UNEB U.C.E PAPER 1 BIOLOGY 2005

THEORY : SECTION A

Answers to this section must be written in the boxes provided.

1. Which one of the following organisms improves aeration and drainage of soil?

A. Fungi

B. Snails

C. Bacteria

D. Termites

2. Which one of the following groups contains the largest number of organisms?

A. Order

B. Species

C. Class

D. Phylum

3. People living at high altitudes have more red blood cells than those at lower altitudes in order to

A. Breathe more quickly.

B. Keep the body warm.

C. Pump more blood.

D. Absorb enough oxygen.

4. Which one of the following best describes the effect of one-idea illumination on the distribution of auxin in a shoot tip?

A. The auxins are evenly distributed around the tip.

B. The light inhibits movement of auxin down the tip.

C. There is a reduction of auxin on the illuminated side of the tip.

D. The auxin increase on the illuminated side of the tip.

5. The group of organs performing excretory functions is

A. Kidneys, lungs and skin.

B. Liver, kidneys and pancreas.

C. Skin, kidneys and pancreas.

D. Lungs, spleen and gall bladder.

6. A cuticle may be regarded as a disadvantage to insects mainly because

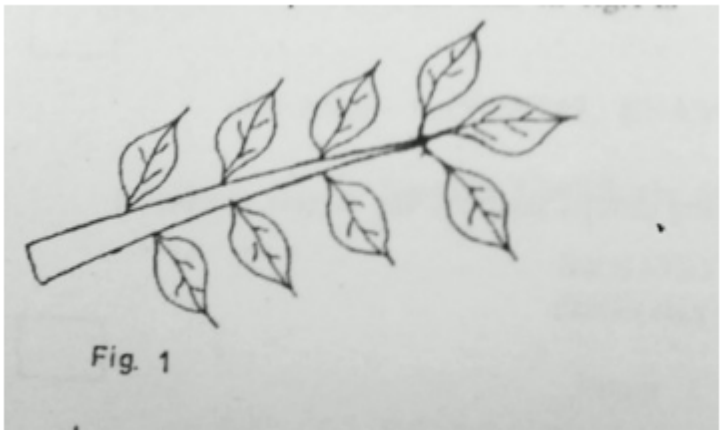
A. It does not allow rapid locomotion.

B. It limits the size of insects.

C. Does not prevent water loss.

D. Does not allow gaseous exchange.

7. The best description of the leaf in fig. 1 is



A. Pinnate and parallel veined.

B. Palmate and net veined.

C. Pinnate and net veined.

D. Bipinnate and parallel veined.

8. Which one of the following structures of the ear equalizes pressure on both sides of the eardrum?

A. Oral window.

B. Eustachian tube

C. Semi circular canal

D. Round window

9. Which one of the following shows the correct followed by the sperm when ejaculated?

A. Somniferous tubules - epididymis - sperm duct - urethra.

B. Epididymis - somniferous tubules - urethra - sperm ducts.

C. Sperm ducts - somniferous tubules - edidymis - urethra.

D. Somniferous tubules - urethra - sperm ducts - epididymis.

10. Stunted growth and mental retardation in children may be due to

A. Under production of pituitary hormone.

B. Under production of insulin.

C. Deficiency of thyroxin hormone.

D. Deficiency in adrenaline hormone.

11. Which of the following monosaccharide's make up sucrose?

A. Galactose and fructose.

B. Galactose and glucose.

C. Fructose and glucose.

D. Two glucose molecules.

12. Which of the following parts of a microscope are adjusted in order to bring the specimen into focus?

A. Eyepiece and coarse adjustment.

B. Coarse and line adjustments.

C. Eyepiece and fine adjustment.

D. Mirror and fine adjustment.

13. P, Q, R and S are characteristics of insects.

P - undergo complete metamorphosis.

Q - possess wings.

R - have three pairs of legs.

S - divided into three body parts.

Which of them are common to all insect?

A. **P** and **Q**

B. **R** and **S**

C. **Q** and **S**

D. **P** and **R**

14. Which of the following is not a characteristic of a respiratory surface?

A. Thin walls.

B. Moist surface.

C. Densely supplied with capillaries.

D. Smooth surface.

15. Green plants give out less carbon dioxide during day than at night because during the day

A. The rate of photosynthesis is low.

B. Transpiration interferes with escape of carbon dioxide.

C. Most stomata close

D. Some of the carbon dioxide produced is used for photosynthesis.

16. Is comparison with the blood flowing through the vena cava, the blood flowing through the aorta has.

A. Less carbon dioxide, oxygen and higher pressure.

B. More oxygen, more carbon dioxide and lower pressure.

C. Less carbon dioxide, less oxygen and lower pressure.

D. More carbon dioxide, less oxygen and higher pressure.

17. Which of the following organs contain glands which are part of the endocrine system?

A. Liver, pancreas, heart.

B. Brain, pancreas, ovary.

C. Brain, testes, heart.

D. Kidney, heart, liver.

18. Oxygen debt occurs during active physical exercise in mammals because

A. Alcohol accumulates in the body.

B. Of anaerobic respiration that occurs.

C. Of high rate of breathing during exercise.

D. Carbon dioxide produced accumulates during the exercise.

19. Which one of the following explains why a rat loses heat more rapidly to the surroundings than an elephant?

A. A rat has smaller ears than an elephant.

B. A rat has a higher metabolic rate than an elephant.

C. Surface area: volume ratio of a rat is higher than that of an elephant.

D. A rat has fewer hairs than an elephant.

20. Which one of the following is responsible for a decrease in dry weight of a seed during germination?

A. The seed loses more water than it absorbs.

B. Soluble food materials are converted to starch.

C. Stored food is used up.

D. Soluble food materials are lost the soil.

21. Which one of the following is not affected by environmental factors?

A. Height

B. Skin color

C. Albinism

D. Intelligence

22. Which one of the following would occur if the number of predatory bugs was increased in the food chain below?

Plants - Caterpillars - Predatory bugs - Birds.

A. Decrease in number of birds.

B. Increase in number of plants.

C. Increase in number of caterpillars.

D. Decrease in number of plants.

23. Which one of the following structures of a flower develops into a seed coat after fertilization?

A. Embryo sac

B. Integuments

C. Receptacle

D. Ovary

24. Which one of the following would happen to plasmolysed cells of a plant tissue that has been placed in water for some time?

A. Their cell vacuoles would shrink.

B. They would not experience any change in size.

C. They would increase in volume.

D. They would become shorter.

25. Which one of the following is part of the axial skeleton?

A. Humerus

B. Femur

C. Thoracic vertebra

D. Ulna

26. When homozygous red-flowered plants were crossed with homozygous white flowered plants, all plants produced had pink flowers. What pink flowered plants?

A. 3 red -flowered: 1 white -flowered.

B. 1 red-flowered: 3 white-flowered.

C. 1 red-flowered: 2 pink-flowered plant, 1 white-flowered.

D. 2 red-flowered: 1 pink-flowered plant, 1 white-flowered.

27. When milk is the main food in the diet of a child, it should be supplemented with food rich in

A. Iron

B. Calcium

C. Sugar

D. Vitamin D

28. In which of the following are the largest amounts of nitrogenous wastes excreted?

A. Urine

B. Sweat

C. Breath

D. Feaces

29. Which of the following describes internal respiration?

A. Breathing in and releasing of oxygen into the tissues.

B. Getting rid of carbon dioxide accumulated in the tissue.

C. Building up of complex substances.

D. Oxidation of food substances to release energy.

30. Which one of the following is the least important function of humus in the soil?

A. Improving soil aeration.

B. Prevention of soil erosion

C. Water retention.

D. Increasing soil fertility.

SECTION B

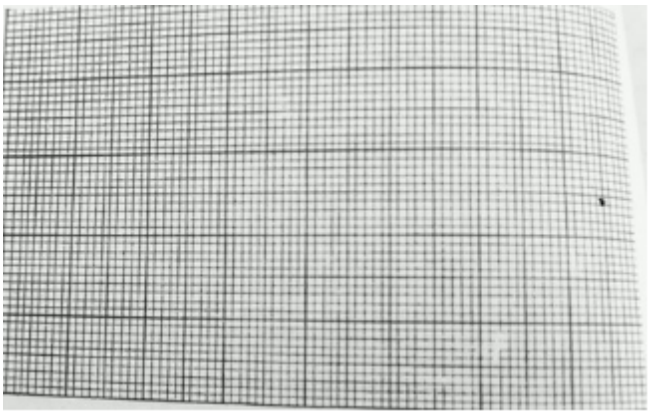
Answer all questions in this section. Answer must be written in the spaces provided.

31. Six identical potato cylinders measuring 2.0 cm in length were each placed in a different concentration of sugar solution. After two hours, the potato cylinders were removed from the solutions and remeasured. The table below shows the results.

Concentrations of sugar solutions mol I^{-1}	**length of potato cylinders after 2 hours (cm).**	**Difference in length of potato cylinders after 2 hrs (cm).**
0.1	2.40	
0.2	2.25	
0.3	2.15	
0.4	2.05	
0.5	1.98	
0.6	1.02	

a) Complete the table by filling in the difference in length of each potato cylinder after two hours (i.e. length after 2 hours subtract initial length)

b) In the space provided plot a graph of the difference in length after 2 hours against concentration of sugar solutions.



c) (i) What was the effect of the concentration of the sugar solutions on the length of the potato cylinders?

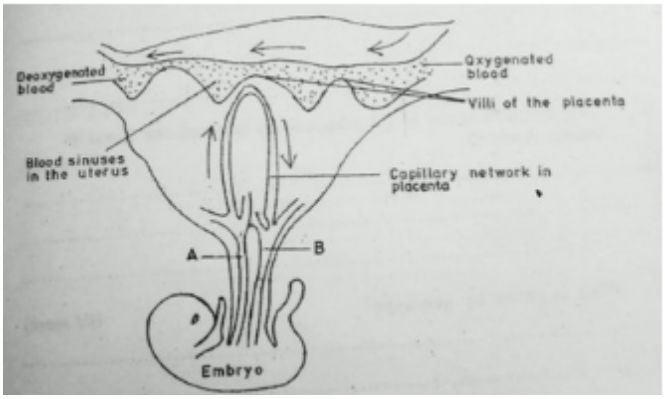
(ii)Explain why the concentration of the sugar solutions affected the length of the potato cylinders as stated in (c)(i).

d) (i) From your graph, determine the concentration of the sugar solution that would give no difference in length of a potato cylinder.

(ii)Explain what happens in a potato cylinder when no change in length occurs.

e) Suggest one other observation other than change in size that would be made on the potato cylinders.

32. **Fig.2** shows the relationship between blood supply of the embryo, placenta and uterus.



a) State the functions of the:

(i) Placenta to the embryo.

(ii) Villi on the placenta.

b) Give two reasons why the mother's blood does not mix with that of the embryo.

c) Give two differences in the composition between the blood in vessels **A** and **B**.

33. a) What is meant by **genotype**?

b) In a man blood group **A** married a woman homozygous for blood group **B** and they produced a son of blood group **B**.

(i) Work out the genotypes of the father and of the son.

(ii) The son married a wife of blood group **O**. showing your working, give the percentages of the possible phenotypes of their offspring.

c) Blood groups in humans show **discontinuous variation.** Explain what you understand by this statement.

SECTION C

Answer any two questions.

34. a) What are the constituents of fertile soil?

b) In what ways human activities.

(i) Improve soil?

(ii) Degrade soil?

35. a) Describe the structure of the different types of a bird's feathers, stating the function of each type.

b) What factors contribute to the bird's ability to fly?

36. a) Draw and label a transverse section of a stem of a herbaceous dicotyledonous plant.

b) State the function of five of the parts that can be identified in the section.

c) Describe how stems are modified to perform other functions other than conducting materials within the plant.

37. a) What is meant by excretion?

b) Describe how carbon dioxide is removed from the mammalian body tissues into the atmosphere.