Multiple choice questions
Each of Questions **1** to **30** is followed by four responses, **A**, **B**, **C** and **D**.
For each question select the *best* response and mark its letter on the answer sheet.

1 Which one of the following microscope preparations of a root of a bean seedling would most clearly show the sequence of development of its tissues?

A transverse section through the root hair region
B longitudinal section of the terminal 10 mm
C squash preparation of the terminal 3 mm
D teased out macerated tissue of the terminal 1 mm

2 The table shows pressures in the left atrium, left ventricle and aorta at different stages during a single cardiac cycle in a mammal.

Stage	Pressure in kPa		
	Left atrium	Left ventricle	Aorta
1	0.5	0.4	10.6
2	1.2	0.7	10.6
3	0.3	6.7	10.6
4	0.4	17.3	16.0
5	0.8	8.0	12.0

Which one of the following statements is supported by the data?

A The atrioventricular (bicuspid) and aortic valves are closed during Stage 2.
B The atrioventricular (bicuspid) valve is closed and the aortic valve is open during Stage 4.
C The atrioventricular (bicuspid) valve is open during Stage 3.
D The aortic valve is open during Stage 5.

3 Some liver tissue was homogenised. Which one of the following treatments would result in the greatest rate of production of carbon dioxide?

A Incubate the whole homogenate with glucose in an atmosphere of nitrogen.
B Isolate the mitochondria from the homogenate and incubate them with glucose in an atmosphere of oxygen.
C Incubate the whole homogenate with pyruvate in an atmosphere of nitrogen.
D Isolate the mitochondria from the homogenate and incubate them with pyruvate in an atmosphere of oxygen.

4 During the first steps of glycolysis, ATP is used to

A break down the hexose sugar directly.
B activate enzymes that break down the hexose sugar.
C phosphorylate the hexose sugar, making it more likely to react.
D make the breakdown of the hexose sugar more likely by increasing the activation energy of the reaction.

5 Which one of the following would be *least* likely to encourage the conversion of glycogen to glucose?

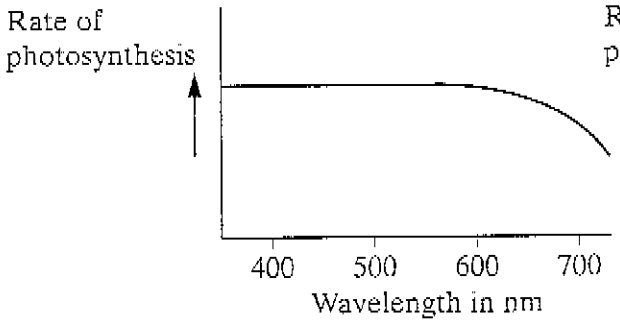
A the release of a substance which inhibits insulin
B a drop in blood glucose level
C increased absorption of monosaccharides from the gut
D the secretion of adrenaline from the adrenal medulla

6 Enzymes which hydrolyse disaccharides are found in the small intestine of a mammal. They are incorporated into the cell surface membranes of the microvilli. Which one of the following is the main advantage of incorporating these enzymes into the membranes, rather than secreting them into the lumen to mix with the gut contents?

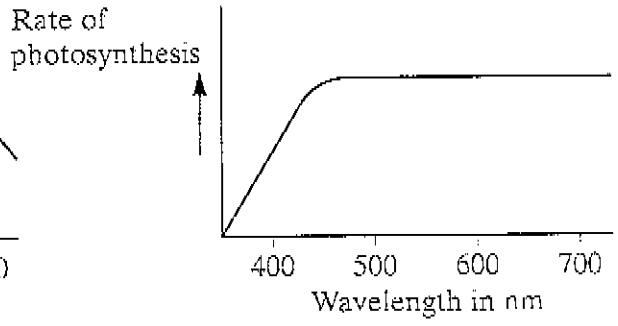
A The enzymes cannot move down the intestine away from the site at which they are synthesised.
B Enzyme molecules are often more stable if they are bound to a support.
C Hydrolysis of the substrate takes place close to the site where the products are absorbed.
D The surface area of the microvilli is greater than would be available if the enzymes were freely dissolved in the lumen of the intestine.

7 Which one of the graphs, **A-D**, represents the effect of wavelength of light on the rate of photosynthesis in a plant such as wheat?

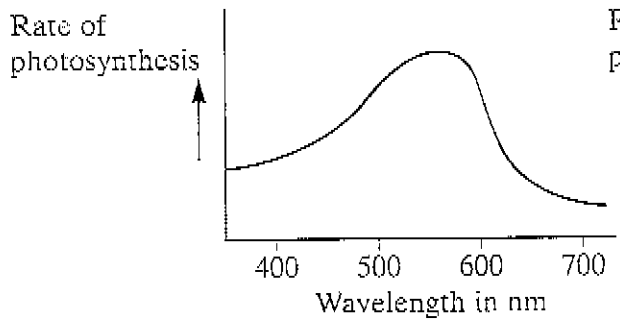
A



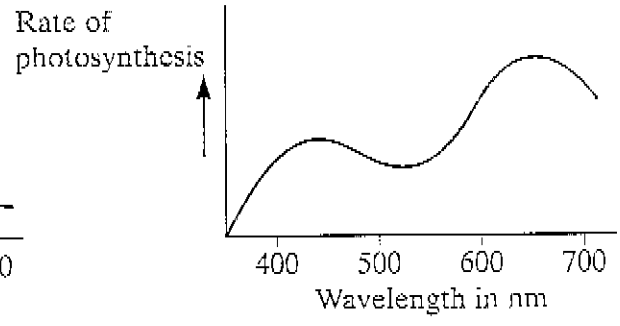
B



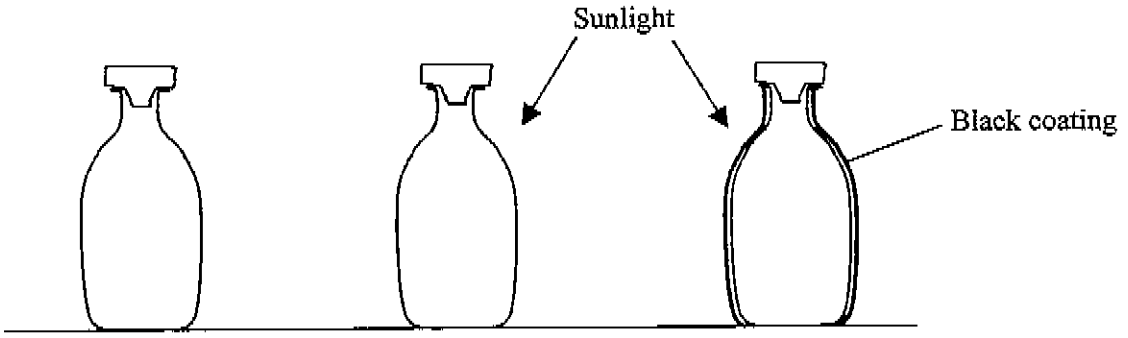
C



D



8 Samples of phytoplankton (microscopic floating green algae) were taken from a lake and placed in three sealed, clear-glass bottles.



Dissolved oxygen measured immediately (B1).

Incubated for 1 hour in sunlight to allow phytoplankton to photosynthesise. Then dissolved oxygen measured (B2).

Incubated for 1 hour to allow phytoplankton to respire. Then dissolved oxygen measured (B3).

B1, B2 and B3 represent different measurements that were made.

Which one of the following pairs of calculations, **A-D**, will give the respiration rate and the net photosynthetic rate of the phytoplankton?

	Respiration rate	Net photosynthetic rate
A	(B2 – B3)	(B1 – B3)
B	(B1 – B3)	(B2 – B1)
C	(B1 – B3)	(B2 – B3)
D	(B3 – B1)	(B1 – B2)

9 The diagram shows part of the light-independent stage of photosynthesis.

Ribulose bisphosphate (RuBP) ⟶ Glycerate 3-phosphate (GP) ⟶ Carbohydrate

In which part of a palisade cell does this series of reactions take place?

A cytoplasm
B stroma of chloroplasts
C mitochondrial membranes
D thylakoid membranes of chloroplasts

Turn over ▶