

Name.....class.....Adm. No.....

231/1

BIOLOGY

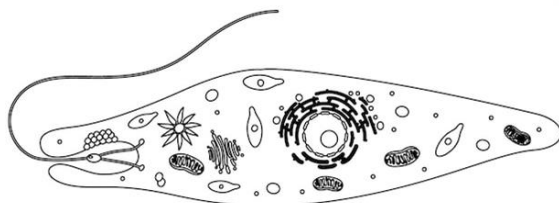
FORM 4

Paper 1

Time: 2 hours

Answer all the questions in the spaces provided.

1. Name any two branches of microbiology. (2marks)
2. Which biological tool would a scientist require to collect rats to be used for study? (1mark)
3. When are two organisms considered to belong to the same species (2marks)
4. The diagram below represents an organism

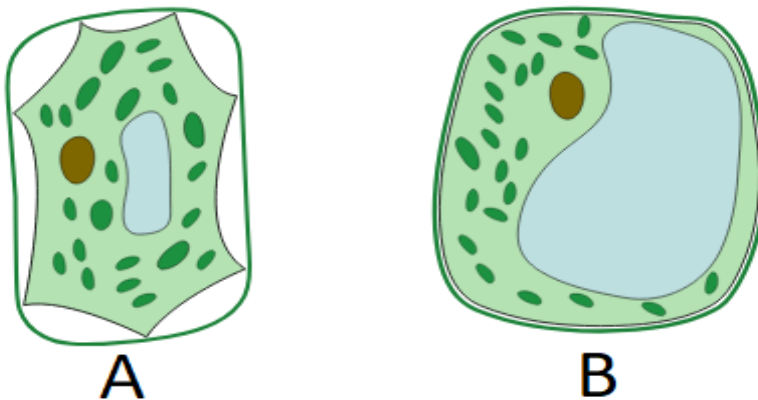


- a) Name the kingdom to which the organism belongs. (1mark)
 - b) Suggest the habitat in which the organism lives. (1mark)
 - c) Give two reasons for your answer. (2marks)
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5. State two unique characteristics of Chordate not found in another Phylum. (2marks)

6. Shieko sec school biology student used a microscope with X40 objective lens and X5 eye piece lens which had 2mm radius. Calculate the area of the field of view in micrometers. (2marks)

b) What is the average size of the cell in micrometers if there were 5 cells on the field of view (2marks)

7. The cells shown below were obtained from two different plant cells which were immersed in 2% and 25% salt solutions



8. (a) Which of the two cells **A** and **B** was immersed in 2% salt solution? (1mark)

(b) Comment on the nature of 25% salt solution in relation to the cell sap. (1mark)

(c) What biological phenomenon leads to the observation made in **A**. (1mark)

9. a) If pepsinogen and trypsinogen were produced in their active forms, what would be their effects on the alimentary canal. (1mark)

- b) How else is the alimentary canal protected from the effects stated in a) above. (1mark)
10. In an investigation, the pancreatic duct of a mice was blocked by tying it with a string. Explain how this affected the digestion of food. (2marks)
11. Examination of the alimentary canal of a mammal showed that the food in the small intestine was more fluid than in the colon. Give an explanation for this observation. (1mark)
12. Name two tissues in plants which are thickened with lignin. (2marks)
13. (a) What is the importance of the following substances in blood clotting process in man?
- (i) Vitamin K. (1mark)
- (ii)Thrombin. (1mark)
- (b) what is the disadvantage of having blood group O. (1mark)
14. Name the part of the seed whose growth brings about epigeal germination. (1mark)
15. a) Differentiate between gaseous exchange and ventilation (1mark)

b) State the respiratory site of the following. (2marks)

i) Fish -

ii) Insect -

16. In an investigation, a bird was found to use 10 litres of oxygen to give a respiratory quotient of 0.7 during period of flight.

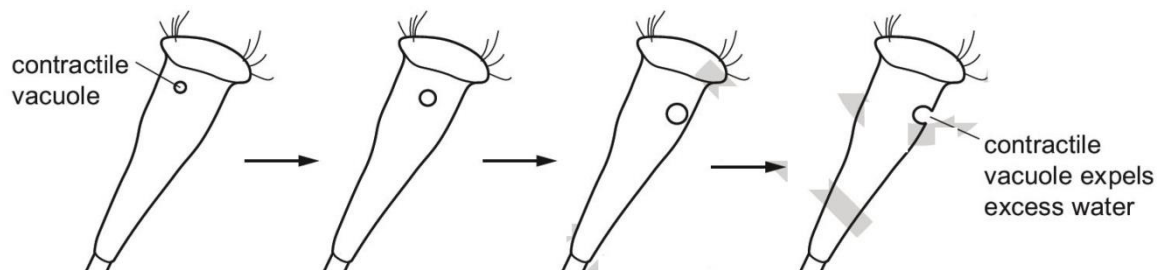
a) Name the type of food that was being respired by the bird. (1mark)

b) Determine the volume of carbon (IV) oxide produced during the same flight. (2 marks)

17. a) Single-celled Organisms with cell walls do not have contractile vacuoles. Suggest why.

(2marks)

b) *Rhabdostyla* lives in freshwater habitats, such as pond, lakes and rivers where solute concentration is low. *Rhabdostyla* has a contractile vacuole that fills with water and empties at intervals as shown in. The contractile vacuole removes excess water.



Explain, why *Rhabdostyla* needs to remove excess water.

(3marks)

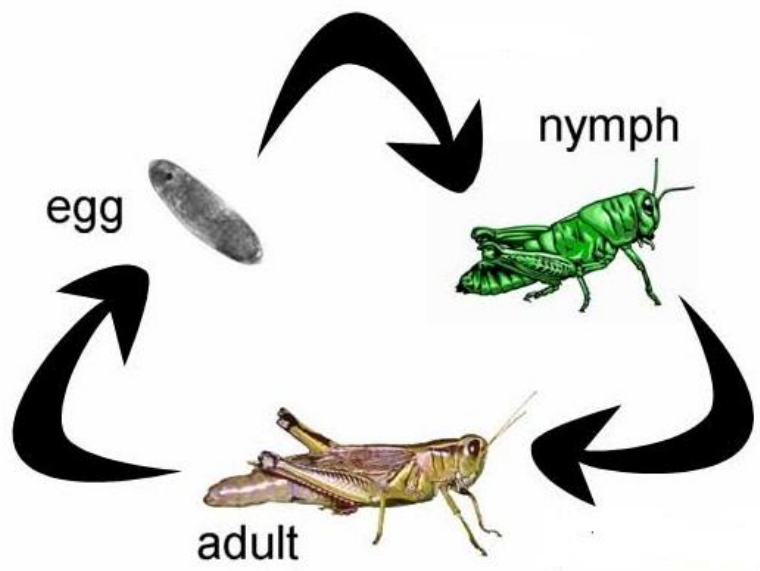
18. Name three plant excretory products deposited in the leaf. (3marks)

19. State one economic importance of each of the following plant excretory products. (2marks)

(a) Tannin

(b) Quinine

20. Study the life cycle shown below and answer the questions that follow.



a) i) Identify the life cycle shown above. (1mk)

ii) Give a reason for your answer in ai) above. (1mk)

b) Explain how the prothoracic gland is important in the life cycle above. (2mks)

- c) Name one stage found in the cycle of butterfly but is missing in the above cycle. (1mk)
21. Name the structures in the human body that detect: (2marks)
- (i) External temperature changes.
 - (ii) Internal temperature changes.
22. (a) Name the hormone whose deficiency may lead to the excretion of glucose in urine. (1mark)
- (b) Name the hormone that controls the reabsorption of sodium ions in the kidney tubules. (1mark)
23. Oil can be applied on stagnant water to control the spread of Malaria;
- a) How does this practice control the spread of Malaria (1mark)
 - b) Give a reason why this practice should be discouraged (2marks)
24. a) State two importance of predation in an ecosystem. (2marks)
- b) Apart from predation state two other biotic factors that will influence the distribution of organisms in an ecosystem. (2marks)

25. Mention two causes of genetic variation. (2marks)
26. State two importances of polyploidy. (2marks)

27. a) Pure lines of black and white mice were crossed. All the F1 generation were grey. Explain the absence of white and black mice in the F1 generation. (1mark)

b) Define multiple alleles (1mark)

28. a). State two theories that explains origin of life (2marks)

b) State three evidences of organic evolution (3marks)

29. a) Explain two limitations of fossil records as evidence of organic evolution. (2marks)

b) Name the evidence of organic evolution exhibited by occurrence of similar amino acid molecules in a range of organism. (1mark)

30. State the function of the following parts of the eye. (2marks)
Ciliary body –

Sclerotic layer –

31. State three ways through which herbaceous stem obtain support. (3marks)