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553/1
Biology
Paper 1
July/August 2023
2½ hours

BUGANDA EXAMINATION COUNCIL MOCKS

Uganda Certificate of Education

BIOLOGY

PAPER 1

2HOURS 30 MINUTES

INSTRUCTIONS TO CANDIDATES

- *Answer all questions in section **A** and **B** and choose any **two** questions in section **C**.*
- *In section **A** circle the correct alternative.*

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1. The scientific names of some animals are listed

1. Ccamelus dromedarius
2. Camelus ferus
3. Equus ferus
4. Struthio camelus

Which animals are in the same genus?

A. 1, 2 and 3 B. 1, 2 and 4 C. 1 and 2 only D. 2 and 3 only

2. The blood vessels in the human body are all parts of the same

A. cell B. organ C. organ system D. tissue

3. By which process do oxygen and carbondioxide move between cells and capillaries?

A. breathing B. diffusion C. excretion D. respiration

4. A cylinder of potato tissue was placed in a beaker of very salty water. After one hour the mass of the potato cylinder had decreased. Why did this happen?

A. salt entered the plant tissue by active transport
B. salt left the plant tissue by osmosis
C. water entered the tissue by active transport
D. water left the plant tissue by osmosis

5. Starch is digested by amylase in the mouth, but it is not digested in the stomach. What is the reason for this?

A. all starch digestion is completed in the mouth
B. the pH in the stomach is not suitable for the amylase to work
C. the starch does not stay in the stomach long enough to be digested
D. the temperature in the stomach is not suitable for the amylase to work

6. A plant with striped leaves was kept in bright light for six hours

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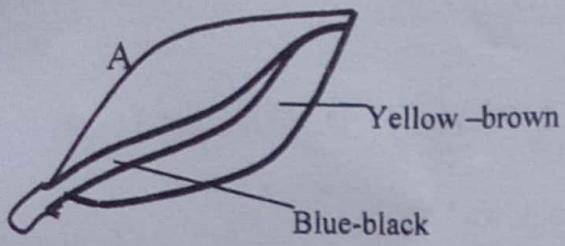
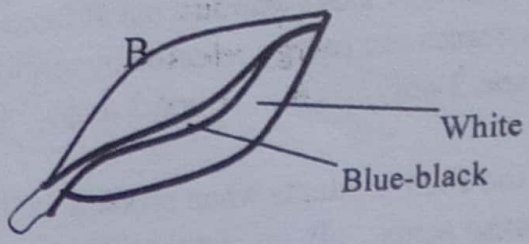
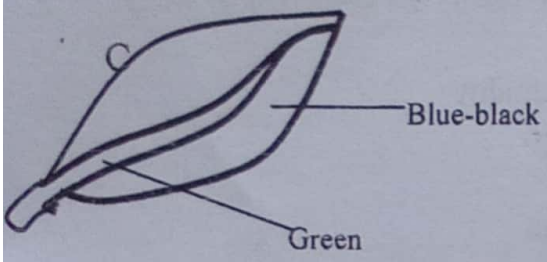
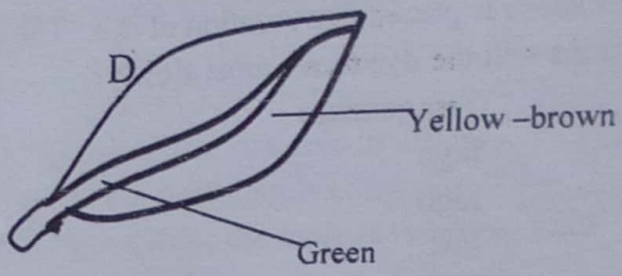
leaf was then detached and tested for starch. Which diagram shows the result of the test?









Which statement describes a catalyst?

A. a substance that decreases the rate of a chemical reaction and is not changed by the reaction

B. a substance that decreases the rate of a chemical reaction and is changed by the reaction

C. a substance that increases the rate of a chemical reaction and is changed by the reaction

D. a substance that increases the rate of a chemical reaction and is not changed by the reaction

What is the function of some white blood cells?

A. to carry glucose B. to carry oxygen

C. to produce antibodies D. to produce antibiotics

What is the transmission of genetic information from generation to generation called?

A. fertilization B. meiosis C. inheritance D. reproduction

). In humans, where does most of the absorption of digested food take place?

A. colon B. kidney C. liver D. ileum

. Where does most of the absorption of water take place in the alimentary canal?

A. colon B. oesophagus C. small intestine D. stomach

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12. The list shows some processes that take place in a human body

1. production of new red blood cells
2. transmission of nerve impulses
3. diffusion of gases into and out of lungs

Which processes use energy released by respiration?

A. 1 and 2 only B. 1 and 3 only C. 2 and 3 only D. 1, 2 and 3

13. What are the final products when proteins are broken down?

A. amino acids B. fatty acids C. glycerol D. simple sugars

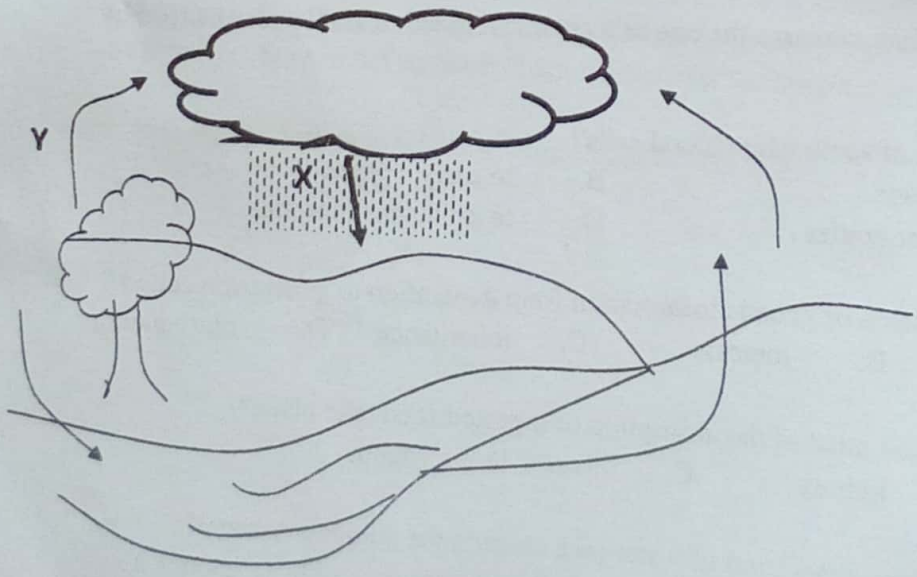
14. A plant shoot is placed in a solution of dye. The dye moves up the stem. Under which conditions will the dye move most slowly?

	Temperature	Humidity
A.	high	high
B.	high	low
C.	low	high
D.	low	low

15. What is produced by anaerobic respiration in humans?

	Alcohol	Carbodioxide	Lactic acid
A.	No	Yes	No
B.	Yes	Yes	No
C.	No	No	Yes
D.	No	Yes	Yes

16. The diagram below shows stages in the water cycle



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Which process is represented by letter **X** and **Y** respectively?

A. condensation and evaporation
B. evaporation and condensation
C. precipitation and transpiration
D. transpiration and condensation

17. What is an example of a population?
A. all arthropods in a pond
B. all the crocodiles in a river
C. all the plants in a wood
D. all the zebras that lived from 1990-2010

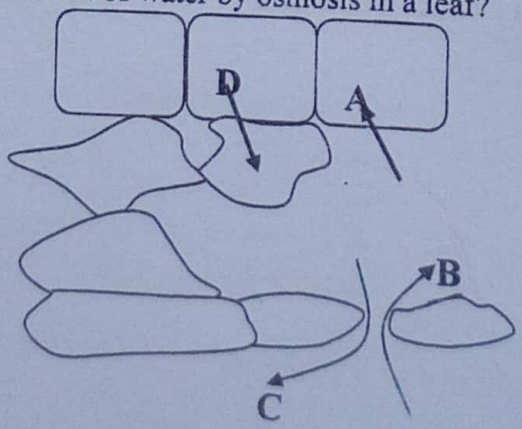
18. Which process is slower than normal in a person with very few platelets?
A. antibody formation
B. blood clotting
C. oxygen transport
d. phagocytosis

19. The horse, Equus ferus and the donkey Equus asinus, are able to interbreed. The offspring they produce is called a mule. Which statement is correct?
A. the horse and the donkey are the same genus; the mule is infertile
B. the horse and the donkey are the same species; the mule is infertile
C. the horse and the donkey are the same genus;, the mule is fertile
D. the horse and the donkey are the same species; the mule is fertile

20. What is respiration?
A. breathing
B. giving out carbondioxide
C. releasing energy from food
D. taking in oxygen

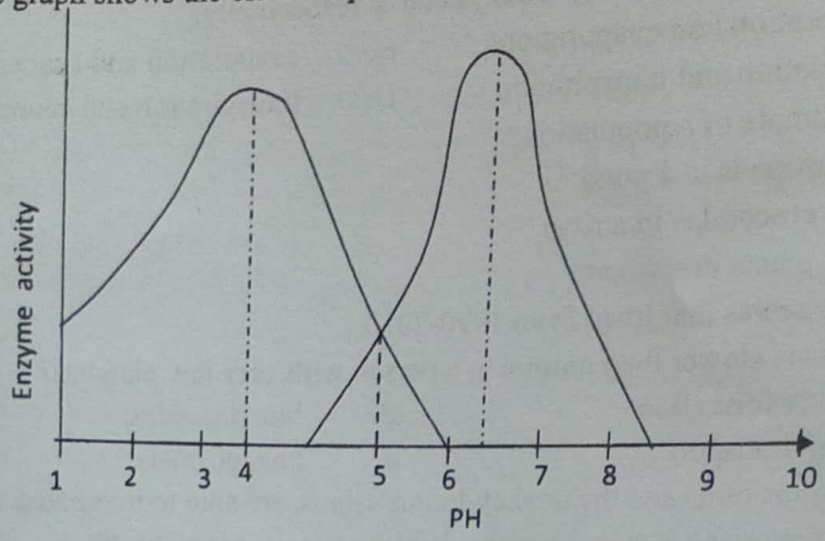
21. Osmosis is defined as the diffusion of water molecules;
A. down their concentration gradient through a partially permeable membrane
B. down their concentration gradient through a permeable membrane
C. up their concentration gradient through a partially permeable membrane
D. up their concentration gradient through a permeable membrane

22. The diagram below shows part of a section through a leaf. Which arrow shows the direction of movement of water by osmosis in a leaf?



A.
B
C.
D.

23. The graph shows the effect of pH on the activity of two enzymes



At which pH is the activity of both enzymes the same?

A. 1 B. 3 C. 5 D. 8

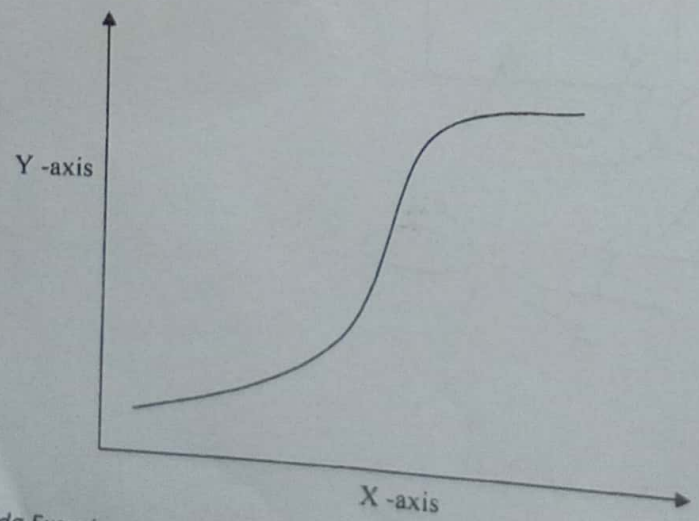
24. Which form of energy is stored within glucose molecules made during photosynthesis?

A. chemical B. heat C. light D. mechanical

25. When the body temperature rises above 37°C, which changes return the temperature to normal?

	Activity of sweat glands	Blood vessels near skin surface
A.	decreased	constricted
B.	decreased	dilated
C.	increased	constricted
D.	increased	dilated

26. The graph shows the growth of a child into an adult



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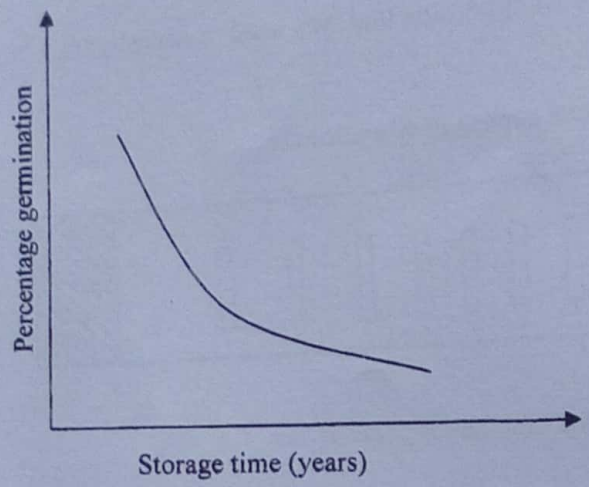
What should be the labels on the axes?

	x-axis	y-axis
A.	age	date
B.	age	mass
C.	mass	age
D.	mass	time

27. The graph below shows the effect of storage time on the percentage of germination.



What can be concluded from this graph?

A. older seeds do not germinate
B. older seeds germinate better than younger seeds
C. younger seeds always germinate
D. younger seeds germinate better than older seeds

28. What results from meiosis of a diploid cell?

A. genetically different diploid cells
B. genetically different haploid cells
C. genetically identical diploid cells
D. genetically identical haploid cells

29. A natural method of birth control assumes that sperms live for three days after intercourse, ovulation occurs between days 13 -15 of the menstrual cycle and released ova live for 36 hours. On which day of the cycle should intercourse not result in pregnancy?

A. day 7
B. day 10
C. day 12
D. day 16

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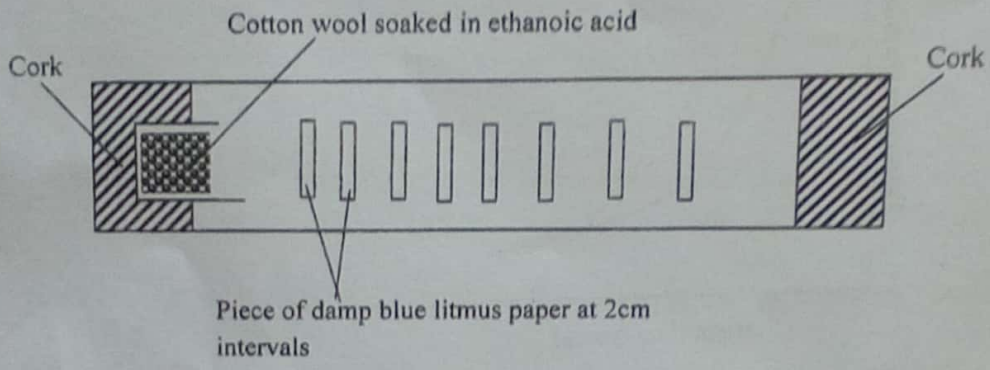
30. What is an advantage of a short food chain?

A. a few producers can support a large number of consumers
B. it is easier for consumers to find food
C. less energy is lost in the food chain
D. less food is required by the consumers

SECTION B (40 MARKS)

31. The diagram below shows an apparatus that was used to investigate a biological process



The pieces of damp blue litmus paper along the table turned red. Three different samples of ethanoic acid A, B and C were used in this investigation. The table below shows the results

Distance of litmus paper (cm)	Time for litmus paper to turn red (seconds)		
	A	B	C
2	5	3	9
4	10	5	18
6	15	8	28
8	20	10	35
10	26	13	45
12	31	15	55
14	36	18	63
16	41	20	72

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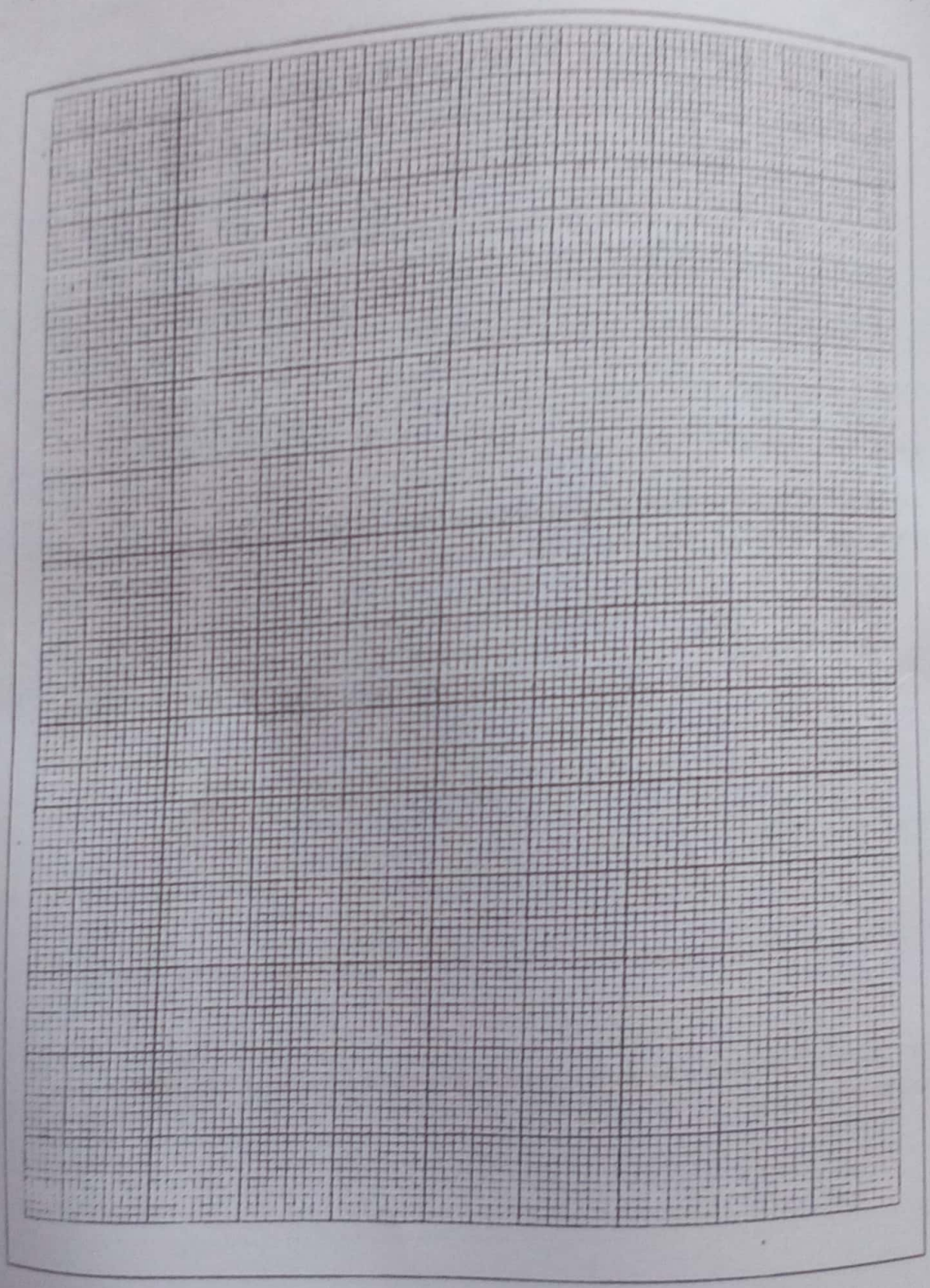
(a)(i) Plot graphs (on the same axes) to represent the information in the table above. (7marks)



(ii) Which process was being investigated in the experiment? (1mark)

.....

(iii) State which sample of ethanoic acid took the longest time to travel 16cm along the tube? (1mark)

.....

(iv) Which factor affecting the process above was being studied? (1mark)

.....

(b) Suggest the sample of ethanoic acid that was;

(i) the most concentrated..... (1mark)

(ii) least concentrated..... (1mark)

(c) Calculate the rate of movement of each ethanoic acid sample using the damp litmus paper placed at a distance of 1 0cm. (show your working) (6marks)

.....

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(d) What general conclusion can be drawn using your answer in **b** and **c** above? (1mark)

.....

(e) From your graph determine the time it would take sample **C** to travel 5cm along the tube. (Show your working) (1mark)

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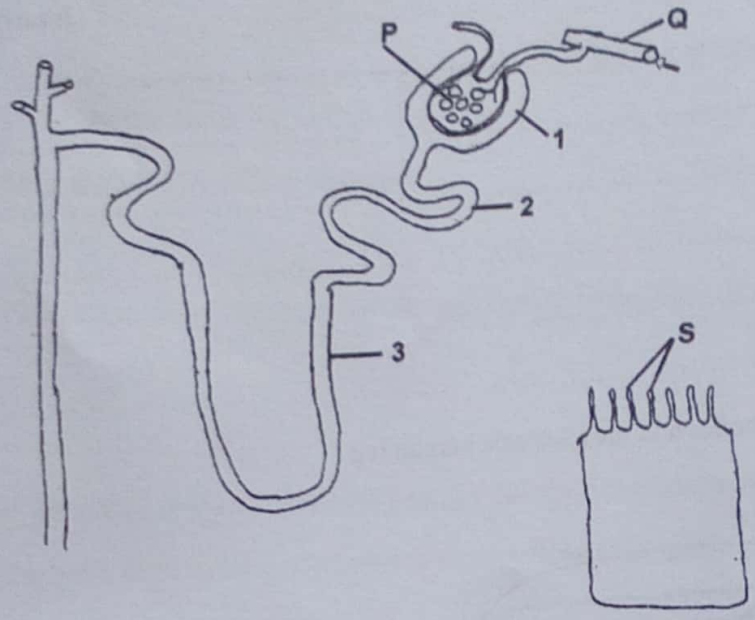
32. Study the figure below and answer the questions that follow



(a)(i) State the name of structure **P**. (1mark)

.....

(ii) Blood vessel **Q** has the highest blood pressure. Suggest why? (1mark)

.....

(iii) The structures labeled **S** are microvilli on cells in region 2.

Explain the importance of the microvilli on the surface of these cells. (2marks)

.....

.....

(b) With a reason suggest whether you would expect amino acids to be present in region 2? (2marks)

.....

(c) The kidneys are examples of organs that maintain a constant internal environment

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(i) State the term for maintaining a constant internal environment in organisms. (1mark)

.....

(ii) Explain how the body controls the blood glucose concentration of a person who has not eaten for a day. (3marks)

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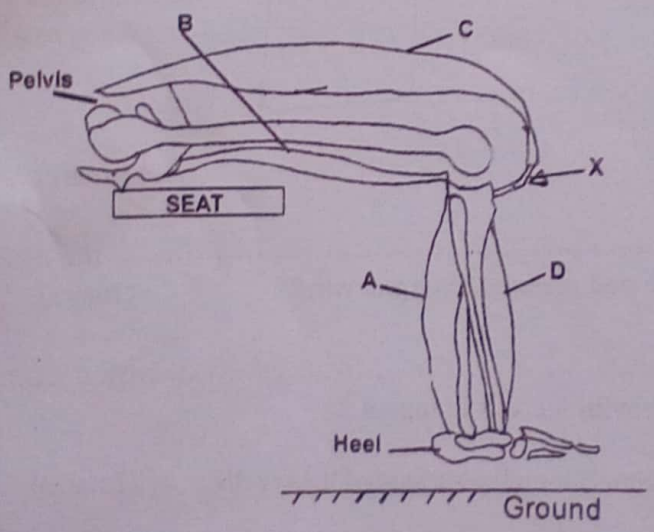
33. The figure shows the bones and muscles of a human leg



(a) Muscles in the leg work antagonistically

(i) State which muscle is antagonistic to muscle A. (1mark)

.....

.....

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(ii) Explain what is meant by antagonistic muscles. (2marks)

.....

.....

(b) In the figure, the person is sitting with the foot clear on the ground. If a sharp tap is given at **X** then the lower leg swings forwards.

(i) State the identity of this response. (1mark)

.....

(ii) Outline the general features of the response identified in b (i) above. (2marks)

.....

.....

(iii) If the spinal cord is cut through near the chest, this response still takes place.

Suggest where in the central nervous system this response is coordinated. (1mark)

.....

.....

(c) In an emergency, such as seeing a snake in a classroom, a person might have to run suddenly and very quickly

(i) Name the hormone that the body releases in such an emergency. (1mark)

.....

(ii) Explain why any listed change needs to occur in the body in such an emergency. (3marks)

.....

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SECTION C (30 MARKS)

Answer any two questions. Additional questions answered will not be marked.

34(a) Differentiate between; (6marks)

(i) inheritance and genetics
(ii) complete dominance and co-dominance
(iii) heterozygote and heterozygous

(b) Two black guinea-pigs are mated together on several occasions and their offspring are all black. However, when their black offspring are mated with white guinea-pigs, half of the mating result in ALL black litters and the other half produced litters containing equal numbers of black and white babies.

Using genetic diagrams show the results of all the mating above. (9marks)

35(a) Explain how the human gas exchange system is protected from possible infections by pathogens like bacteria and damage by particles like dust in inhaled air. (5marks)

(b) Compare inspiration and expiration in man. (7marks)

(c) State the importance of gas exchange in amoeba. (3marks)

36(a) Outline three functions of the human skin. (3marks)
(b) How is the human skin suited to its function? (12marks)

37. At puberty both girls and boys experience physical, physiological and emotional changes preparing them for parenthood.

(a) Suggest the reproductive importance of any three changes in both boys and girls. (12marks)

(b) State the hormones responsible for the changes in both girls and boys and the glands that produce them. (3marks)

END

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