



Yesmark tuition services

BIOLOGY 2016

Paper 1

(THEORY)

2 hours

Instructions to Candidates:-

- (a) Write your name and index number in the spaces provided above.
- (b) Sign and write the date of examination in the spaces provided above.
- (c) Answer **ALL** the questions in the spaces provided.
- (d) **This paper consists of 16 printed pages.**
- (e) **Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**

For Examiner's Use Only

Questions	Maximum Score	Candidate's Score
1 - 30	80	
Total Score		

1. Distinguish between habitat and ecological niche as used in ecology. (1 mark)

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2. (a) Give **two** unique features of organisms under the kingdom Monera. (2 marks)

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(b) What is the biological significance of alternation of generations in the Division Pteridophyta. (1 mark)

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3. Explain how the grana of the chloroplast is adapted to its function. (2 marks)

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4. Which mammalian blood components contain the following. (3 marks)

(i) Fibrinogen?

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(ii) Thrombin?

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(iii) Thrombokinase?

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5. State **two** functions of the ciliary body in the human eye. (2 marks)

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6. Give the type of joint formed and the bone located on the proximal end of the humerus. (2 marks)

- Type of Joint.

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- Bone

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7. The paddles of whales and fins of fish adapt these organisms to aquatic habitats.

(a) Name the evolutionary process that may have given rise to these structures. (1 mark)

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(b) What name is given to such structures in evolution? (1 mark)

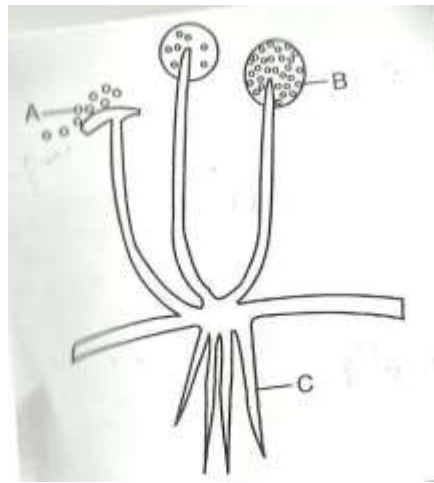
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8. The malaria parasite exhibits alternation of hosts. Give the identity of the main hosts. (2 marks)

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9. Name the **two** types of chromosomes found in the body cells of higher animals. (2 marks)

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10. Give **two** functions of the hormone ecdysone in insects. (2 marks)

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11. The diagram below represents a mature organism observed by Form 3 students during a practical lesson. Use it to answer the questions that follow.



(a) To which kingdom does the organism belong? (1 mark)

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(b) Give **two** functions of the structure labelled C. (2 marks)

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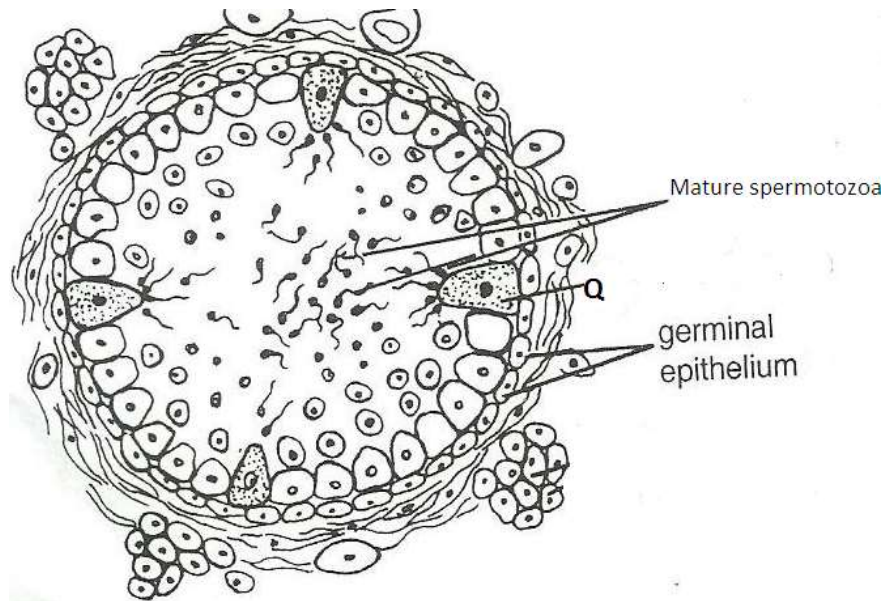
12. Haemophilia is genetic disease transmitted by a recessive gene h linked to the X chromosome. A woman who is a carrier for haemophilia gene married a normal man. Work out the genotypes of their first generation offspring. (4 marks)

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13. State **two** homeostatic functions of the human skin. (2 marks)

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14. The diagram below represents a structure obtained from the male reproductive system. Use it to answer the questions that follow.



- (a) Identify the structure labelled Q. (1 mark)

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- (b) Give the functions of the following hormones in human males.
(i) Follicle Stimulating Hormone (F.S.H). (1 mark)

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- (ii) Interstitial Cell Stimulating Hormone. (I.C.S.H). (1 mark)

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15. Which cell organelle in each case performs the following cellular functions.

- (i) Production of A.T.P? (1 mark)

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- (ii) Secretion of synthesized substances? (1 mark)

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16. In a certain flowering plant, the number of chromosomes in each cell of the radicle is 14. State the number of chromosomes in: (3 marks)

- (i) The zygote.

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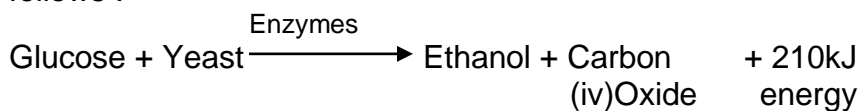
- (ii) One cell of the endosperm.

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- (iii) Generative nucleus.

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17. The equation for anaerobic respiration involving one glucose molecule is as follows :-



(a) If $33.6\text{kJ} = 1$ molecule of A.T.P, calculate the number of glucose molecules required to produce 25 molecules of A.T.P. (2 marks)
(Show your working).

(b) Why is anaerobic respiration inefficient in producing energy. (1 mark)

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18. Identify and state the actual respiratory surfaces used by the following animals. (3 marks)

(i) Locust.

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(ii) Tilapia.

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(iii) Fresh water amoeba.

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19. Name the type of response shown by the following organisms as described:-

(i) Leaves of Mimosa pudica fold when touched. (1 mark)

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(ii) Sperm cells swim towards the ovum. (1 mark)

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- 20.** Controlled amount of water is reabsorbed back into the bloodstream at the distal convoluted tubule by osmosis. Give **two** ways by which this process is enhanced in the human kidneys. (2 marks)

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- 21.** In an experiment, maize grains were soaked in different concentrations of solutions X and Y for 24 hours. The seeds were placed on moist cotton wool in different petri dishes. They were left for ten days after which the percentage germination was determined.

Concentration of Solution x(%)	Germination in set x(%)	Concentration of Solution y(%)	Germination Set y(%)
80	33	80	0
60	52	60	0
40	75	40	12
20	87	20	42
10	97	10	90

- (a) From the table, which of the two chemical substances was most likely to be:-

(i) Gibberellins? (1 mark)

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(ii) Abscisic acid? (1 mark)

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- (b) If a total of 1450 seeds were used in set Y alone. Determine the number of seeds that germinated at the following concentrations for Y (show your working)

(i) 20%

(1 mark)

(ii) 60%

(1 mark)

22. Briefly explain why it would be difficult to calculate the respiratory quotient (R.Q) in living plant cells. (2 marks)

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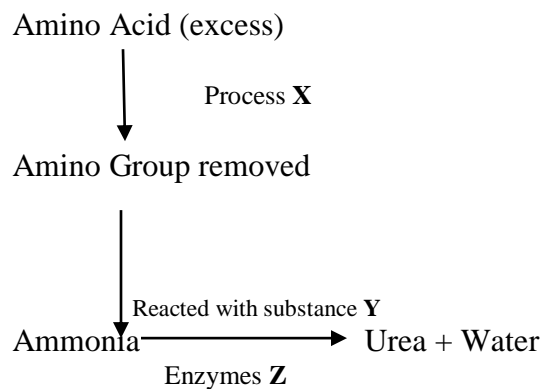
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23. Study the simplified flow diagram below and use it to answer the questions that follow.



Identify and name the following:-

(i) Process **X**. (1 mark)

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(ii) Substance **Y**. (1 mark)

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(iii) Enzyme **Z**. (1 mark)

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24. Name **three** types of cells in a plant leaf which contain chloroplasts. (3 marks)

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25. (a) Apart from thick walls and narrow lumens, state one structural feature common to both the pulmonary artery and the aorta. (1 mark)

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(b) Give two reasons why it is important for the xylem vessels to be dead. (2 marks)

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26. (a) Explain the importance of bile in the process of lipid digestion in humans. (2 marks)

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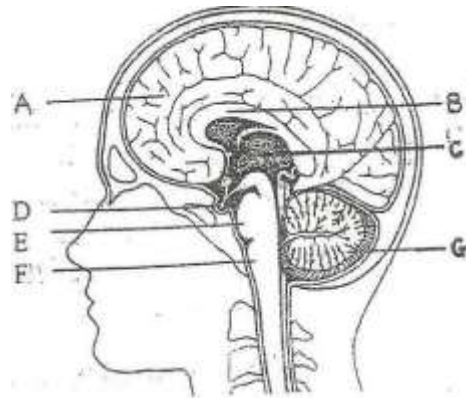
(b) Which enzyme completes the digestion of proteins in the human gut? (1 mark)

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27. An individual of blood group A requires blood transfusion. Give the blood groups of the successful donors. (2 marks)

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28. The diagram below shows the surface view of the human brain. Study and use it to answer the questions that follow.



(a) Identify and name the parts labeled: (2 marks)

A

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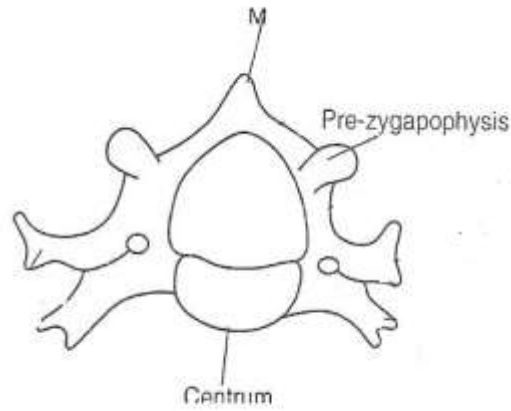
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(b) What would happen if part G was damaged? (2 marks)

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29. The diagram below represents a mammalian bone. Study and use it to answer the questions that follow.



(a) Name the bone. (1 mark)

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(b) Give two observable reasons for your answer in (a) above. (2 marks)

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(c) Identify the part labelled M in the bone. (1 mark)

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30. The diagram below illustrates the behavior of red blood cells when placed into two different solutions X and Y for 30 minutes.



Red Blood cell at
Beginning of experiment

Red blood cell at
The end of experiment

(a) Suggest the nature of solutions represented by the letters X and Y. (2 marks)

X

Y

(b) Name the process represented by the letters A and B. (2 marks)

A.....

B.....

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