENCE BELOW CHANGE KSL GRAMMAR//** [MARK 1]

In this school, children wear blue shirts.

(ii) **SENTENCE TWO BELOW JOIN MAKE SENTENCE ONE//** [MARK 1]

LUCY UGALI EAT//  
JOHN UGALI EAT//

(iii) **SENTENCE BELOW CHANGE SHOW TENSE FUTURE//** [MARK 1]

TIME HOLIDAY ME GO UGANDA FINISH//

(iv) **SENTENCE BELOW OPPOSITE CHANGE//** [MARK 1]

EXAM MATH EASY MORE BUT EXAM ENGLISH HARD//

(v) **SENTENCE BELOW ADVERB UNDERLINE//** [MARK 1]

M-E-TO WALK-SLOW-SLOW/WHY/SICK HEAVY//

**SECTION C (MARK 05)**

**COMPREHENSION**

**STORY BELOW READ / QUESTION ANSWER//**

SUNDAY LAST BEFORE TIME LUNCH / P-E-T-E PHONE T-E-D FINISH / INVITE  
HOUSE HIS COME **FOOD NIGHT** TOGETHER EAT SAME MOVIE WATCH / T-E-D  
HAPPY HAPPY MORE / WHY / PLAN OTHER HAVE NOTHING//

TIME T-E-D LUNCH EAT FINISH SELF DECIDE BICYCLE HIS USE GO MARKET  
TOWN NAME K-I-B-O-K-O FIRST // LATER VISIT P-E-T-E / WHY / DIRECTION  
SAME //

TIME T-E-D ARRIVE HOUSE P-E-T-E/ SELF SEE HOUSE IN DARK LIGHT ZERO SAME  
KNOCK KNOCK KNOCK ANSWER ZERO / T-E-D DISAPPOINT HEAVY / SELF START  
JOURNEY BACK HOUSE HIS//

1 P-E-T-E PHONE T-E-D WHY? [MARK 1]

2 T-E-D KNOW HOW P-E-T-E HOUSE THERE NOTHING// [MARK 1]

3 BEFORE P-E-T-E PHONE T-E-D / T-E-D SELF PLAN DO WHAT? [MARK 1]

4 T-E-D JOURNEY BACK HOUSE HIS HOW? [MARK 1]

5 T-E-D DECIDE GO MARKET FIRST WHY? [MARK 1]

**3.27.3 Kenyan Sign Language Paper 3 (504/3)**

**COMPULSORY**

**QUESTION ONE**

[20 MARKS]

**LANGUAGE PROFICIENCY INTERVIEW**

EXAMINER ASK - YOU QUESTION MANY MANY YOU ANSWER WELL SAME CLEAR//

**QUESTION TWO**

[20 MARKS]

**EITHER**

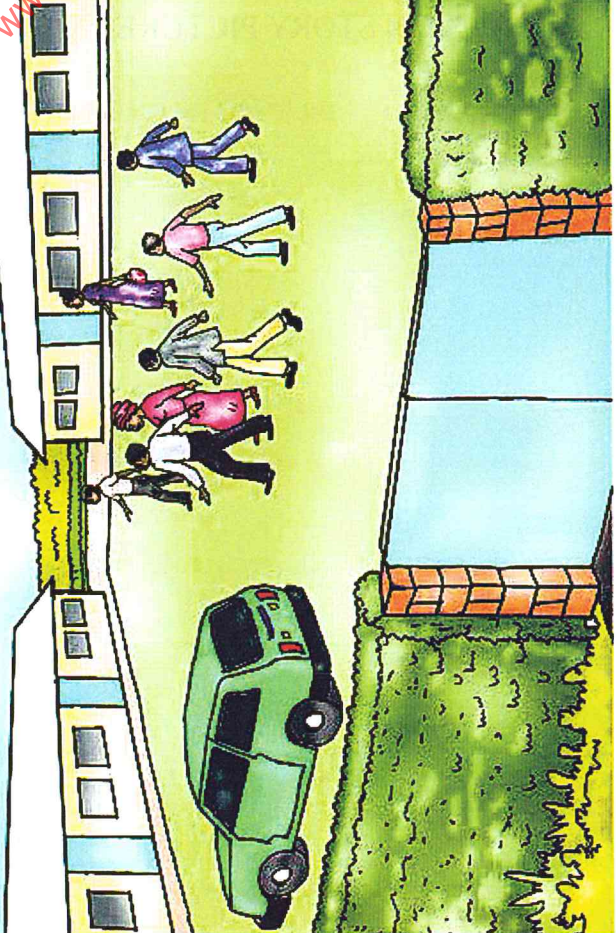
- (a) SCHOOL YOUR DAY PARENT NEAR / HEADTEACHER APPOINT YOU  
FINISH / GIVE RESPONSIBILITY ORGANISE STUDENT  
PREPARE ENTERTAINMENT DIFFERENT DIFFERENT SHOW TIME DAY  
PARENT / SIGN EXPLAIN HOW POSSIBLE DO THIS //

**OR**

- (b) SIGN STORY PICTURE THERE THERE //

[20 MARKS]

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Here is the third play through  
 (Silence: 30 seconds)  
 And now, the fourth and last play through  
 (Silence: 60 seconds)

Test 1 (c): **Rhythm of a melody in compound time.**

You are to write the Rhythm of the following melody on monotone adding time signature and bar lines. It begins on the first beat of the bar. The melody will be played four times.

Here is the dotted crotchet pulse, followed by the first play through.

(Pause: 2 seconds)

(♩ = 56) ♩ ♩ ♩ ♩ ♩ ♩ (Tapped)



(Silence: 30 seconds)

Here is the second play through

(Silence: 30 seconds)

Here is the third play through

(Silence: 30 seconds)

And now, the fourth and last play through

(Silence: 60 seconds)

**TEST TWO: MELODY**

Test 2 (a): **Melody in a major key**

You are to write the following melody in the key of **G** major. The melody will be played through once, then the first phrase will be played twice and the second phrase twice. Finally the whole melody will be played right through once again. Write the treble clef and the key signature of **G** major now.

(Silence: 10 seconds)

The melody is in  $\frac{4}{4}$  time. Write the time signature now.

(Silence: 10 seconds)

The melody begins on the first beat of the bar. Here is the crotchet pulse.

(Pause: 2 seconds)

(♩ = 84) ♩ ♩ ♩ ♩ ♩ ♩ (Tapped)

Here is the tonic chord of G major and the key note, followed by the whole melody.  
(Pause: 2 seconds)



(Silence: 40 seconds)

And now, here is the tonic chord and key-note again, followed by the first phrase.

(Silence: 40 seconds)

Here is the first phrase again.

(Silence: 40 seconds)

Now, here is the keynote and the second phrase.

(Silence: 40 seconds)

Here is the first phrase again.

(Silence: 40 seconds)

Now, here is the keynote and the second phrase.

(Silence: 40 seconds)

Finally, here is the tonic chord followed by the whole melody.

(Silence: 60 seconds)

## Test 2 (b) Melody in a Minor key

You are to write the following melody in the key of A minor. The melody will be played through once, then the first phrase will be played twice and the second phrase twice. Finally the whole melody will be played right through once again. Write the treble clef and the key signature of A minor now.

(Silence: 10 seconds)

The melody is in  $\frac{4}{4}$  time. Write the time signature now.

(Silence: 10 seconds)

The melody begins on the first beat of the bar. Here is the crotchet pulse.

(Pause: 2 seconds)

(♩ = 84) ♩ ♩ ♩ ♩ ♩ ♩ (Tapped)

Here is the tonic chord of A minor and the key note, followed by the whole melody.

(Pause: 2 seconds)



(Silence: 40 seconds)

And now, here is the tonic chord and key-note again, followed by the first phrase.

(Silence: 40 seconds)

Here is the first phrase again.

(Silence: 40 seconds)

Now, here is the keynote and the second phrase.

(Silence: 40 seconds)

Here is the second phrase again.

(Silence: 40 seconds)

Finally, here is the tonic chord and the keynote, followed by the whole melody.

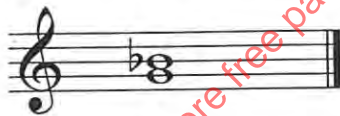
(Silence: 60 seconds)

### TEST 3: INTERVALS

Two intervals will be sounded harmonically. Each interval will be sounded twice. You are to describe each of the intervals.

(Pause: 2 seconds)

- (i) Here is the first interval.



(Silence: 20 seconds)

Here is the first interval again

(Silence: 20 seconds)

- (ii) Here is the second interval.



(Silence: 20 seconds)

Here is the second interval again.

(Silence: 20 seconds)

## TEST 4: CADENCES

There are **four** cadences in this passage which will be played with a pause at each cadential point. You are required to name the cadences in the order in which they occur in the passage.

Here is the tonic chord followed by the first play through.

The musical score is in B-flat major (two flats) and 4/4 time. It begins with a tonic chord (F2, Bb3, D4, F4) in the bass clef. The first system shows a melodic line in the treble clef and a bass line in the bass clef, with a bracket labeled (a) under the final two measures. The second system continues the melody and bass line, with brackets labeled (b) and (c) under the final two measures of the system. The third system concludes the passage with a bracket labeled (d) under the final two measures. A watermark 'for more free past papers visit www.freekcepastpapers.com' is visible across the score.

(Silence: 15 seconds)

Here is the second play through

(Silence: 15 seconds)

Here is the third play through

(Silence: 15 seconds)

And finally, the fourth and last play through

(Silence: 20 seconds)

## TEST FIVE: MODULATION

Test 5 (a) The following melody is in the key of **D Major**. It modulates once away from the tonic key. You are required to name the key to which the melody modulates before returning to the tonic. The melody will be played **three** times.

Here is the tonic chord of **D Major**, followed by the first play through.

(Pause: 2 seconds)

$\text{♩} = 86$



## SECTION A: BASIC SKILLS (32 marks)

Answer questions from *all* sections.

- 1 **Either** (a) Continue the following opening to make a melody of sixteen bars for voice with a modulation to the subdominant before returning to the tonic key. Incorporate tempo variations and a triplet. (12 marks)



- Or (b) Compose a melody and set to it the text below. Add phrase marks to indicate cadential points. (12 marks)

*Oo! safari ya Mombasa  
huvutia watu hasa  
Oo! Mombasa ni Mombasa,  
ulo mji wa fanaka.*

- 2 Harmonize the following melody for Soprano, Alto, Tenor and Bass (SATB). Choose appropriate chords from the following: I, II, IV, V and VI. (20 marks)



## SECTION B: HISTORY AND ANALYSIS (48 marks)

## 3 AFRICAN MUSIC

- (a) (i) Name **three** Kenyan traditional drum ensembles and match each of them with the community that plays it. (3 marks)
- (ii) Several factors influence the naming of traditional dances in the African society. Apart from the accompanying instruments, state **three** other factors. (3 marks)
- (b) Outline **three** roles of music in communal work. (3 marks)

- (c) (i) Outline **two** roles of props as a visual display in the performance of African traditional dances. (2 marks)
- (ii) Name any other visual display used in African traditional dances. (1 mark)
- (d) Name **two** African traditional melodic idiophones. (2 marks)

#### 4 WESTERN MUSIC

Answer **any two** of the following questions (a), (b), (c) and (d)

(a) **Claudio Monteverdi**

- (i) What was Monteverdi's nationality? (1 mark)
- (ii) State **three** characteristic features of *The Coronation of Poppea* opera? (3 marks)
- (iii) Name **two** other operas by Monteverdi. (1 mark)
- (iv) Why were Monteverdi's works regarded as revolutionary? (2 marks)

(b) **George Frederick Handel**

- (i) What type of work is *Music for the Royal Fireworks*? (1 mark)
- (ii) For what purpose was *Music for the Royal Fireworks* written? (1 mark)
- (iii) State **two** reasons why the *Messiah* was well received by the public in London. (2 marks)
- (iv) Name **two** contemporaries of Handel. (1 mark)
- (v) With reference to Handel's style of composition, outline his treatment of:
- I melody; (1 mark)
- II harmony. (1 mark)

(c) **Edward Elgar**

- (i) What was Elgar's nationality? (1 mark)
- (ii) Name his choral work which was based on the Roman Catholic text. (1 mark)



- (iii) For what medium was *Enigma Variations* written? (1 mark)
  - (iv) Explain how Elgar embraced the use of technology in the presentation of his music between 1914 and 1925. (2 marks)
  - (v) Outline any **two** stylistic features of Elgar's music. (2 marks)
- (d) **Sergei Prokofiev**
- (i) Name Prokofiev's first symphony? (1 mark)
  - (ii) What is a symphonic poem? (1 mark)
  - (iii) Name the most popular symphonic poem by Prokofiev. (1 mark)
  - (iv) Outline **four** characteristic features of Prokofiev's piano music (4 marks)

**5 PRESCRIBED AFRICAN TRADITIONAL MUSIC**

*Mijikenda Ensemble* from Folk Music of East Africa.

- (a) Outline **four** features that characterise the singing. (4 marks)
- (b) Describe the performance in relation to the following.
  - (i) Texture; (2 marks)
  - (ii) Call and response; (1 mark)
- (c) Outline **two** roles of the *Upatu* in the performance. (2 marks)
- (d) Describe the ending of the performance. (1 mark)

**6 PRESCRIBED WESTERN MUSIC**

**Recitative:** "*Behold I Tell You a Mystery*"

and

**Air:** "*The Trumpet Shall Sound.*"

From the *Messiah* by George F. Handel.

- (a) Identify the chord formed in bars 1 and 2 of the voice part in the recitative. (1 mark)
- (b) With reference to bar numbers, describe the form of the *Air*. (4 marks)
- (c) State how imitation has been used from Bar 1 to 28 of the *Air*. (1 mark)

(d) State the meaning of the following devices used in the music, citing specific examples from the score.

(i) Word painting; (2 marks)

(ii) Melisma. (2 marks)

**SECTION C: GENERAL MUSIC KNOWLEDGE (20 marks)**

7 (a) Explain how each of the following factors influence the performance of African traditional music.

(i) Modern technology; (2 marks)

(ii) Religion; (2 marks)

(iii) Rural/Urban migration. (2 marks)

(b) State the meaning of each of the following:

(i) Motif; (1 mark)

(ii) Rondo; (1 mark)

(iii) Ululation; (1 mark)

(iv) The '48'. (1 mark)

(c) State the meaning of each of the following in relation to the music industry.

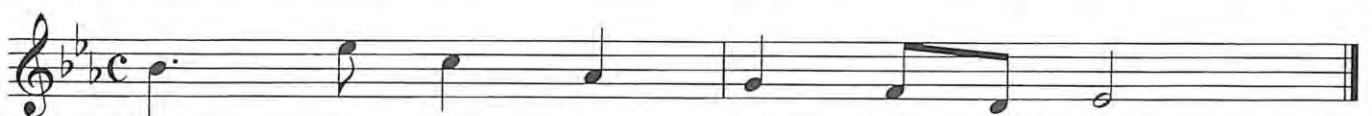
(i) Copyright; (1 mark)

(ii) Royalties; (1 mark)

(iii) Piracy. (1 mark)

(d) (i) State **two** roles of music in advertising. (2 marks)

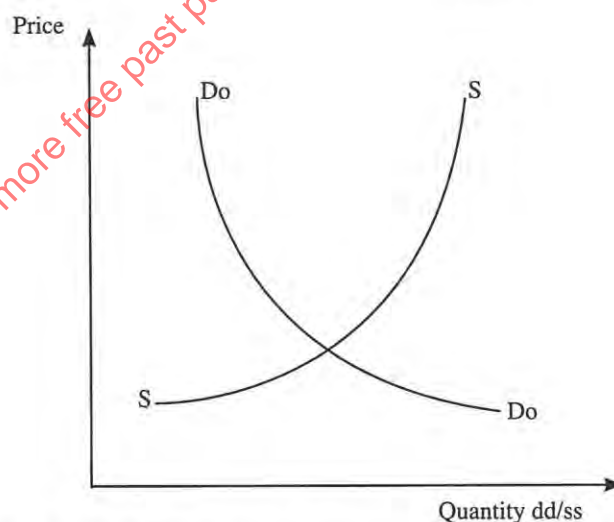
(ii) The following melody is written for the clarinet in B flat. Write it in concert pitch. (5 marks)



### 3.29 BUSINESS STUDIES (565)

#### 3.29.1 Business Studies Paper 1 (565/1)

- 1 What are the reasons that would make an individual engage in business? (4 marks)
- 2 List **four** types of utility and the production activity associated with each of them. (4 marks)
- 3 Outline **four** ways in which the office facilitates effective handling of documents. (4 marks)
- 4 Highlight **four** factors that may influence a consumer to purchase products from a kiosk rather than a supermarket. (4 marks)
- 5 State **four** circumstances under which hire purchase may be used to acquire goods. (4 marks)
- 6 Give **four** reasons for the increased use of mobile phones in banking. (4 marks)
- 7 Outline **four** methods that the Government of Kenya uses to regulate business activities. (4 marks)
- 8 State **four** disadvantages of using internet as a means of communication. (4 marks)
- 9 State **four** differences between life assurance and general insurance. (4 marks)
- 10 Give **four** reasons for observing ethical practices in product promotion. (4 marks)
- 11 The graph given below represents the demand and supply curves of milk:



- State **four** effects of a shift of the demand curve to the right. (4 marks)
- 12 Outline **four** disadvantages that a manufacturer would suffer if wholesalers were eliminated from the chain of distribution. (4 marks)

13 The following balance sheet was incorrectly prepared:

**PEMBE TATU TRADERS  
BALANCE SHEET  
FOR THE YEAR ENDED 31.12.12**

	Ksh		Ksh
Stock	5,000	Furniture	50,000
Bank overdraft	5,000	Debtors	7,000
Cash	<u>9,000</u>	Capital	<u>66,000</u>
	<u>19,000</u>		<u>123,000</u>

Prepare a corrected balance sheet.

(4 marks)

14 The following figures relate to Jumbo Traders for the year ended 31.12.13.

<u>Details</u>	<u>Ksh</u>
Capital (31.12.13)	940,000
Net loss	20,000
Additional investment	420,000
Monthly drawings	5,000

Determine the capital as at 1.01.13

(4 marks)

15 Identify the ledgers in which the following accounts are maintained.

(5 marks)

	ACCOUNT	LEDGER
(i)	Pendo (Debtor)	
(ii)	Machinery	
(iii)	Rent	
(iv)	Capital	
(v)	Juma (Creditor)	

16 List **three** levels of inflation.

(3 marks)

17 Name the documents described by the statements given below as used in International Trade: (4 marks)

- (a) Requests for payment before goods are delivered.....
- (b) Shows ownership or title of goods imported.....
- (c) Shows the country of manufacture of goods.....
- (d) Shows the transportation charges for goods.....

18 The following Purchases Returns Journal relates to Farasi Traders:

PURCHASES RETURNS JOURNAL				
DATE	DETAILS	CREDIT NOTE NO.	FOLIO	AMOUNT
2012				
MARCH				KSH
1	Junior	R22	PL1	2,000
3	Mimi Supplies	100	PL 2	4,000
4	Kilimanjaro	30	PL 5	5,000
			GL 4	<u>11,000</u>

Post the information above to the relevant ledger accounts. (4 marks)

19 Outline **four** goals of development to a country. (4 marks)

20 The following information relates to Kahawa Traders as at 31<sup>st</sup> December 2012.

Stock	1.1.12	Ksh	80,000
Stock	31.12.12	Ksh	120,000
Purchases		Ksh	1,000,000
Margin			20%

Required:

Prepare a trading account. (5 marks)

21 State **four** reasons that make it necessary for firms to maintain a healthy environment. (4 marks)

22 Highlight **four** benefits of a business plan to an entrepreneur. (4 marks)

23 Outline **four** benefits of sea transport over air transport. (4 marks)

24 In which ways can an investor benefit from the stock exchange? (4 marks)

25 State **three** clauses found in the Memorandum of Association. (3 marks)

**3.29.2 Business Studies Paper 2 (565/2)**

- (a) Explain **five** uses of National Income Statistics to a country. (10 marks)
- (b) Discuss **five** principles that would lead to effective use of government resources. (10 marks)

**2** (a) Explain **five** ways in which the consumer may benefit from warehousing. (10 marks)

- (b) The following information was extracted from the books of Mamboleo Traders in the month of September, 2014.

September 1	Had cash in hand, Shs15,500 and a bank overdraft of Shs 9,700.
September 3	Bought goods for sale Shs 12,300 on credit.
September 5	Sold good in cash Shs 8,500.
September 9	Sold goods on credit Shs 10,000.
September 12	Received a cheque of Shs 9,000 from a debtor.
September 15	Paid a creditor Shs 10,000 in cash.
September 17	Paid wages Shs 2,600 in cash.
September 19	Received a cheque Shs 23,400 from Samson for goods sold in January.
September 20	Received Shs 6,700 from a debtor in cash.
September 23	Withdrew Shs 7,700 from the bank for office use.
September 24	Paid electricity bills by cheque Shs1,200.
September 25	Received a cheque of Shs11,500 from a debtor.
September 26	Made cash sales of Shs12,800 .
September 27	Purchased goods worth Shs 8,950 in cash.
September 28	Deposited personal cash Shs 3,500 into the business account.
September 30	Paid water bills by cheque Shs 2,800.

**Required:**

Prepare a two column cash book. (10 marks)

- 3** (a) Describe **five** characteristics of a monopolistic competitive market. (10 marks)
- (b) Explain **five** features of human wants. (10 marks)

- 4 (a) The following trail balance relates to Chui Traders as at 31<sup>st</sup> December, 2014.

**Chui Traders  
Trial Balance  
As at 31<sup>st</sup> December 2014**

Details	Dr (Ksh)	Cr (Ksh)
Stock	10,000	
Bank	3,500	
Purchases	15,000	
Sales		28,000
Returns	800	1,100
Rent		580
Insurance	950	
Creditor		450
Carriage in	1,200	
Discounts	300	1,620
	<u>31,750</u>	<u>31,750</u>

Additional Information:

- Closing stock was valued at Ksh 2,500.
- Carriage out was Ksh 1,200.

**Required**

Prepare Trading, Profit and Loss Account. (10 marks)

- (b) Explain **five** methods of determining the price of a product other than price control. (10 marks)

- 5 (a) Explain **five** trends in office management. (10 marks)

- (b) Explain **five** advantages of government involvement in business. (10 marks)

- 6 (a) Explain **five** benefits which may accrue to Kenya by being a member of the African Development Bank (AFDB). (10 marks)

- (b) Explain **five** features that are common to underdeveloped countries. (10 marks)