BIOLOGY PAPER I
(SET I)
MARKING GUIDE
553/1

SECTION A

1 A	11 C	21 C
2 C	12 D	22 B
3 D	13 C	23 D
4 C	14 B	24 D
5 A	15 D	25 C
6 B	16 D	26 C
7 C	17 C	27 D
8 B	18 C	28 A
9 C	19 C	29 D
10 C	20 A	30 B

@ 1mark (30)

SECTION B

31(a) A - upper surface has fewer stomata than lower surface; / or Lower surface has more stomata than upper surface.

• Rej - Stating the numbers.
- Should imply both surfaces posses stomata / Comparisin

B - No stomata on upper surface; but very many on the lower surface; ✓

C - No stomata on upper surface; but many on the lower surface; ✓

B and C - Indicate the comparison on the number of stomata on their lower Sufaces, with B having more. ½ @

03

b)

A - Both surfaces posses stomata through which water is lost; however, both surfaces seem to lose water at almost same rate; even if the upper surface has less stomata. This is because the upper surface are exposed directly to Environmental conditions; like (wind) light, that increase the rate of transpiration;

B - No stomata on upper surface and no transpiration (completely); this is because the leaves have a thick cuticle; that completely prevent water loss, the lower surface however transpires mainly through the very many stomata;

C - The upper surface had no stomata but still lost water; This is because it had either a thin cuticle or no cuticle; ~~stomata~~, which allow water to Escape. The lower Sufaces transpired mainly through the ~~stoma~~ many stomata; ✓

10

1 mark @

31-(c) A-Reduced / decreased rate of transpiration ; ✓
B-No change in the rate of transpiration ; ✓
C-Reduced / decreased rate of transpiration ; ✓
1 mark @ 03

(d) Plant species B ✓ because it doesn't lose water through the upper epidermis ; ✓ due to presence of a thick cuticle
1 mark each 02

(e) - Sunken stomata
- Reduced size of leaves
- Thick cuticle
- Shading off of leaves
- Roll / fold leaves
- Shiny surface
- Hairy leaves
- Opening stomata at night and close during day

any 2 @ 1 mark 02

Total 20

32(a) A - Grows straight ; ✓

B(i) Bent towards light ; ✓ (Should indicate direction of the bend.)

(ii) No growth / No change ; ✓

(iii) Grows straight ; ✓

C. Bent towards the side with the tip ; ✓ (Should indicate direction of the bend)

each ½ mark x 5

02½

(b) A - Auxins remain uniformly distributed ; ✓ because the shoot was receiving the light uniformly ; ✓

B(i) - light caused the auxin to move more on the darker side ; ✓ that grew faster than the illuminated side ; ✓ hence leading to the shoot bending towards light ; ✓

B(ii) - When the tip is cut off, the auxins which are growth substances ; ✓ are taken away ; ✓ hence the shoot didnt grow ; ✓

B(iii) The black polythene prevented light from reaching the tip of the shoot ; ✓ this made the auxins to remain uniformly distributed ; ✓ hence shoot continued to grow straight ; ✓

C - Auxins were on the cut tip ; ✓ so when the tip was placed on one side. this side aquired more auxins ; ✓ leading to this side growing faster than the side with tip ; ✓ hence bending towards that side ; ✓

Total 07½

max 06½

½ mark @

(c) The shoot to grow toward the direction of light to receive light for photosynthesis ; ✓ 01

Total (10)

33 (a) A - Aorta ; ✓+
B - Vena cava ; ✓+
C - Pulmonary artery ; ✓+
D - Left Ventrical ; ✓+
E - Right aericle / atrium ; ✓+
F - Coronary artery ; ✓+ ½ @ x 6 03

(b) ~~Blood~~ pumps blood to the rest of the body ; ✓

F - Supplies the heart muscles with blood containing nutrients and oxygen ; ✓ 02

(c) • Has thick (cardiac) muscles ; that ✓+ the generate alot of Pressure ; when ✓+ it contracts
• A wall supplied with blood vessels ; ✓+ that Supply the muscles with nutrients and oxygen ; ✓+ ~~need for~~ 02

(d) Structural difference.
• mammalian heart has 4 chamber while the heart of fish has 2 chamber ; ✓

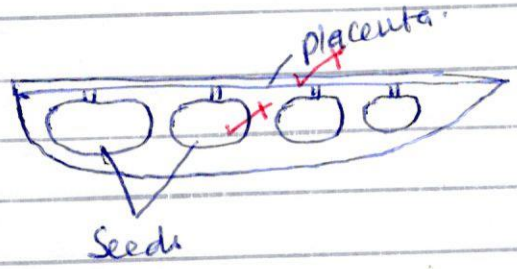
Functional difference
• ~~Mamm~~ Blood circulates around the mammalian heart twice (double circulation) but ~~more~~ passes around the heart of fish one (single circulation) in every cycle ; ✓ 02

(e) - Coronary disease ✓
- ~~Heart~~ attack / Cardiac arrest. any 01 (10)

SECTION C

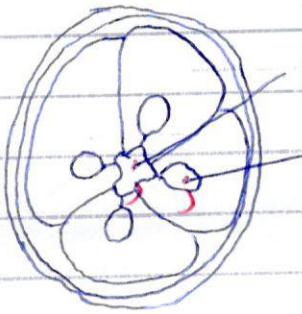
34(a) This refers to the arrangement of seeds on the placenta of fruits ✓/ arrangement of ovules on the placenta of the ovary of flowers.

b) (i)



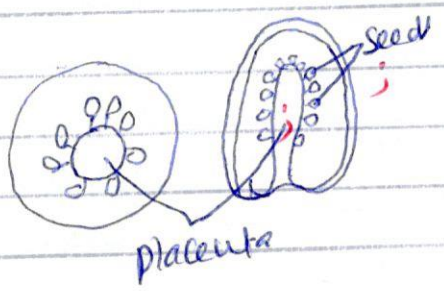
• Seeds attached along the placenta; found on ~~one~~ ~~side~~; of the ~~pod~~ margin; of the pod.

(ii)



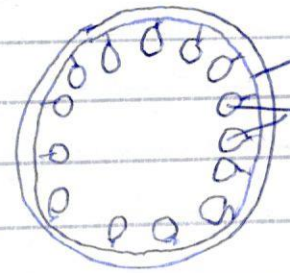
• Seeds radially attached on the placenta; centrally placed; with seeds pointing outwards;

(iii)



• Seeds randomly attached on the placenta; that Emerges from the base- centrally; but remain suspended; in ~~the~~ fruit chamber;

(iv)



• Seeds attached on the placenta located around the Pericarp; The seeds point inwards; ½ @ ×20 10

(c) - Reduces overcrowding; ✓ 1mark @
- Facilitate colonisation of new areas; ✓
- Reduces competition for resources; ✓
- minimises the spread of diseases; ✓ 04

15

35(a) A meal of posho and beans consist of starch, proteins and lipids
- When food is placed in the mouth, it's chewed; to increase surface area, then food is mixed with Saliva;
- Saliva contains an enzyme Salivary amylase; that breaks down/hydrolyses starch to maltose;
- The food is then swallowed, into the ~~duodenum~~ oesophagus; where starch digestion by Salivary amylase;
- The food then enters the stomach; where the stomach wall release gastric juice; containing Enzymes Rennin and pepsin; ~~At~~ this point pepsin acts on proteins hydrolysing them to peptides (polypeptides);
- From the stomach food enters the duodenum; where the gall bladder release bile that emulsifies the lipids; and the pancreas release the pancreatic juice; that contains the following enzymes;
- Pancreatic amylase hydrolyses the remaining starch to maltose;
- Trypsin, that hydrolyses the remaining proteins to peptides
- Pancreatic lipase that hydrolyses lipids to fatty acids and glycerol;
- The food is then passed on to the ileum; whose walls release a juice called Succus entericus; that contain several enzymes among which are;
- Maltase that hydrolyse maltose to glucose;
- peptidases that hydrolyse peptides to amino acids;
- lipases that hydrolyse the remaining lipids to fatty acids and glycerol;

NB: Rej use of fats for ~~oil~~ lipids
Acc: Oils for lipids

Total 10
Max 07

35(b) • Glucose can be oxidised to release energy; used by the body, Excess Glucose is converted to glycogen; then Stored in the liver or muscles; any more Excess is Converted to fats; and Stored under the Skin; (in adipose tissues)

• Amino acids are re-assembled into protein's; used for body building; or production of body Secretion like hormones / Enzymes

• The remaining aminoacids are de-aminated; release amino group that is released in urine as urea; the remaing part Converted to glucose;

• fatty acids and glycerol can be oxidised to release energy; or assembled to build body Structures; Excess is Stored; in adipose tissues under the Skin. 6½

MAX 05

(C) - Have 4-chambered Stomach; to ensure maximum digestion;
- Chew cud; to increase digestion efficiency;
- Rumen has Cellulose ~~digesting~~ Polysaccharide bacteria; that help them digest Cellulose;
- Have Sharp ridged molars and premolars; that grind food thoroughly well;

any 3×01

03

15

36(a) • Some forms of bacteria facilitate the decomposition; of dead organic matter, facilitating the re-cycling; of nutrients

• Some bacteria converts useable nitrogen gas to nitrates; (nitrogen fixation) so that the nitrates can be used by plants; to make proteins

• Some bacteria (nitrifying) converts ammonia produced during decomposition to useable; form of nitrates;

• Some bacteria restores the composition of nitrogen; in air by converting nitrates back to nitrogen gas;

• During decomposition by some bacteria, CO_2 gas; is released which can be used by plants during photosynthesis. ;

• Soil organisms like earthworm, creat tunnels; that increase soil ~~are~~ aeration, drainage and capillarity;

• They turn over the soil, improving soil texture, drainage, capillarity and aeration; ½@ any 5 × activity = 05

• Their wastes; add humus to soil; Acc. Activity alone rej effect alone.

ACTIVITY	DESCRIPTION / EXP.	EFFECT
(b) • Monocropping;	- Use of same minerals;	leading to soil exhaustion of particular minerals;
• ploughing up & down the hill;	- Creats channels; for runoff water	• Increases erosion;
½@ any 10 • Excess use of fertilizers;	• Accumulation of; certain minerals	• Affect soil structure/pH;
• Deforestation;	- Exposes soil;	- Soil erosion / leaching;
• Overgrazing;	- Exposes soil; - loosens soil;	- Soil erosion;
• Overcultivation;	- loosen soil;	- Soil erosion;
• Construction / mining / Irrigation	- Creats channels for runoff water;	- Soil erosion;
• Bush burning;	- Exposes soil;	- Soil erosion; 05
• Human wastes;	- Chokes soil;	- Reduces aeration, drainage, capillarity

36 (c) Polythene are non-biodegradable; so when they accumulate or dumped in the soil affects / blocks; air and water spaces and passages, depriving plants of water; and oxygen is deprived from soil organisms for respiration; When burnt; release toxic gases; that may kill organisms; polythene can block drainage channels; leading to floods. ;

½ @ 5

max 05

15

37 @ It removes waste products from the body that if left to accumulate would become toxic / affect body systems / for cells ; 02

b) In humans urine is produced by functional units found in the kidney known as nephron ;

Blood entering the nephrone through the afferent vessel is under high pressure ; This blood meets resistance of the coiling of the glomerulus ; this leads to small components of ~~blood~~ substances in blood ; like, glucose, amino-acids, vitamins, urea, uric acid, water, mineral ions, to pass through the pores ; of the glomerulus, then collect in a cup-shaped structure called the bow-mans capsule ; as glomerular filterate ;

The filterate then passes through the proximal convoluted tubules ; where ;

- All glucose is re-absorbed actively ;
- All amino acids re-absorbed actively ;
- Some vitamins and ions are also re-absorbed actively ;
- The re-absorption of mineral ions leads to equivalent re-absorption of water by osmosis ;

The remaining filterate continues to the loop of Henle ; where ~~mineral~~ ions are re-absorbed actively ; followed by water osmotically ;

The re-absorption of mineral ions and water continues in the distal convoluted tubule ; then the collecting duct

The remaining fluid now referred to as urine is poured into the ~~gall~~ urinary bladder ; ½ @ 09

(i) - Re-use waste products produced. (use CO_2 produced in resp.) ;
- less metabolically active. produce less waste (stationary) ;
- They produce only what they need. being autotrophic ;
- They don't take in protein / food they leads to production of waste ; 15