Time: 2hrs

SECTION A

1. Which one of the following is a property of sandy soil?

A. Low capillarity.

B. High nutrient content.

C. Good water retention.

D. Poor aeration

2. A student made a drawing of a cockroach. The length of the drawing was 5 cm and the actual length of the cockroach was 2.5 cm. What is the magnification of the drawing?

A. x 12.5

B. x 7.5

C. x 2.0

D. x 0.5

3. During the pupal stage in the life cycle of an insect, there is

A. rapid cell division.

B. much food consumption.

C. a lot of air intake.

D. tissue re-organization.

4. The correct difference between complete and incomplete metamorphosis is

Complete metamorphosis	Incomplete metamorphosis
A. Young and adult have same feeding habits	Young and adult have different feeding habits.
B. Young and adult are different	Young and adult look alike.
C. Involves four stages	Involves two stages
D. Dormant stage is the egg.	Dormant stage is the pupa

5. Which one of the following cells does not carry out photosynthesis?

A. Guard cells.

B. Spongy cells.

C. Palisade cells.

D. Epidermal cells.

6. Which one of the following parts of a flower produces gametes?

A. Stigma.

B. Anther.

C. Filament.

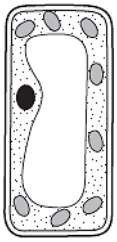
D. Corolla.

7. The diagram below shows three different cells, not drawn to the same scale.

1 2 3

Which are animal cells?
A. 1 and 2 only
B. 1 and 3 only
C. 2 and 3 only
D. 1, 2 and 3

8. The diagram shows a plant cell.

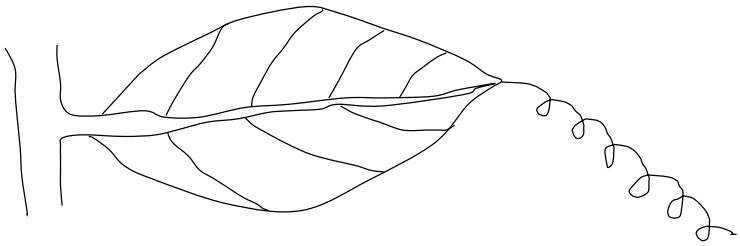


Which structure identifies this as a plant cell rather than an animal cell?
A. cell membrane
B. cell wall
C. cytoplasm
D. nucleus

9. The diagram shows an animal whose scientific name is *Rattus rattus*.

Which genus does it belong to?
A mammal
B *rattus*
C *Rattus*
D vertebrate

10. The leaf in the figure below is for?



A. Reproduction

B. Photosynthesis

C. Water storage

D. Support.

11. The larva of a housefly moults a number of times before it pupates ii order to

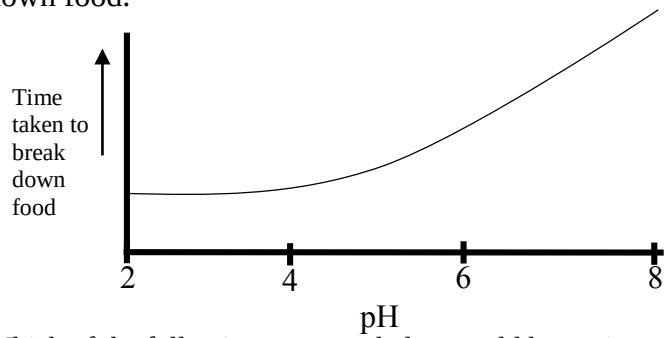
A. breathe more easily.

B. pass out waste products.

C. increase in size.

D. move faster.

12. The graph below shows the effect of varying pH on the time taken for an enzyme to break down food.



Which of the following enzymes below could have given that response?

A. Pepsin.

B. Lipase.

C. Salivary amylase.

D. Trypsin.

13. Which one of the following pairs of nutrients consists of disaccharides only?

A. Glucose and galactose.

B. Maltose and lactose.

C. Fructose and sucrose.

D. Sucrose and glucose.

14. In plants, efficient gaseous exchange due to large surface area to volume ratio is achieved by

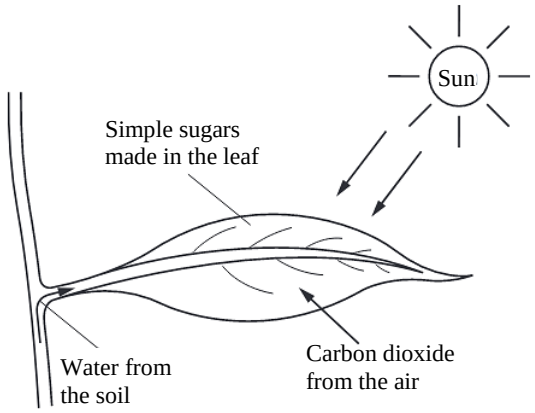
A. many stomata on leaves.

B. flatness of leaves.

C. large sized lenticels.

D. numerous root hairs.

15. The diagram below shows a leaf on a plant.



Which characteristic of life is represented by this diagram?

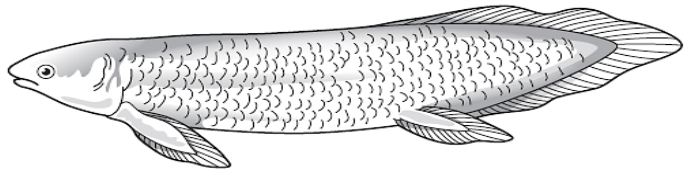
A. excretion

B. nutrition

C. respiration

D. sensitivity

16. The diagram shows the external features of an animal.



To which class does it belong?

A. amphibians

B. fish

C. mammals

D. reptiles

17. The diagram shows an animal whose scientific name is *Falco peregrinus*.

To which species does it belong?

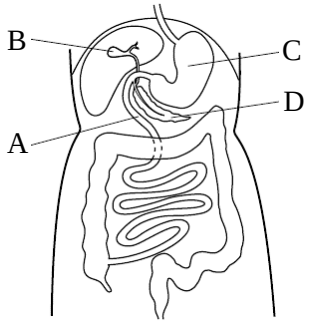
A. bird

B. *F. peregrinus*

C. *Falco*

D. vertebrate

18. The diagram shows part of the human digestive system. Where is protein digested by trypsin?



19. What would happen to an enzyme if the temperature of the medium was increased to above 50^0C?

A. Killed.

B. Activated.

C. Denatured.

D. Inactivated.

20. The following are body secretions.

(i) Amylase

(ii) Trypsin

(iii) Hydrochloric acid

(iv) Pepsin

(v) Rennin

Which of them are contained in pancreatic juice?

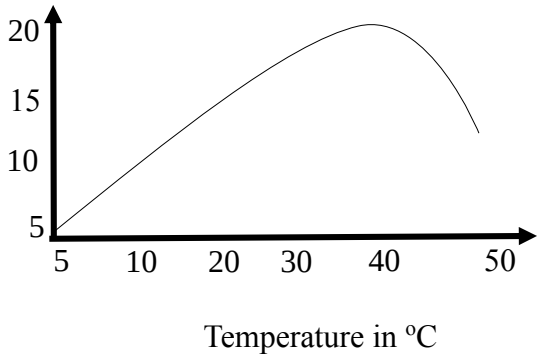
A. (i) and (iii).

B. (ii) and (iv).

C. (iii) and (iv).

D. (i) and (ii).

21. The graph below shows the volume of gas produced during photosynthesis.



What is the possible reason for the fall in volume of gas after 40^0C?

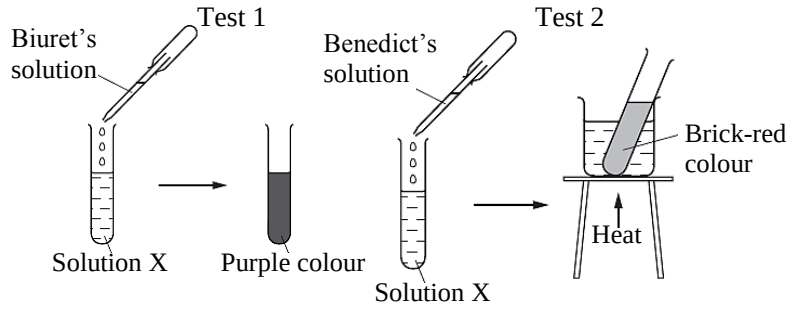
A. There was no more oxygen in the atmosphere.

B. Enzymes were denatured.

C. Starch was converted to sugar.

D. There was too much sunlight.

22. The diagram below shows two food tests carried out on solution X.



Which nutrients are present in solution X?

A. protein and starch

B. protein and sugar

C. starch and fat

D. starch and sugar

23. Which one of the following organisms improve aeration and drainage of soil?

A. Fungi.

B. Snails.

C. Bacteria.

D. Termites.

24. A student heated strongly a dry sample of soil to a constant mass. The loss of mass in the soil is due to

A. Loss of mineral salts.

B. Loss of water.

C. Escape of air.

D. Destruction of humus.

25. Which one of the following is an effect of deforestation?

A. More oxygen accumulates in the atmosphere.

B. More plant nutrients are retained in the soil.

C. Formation of soil occurs rapidly.

D. More carbon dioxide accumulates in the atmosphere.

26. Which one of the following farming practices does not promote soil fertility?

A. Strip cropping.

B. Crop rotation.

C. Monoculture.

D. Mulching.

27. Which one of the following enzymes acts best at low pH?

A. Pepsin.

B. Peptidase.

C. Trypsin

D. Lipase.

28. The opening of stomata during night and closure during day is an attempt to

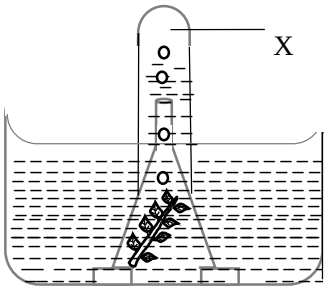
A. stop gaseous exchange.

B. conserve water.

C. conserve energy.

D. lower the temperature.

29. The illustration below is an experimental set up to demonstrate photosynthesis.



Gas X produced in the experiment is tested by the use of

A. Lighted splint.

B. Lime water.

C. Litmus paper.

D. Sodium bicarbonate.

30. Four test tubes, each with contents as indicated in the following table were incubated at a temperature In which test tube did the contents become clear?

A. 4

B. 3

C. 2

D. 1

Test tube	Contents
1	Albumen + pepsin
2	Albumen + dilute hydrochloric acid
3	Albumen + pepsin + dilute hydrochloric acid
4	Albumen + boiled pepsin + dilute hydrochloric acid

In which test tube did the contents become clear?

A. 4

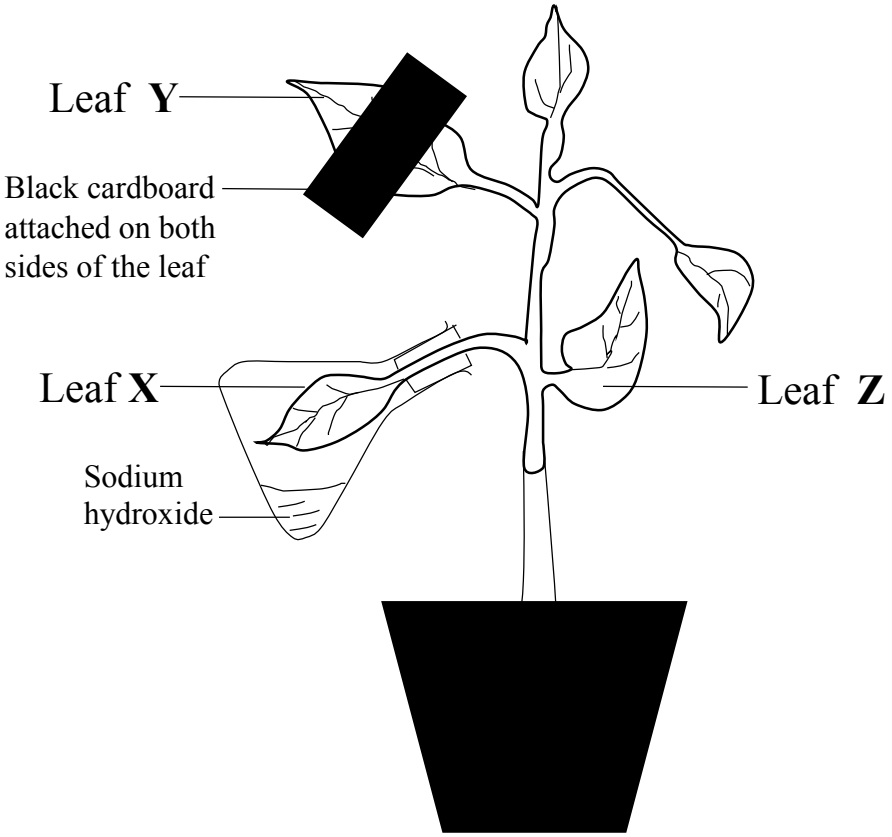
B. 3

C. 2

D. 1

SECTION B

31. During an investigation, a well-watered potted plant was kept in darkness for 24 hours. After that, three of its leaves were marked X, Y, Z and then treated as shown in the illustration below.



The whole set up was then exposed to sunlight for about 6 hours and the 3 leaves were tested for starch.

(a) What was the purpose of keeping the potted plant in darkness for 24 hours? Explain your answer.

Purpose (2)

Explanation (3 marks)

(b) (i) What was being investigated in leaves marked X and Y? (4 marks)

X.----------

Y----------

(ii) Why was leaf Z considered as a control in this experiment? (4 marks)

(c) State what was observed when leaf Y was tested for starch. (3 marks)

(d) (c) State what would be observed if leaf X had water instead of sodium hydroxide was tested for starch. (4 marks)

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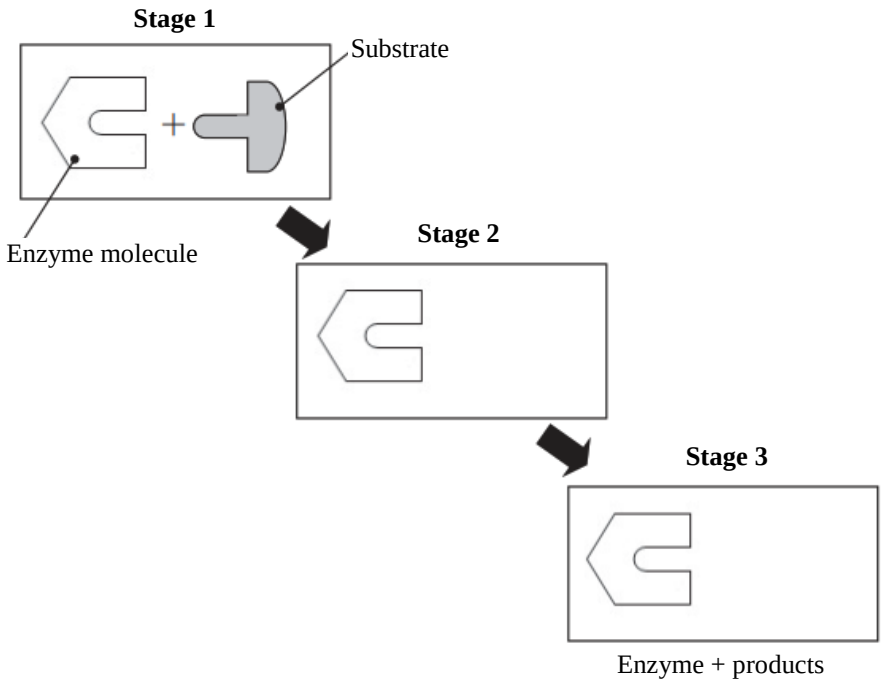
32. The diagram below shows a model of how an enzyme molecule acts on a substrate.



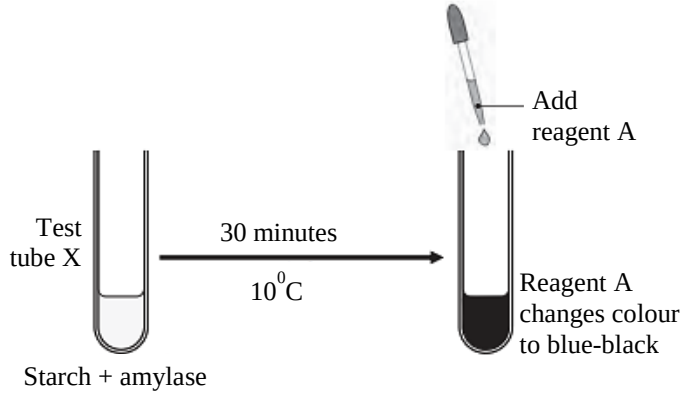
(a) (i) Name this model. (1 mark)

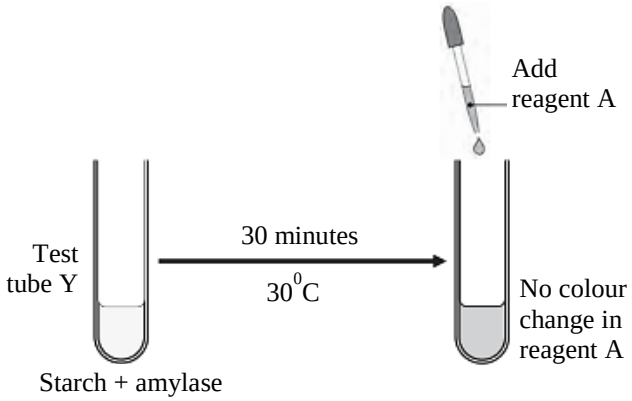
(ii) Complete Stage 2 and Stage 3 of this model exactly on the diagram. (2 marks)

A cell contains only a small amount of this enzyme, yet each enzyme molecule is able to act on thousands of substrate molecules in a minute.

(iii) Explain what happens to this enzyme molecule, after Stage 3, to allow it to act on thousands of substrate molecules. (2 markS)

(b) The diagram shows an experiment on the action of the enzyme amylase.





Look at the diagram.

(a) Name reagent A. (1 mark)

(b) Which factor was being performed in this experiment? (2 marks)

(c) Explain why there is no colour change in tube B. (2 marks)

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33. Define the following terms as used in nutrition

(a) Photosynthesis (3 marks)

(b) Chemosynthesis (2 marks)

(c) Nutrition (2 marks)

Organic nutrition (3 marks)

SECTION C

Attempt all numbers on this page

34. (a) Describe the activities of digestion which occur in each of the following parts of the alimentary canal.

(i) Stomach (4 marks)

(ii) Ileum (4 marks)

(b) How is the ileum adapted to food absorption? (7 marks)

35. (a) Compare insects and arachnids, using structural features (6 marks)

(b) State the economic importance of insects. (9 marks)

FROM PROFESSOR GIDEON ALEXANDER WISHING YOU THE BEST HOLIDAY, MERRIEST CHRISTMAS, HAPPIER NEW YEAR AND ABOVE ALL STAY SAFE