Revision Paper 3

For each question, choose the most suitable option and write the letter (**A**, **B**, **C** or **D**) in the brackets provided.

1. The greatest number of chloroplasts are found in the _____ of a leaf.

   A cuticle

   B epidermis

   C spongy mesophyll

   D palisade mesophyll ( )

2. Carbon dioxide dissolves in water to form a weak acid. When fully submerged aquatic plants carry out photosynthesis, the pH level of the water changes.

   What is the change in the pH and when does this happen?

	Change in pH	Time of Day
A	Decrease	At 06 00
B	Decrease	At 12 00
C	Increase	At 06 00
D	Increase	At 12 00

( )

3. Figure 1 shows how the rate of photosynthesis in three similar plants may vary with carbon dioxide concentration and temperature as light intensity increases.

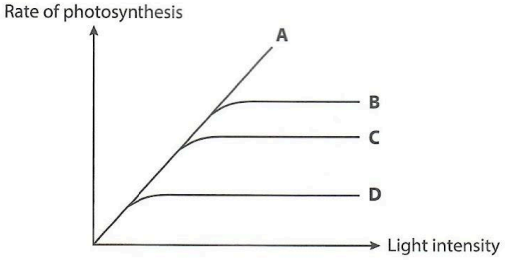


Figure 1

Which graph, **A**, **B**, **C** or **D**, represents the rate of photosynthesis in the plant exposed to the lowest carbon dioxide concentration and temperature? ( )

4. Figure 2 shows an experimental set-up to measure the rate of photosynthesis.

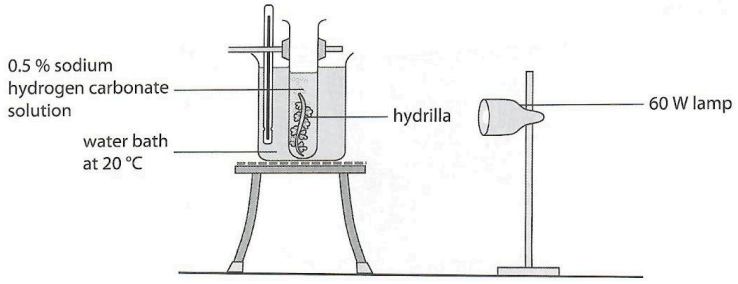


Figure 2

Suggest how the rate of photosynthesis may be decreased without moving the lamp.

A Use a water bath at 8 °C.

B Use a water bath at 36 °C.

C Use an 80 W bulb for the lamp.

D Use 1 % sodium hydrogen carbonate solution. ( )

Use the information below to answer questions **5** and **6**.

Plants utilise starch, which is large and insoluble in water as a storage molecule. Starch consists of amylose, a linear and unbranched polymer, and amylopectin, which is highly branched.

5. Sweet Grain, a genetically engineered variant of rice, is characterised by a particularly high concentration of amylose. Thus, it can be inferred that the synthesis of starch in Sweet Grain involves _____.

A the breaking of the bonds within amylopectin

B the shortening of every branch of amylopectin

C controlling the branching pattern of amylopectin

D the removal of all the branches from amylopectin to form amylose ( )

6. The seeds of Sweet Grain do not differ in size and appearance from those of wild rice. Upon drying, however, the seeds of Sweet Grain shrink and wrinkle.

This suggests that the seeds of Sweet Grain contain _____ compared to the seeds of wild rice.

A less starch and less water

B less starch and more water

C more starch and less water

D more starch and more water ( )

Figure 3 shows a cross-section of a leaf of a certain plant. Use the diagram to answer questions **7** and **8**.

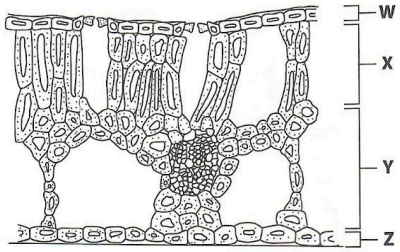


Figure 3

7. Cuticle can be found in _____.

   A layer **Z** only
   B layer **W** only
   C layers **W** and **Z** only
   D layers **W**, **Y** and **Z** only ( )

8. The guard cells in the leaf are found only in the upper epidermis. What is a possible reason for this?

   A Water can enter the plant through the leaf.
   B Gaseous exchange can occur more quickly.
   C They help to increase the transpiration pull.
   D It is a water plant and the leaf floats on water. ( )

9. Which of the following facilitates the rapid flow of sucrose through the sieve tube elements?

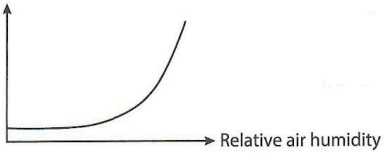
   A The thin walls of companion cells
   B The presence of pores in the sieve plates
   C The presence of mitochondria in the companion cells
   D The presence of cytoplasm lining the walls of the sieve tube elements ( )

10. _____ helps water to move up a xylem vessel.

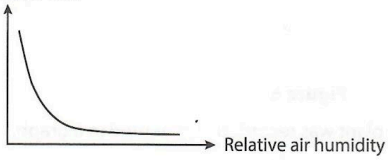
    A Adhesion
    B Translocation
    C Capillary action
    D Surface tension ( )

11. Which of the following graphs **correctly** shows how transpiration rate in plants varies with relative air humidity?

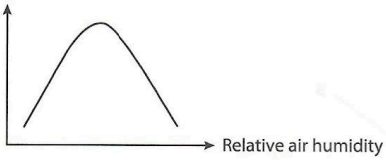
A



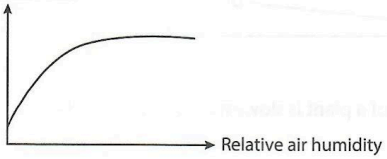
B



C



D



( )

12. Figure 4 shows part of a structure responsible for transporting substances in a flowering plant.

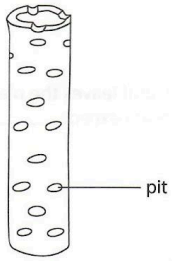


Figure 4

Identify one way in which the structure is adapted for its function.

A It has mitochondria.

B It has numerous pits.

C It has a hollow lumen.

D It has companion cells. ( )

13. Figure 5 shows an experimental set-up where a plant was placed in a potometer outdoors from 6 a.m. to 6 p.m. Both surfaces of all the leaves had been covered with petroleum jelly.

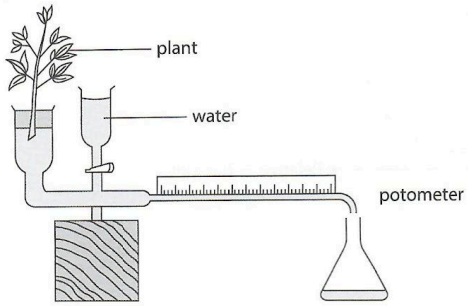
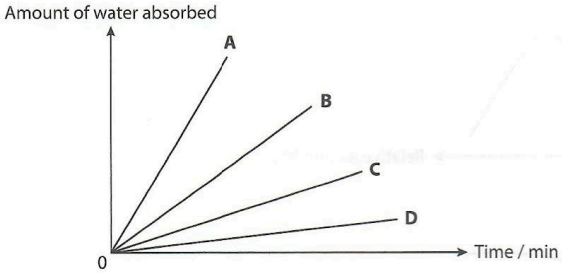


Figure 5

The amount of water absorbed by the plant was recorded and plotted in a graph.

Which graph, **A**, **B**, **C** or **D**, represents the results obtained?



( )

14. Movement of water through the stem of a plant is slowest on a _____ day.

A hot and windy

B hot and humid

C cold and windy

D cold and humid ( )

15. A water molecule enters a root hair cell and leaves the plant through a stoma. On the way, it must pass through all the following parts except _____.

A the lumen of a xylem vessel

B the vacuole of the root hair cell

C the guard cells of the epidermis

D the spongy mesophyll tissue of a leaf ( )

Figure 6 shows the movement of water in a flowering plant. Use the diagram to answer questions **16** and **17**.

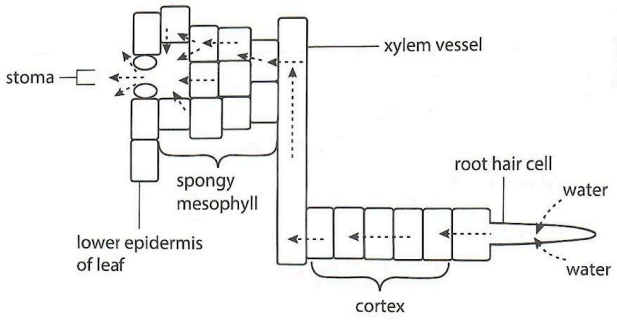


Figure 6

16. Which of the following processes is responsible for the movement of water through the xylem vessel?

A Osmosis
B Diffusion
C Transpiration
D Translocation ( )

17. Water moves out of a stoma by _____.

A osmosis
B diffusion
C transpiration
D translocation ( )

18. A plant is provided with carbon dioxide containing radioactive carbon ^{14}C in the daytime. An hour later, the stem is cut. Figure 7 shows the transverse section of the stem.

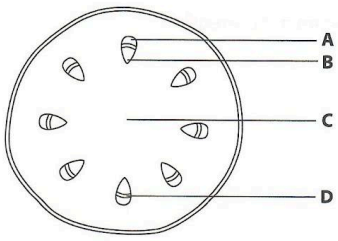


Figure 7

An x-ray film is placed over the cut stem. Which part, **A**, **B**, **C** or **D**, will cause the film to darken? ( )

19. Figure 8 shows a food chain in a field community.

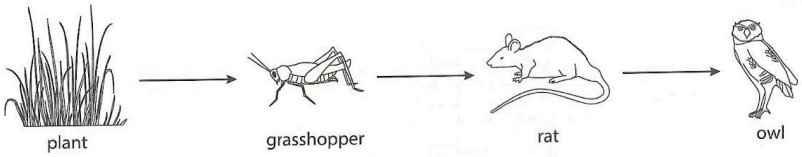


Figure 8

The secondary consumer is the _____.

A rat
B owl
C plant
D grasshopper ( )

20. _____ results in the conversion of carbon from an inorganic form to an organic form.

A Respiration
B Combustion
C Decomposition
D Photosynthesis ( )

21. Figure 9 shows an ecological pyramid.

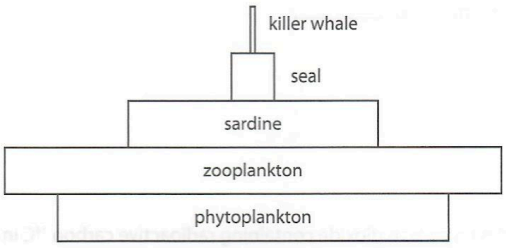


Figure 9

What does this ecological pyramid represent?

A Energy
B Biomass
C Surface area
D Physical size ( )

O 22. Figure 10 shows the carbon cycle.

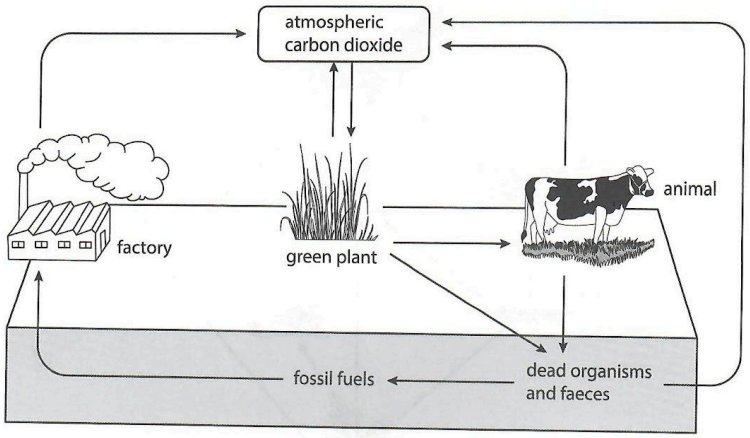


Figure 10

Identify the two processes by which carbon is transferred from one organism to another.

A Feeding and decomposition

B Feeding and photosynthesis

C Respiration and decomposition

D Decomposition and photosynthesis ( )

O 23. Figure 11 shows the pyramid of energy of a food chain.

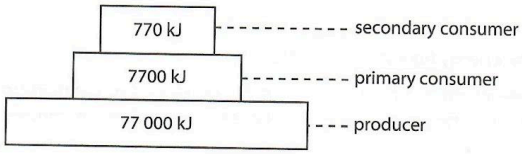


Figure 11

How much energy is transferred through each trophic level?

A 1 %

B 10 %

C 90 %

D 99 % ( )

24. Figure 12 shows a food web in a woodland reserve.

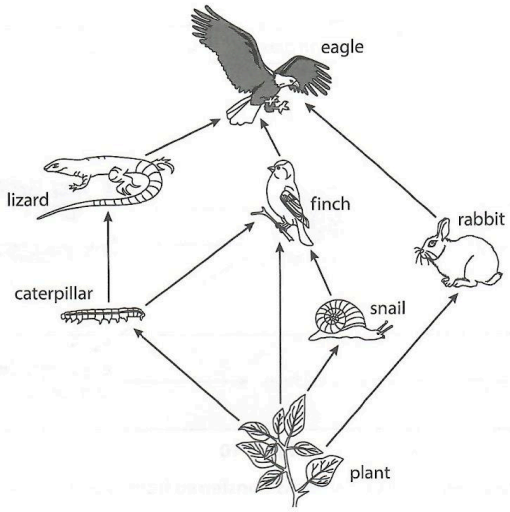


Figure 12

Which organism is both a prey and a predator?

A Finch

B Eagle

C Rabbit

D Caterpillar ( )

25. Figure 13 shows the energy flow in an ecosystem.

Which arrow represents the least amount of energy transferred to the next trophic level?
Which arrow represents the greatest amount of energy lost to the environment?

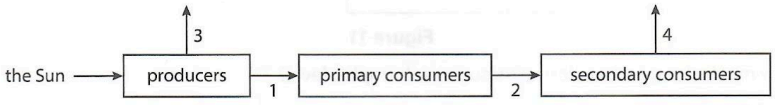


Figure 13

	Least Energy Transferred	Most Energy Lost
A	1	3
B	1	4
C	2	3
D	2	4

( )

O 26. Decomposers are organisms that _____.

A rely on other organisms for food and shelter

B feed on and obtain energy from other organisms

C absorb and convert light energy into simple sugars

D break down dead organic matter into simpler nutrients ( )

O 27. Which of the following demonstrates the transfer of carbon compounds from producers?

A Herbivores feeding on and digesting plant material

B Dead organisms breaking down into simpler nutrients

C Green plants converting light energy into chemical energy

D Fossil fuels being burnt in power plants to produce electricity ( )

O 28. Figure 14 shows the energy and nutrient pathways in an ecosystem.

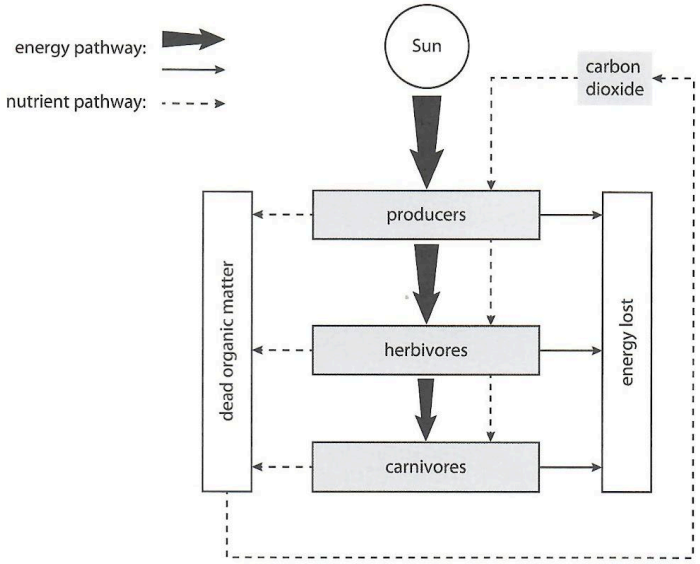


Figure 14

Which substance is represented by the nutrient pathway?

A Nitrate

B Carbon

C Oxygen

D Glucose ( )

O 29. _____ are the organisms found at the bottom of every food chain.

A Producers
B Carnivores
C Herbivores
D Omnivores ( )

O 30. Which of the following is **not** a possible effect of timber logging?

A Flooding
B Algal bloom
C Desertification
D Global warming ( )