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Biology

Standard level

Paper 1A

11 May 2026

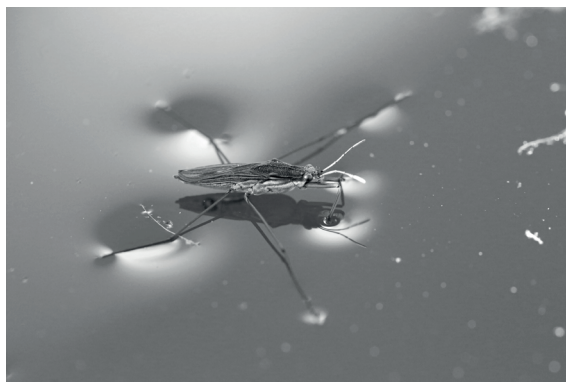
Zone A afternoon | **Zone B** afternoon | **Zone C** afternoon

1 hour 30 minutes [Paper 1A and Paper 1B]

Instructions to students

- Do not open this examination paper until instructed to do so.
- Answer all questions.
- For each question, choose the answer you consider to be the best and indicate your choice on the answer sheet provided.
- A calculator is required for this paper.
- The maximum mark for paper 1A is **[30 marks]**.
- The maximum mark for paper 1A and paper 1B is **[55 marks]**.

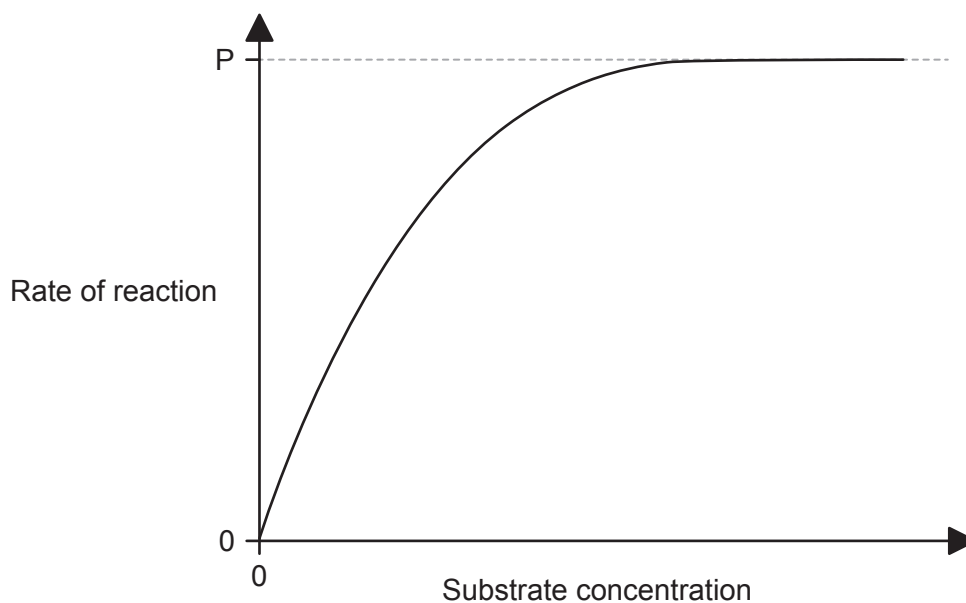
1. The common pond skater (*Gerris lacustris*) is an insect that can walk on the surface of water.



Which property of water allows it to do this?

- A. Cohesion of water molecules to the legs of the insect
 - B. Attraction of water molecules to each other due to hydrogen bonding
 - C. Solvent properties of water linked to transport
 - D. Adhesion of water molecules to each other forming a surface tension
2. What is a similarity between starch and cellulose?
- A. They are formed by condensation reactions linking beta-glucose monomers.
 - B. They contain long branched chains of monosaccharides.
 - C. They are used for energy storage in plants.
 - D. Their large molecular size makes them insoluble.
3. Which statement about amino acids is correct?
- A. Essential amino acids are only contained in food obtained from animals.
 - B. Dipeptides are formed by the condensation of two amino groups.
 - C. Vegans can convert some amino acids into other types of amino acid.
 - D. Amino acids all have the same R-group.

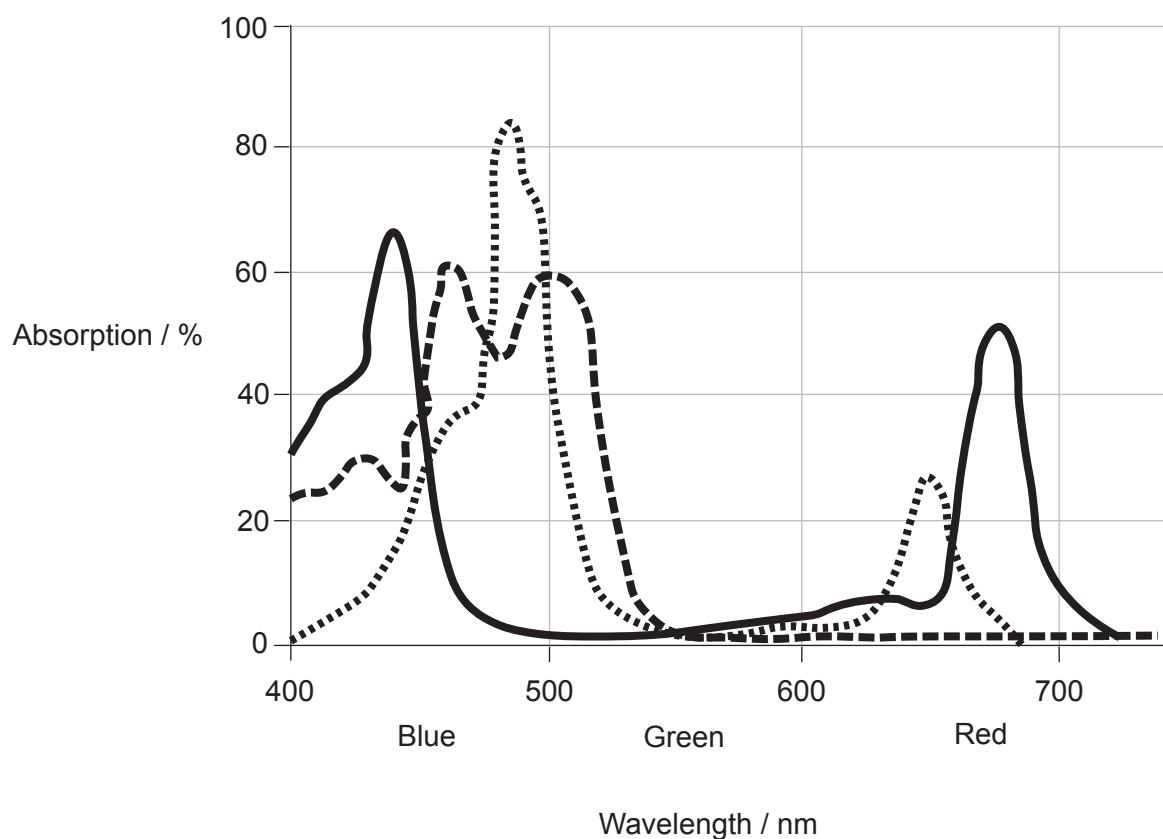
4. Lipase is an enzyme that breaks down fats in the digestive system. The optimum temperature for lipase is 37°C , and the optimum pH is 8.0. The graph shows the rate of reaction of lipase in an experiment being carried out at 32°C and a pH of 8.0.



How could the rate of reaction at P be increased?

- A. Increase the temperature by 5°C
- B. Lower the pH to a neutral pH of 7.0
- C. Increase the substrate concentration
- D. Lower the lipase concentration

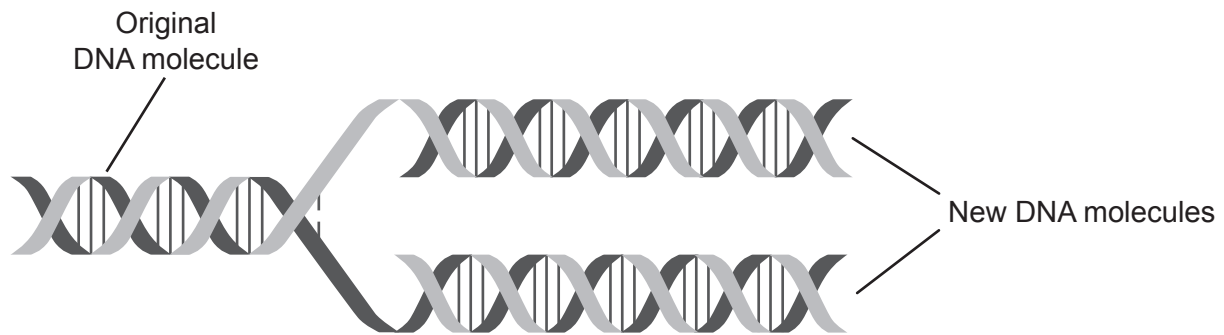
5. The graph shows the absorption spectra for three photosynthetic pigments found in a green plant.



What can be deduced from the graph?

- A. Green light is best for photosynthesis, as it is not absorbed by the plant.
- B. Shining a red light on the plant would cause it to release oxygen.
- C. The action spectrum will have a peak around 550 nm.
- D. The release of carbon dioxide will be greatest when blue light is shone on the plant.

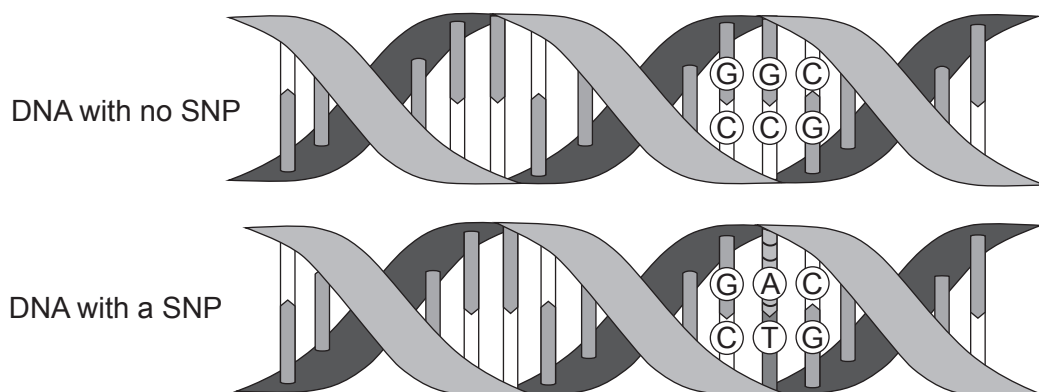
6. The image shows DNA replication.



What is the role of the enzyme helicase in DNA replication?

- A. Coil the new DNA molecule into a double helix
- B. Ensure that the two new DNA molecules are identical to the original molecule
- C. Join nucleotides to the original molecule to form the new molecules
- D. Break hydrogen bonds between bases in the original DNA molecule

7. The image shows a section of DNA in a gene with and without a single-nucleotide polymorphism (SNP). The table contains the triplet codes for four amino acids.

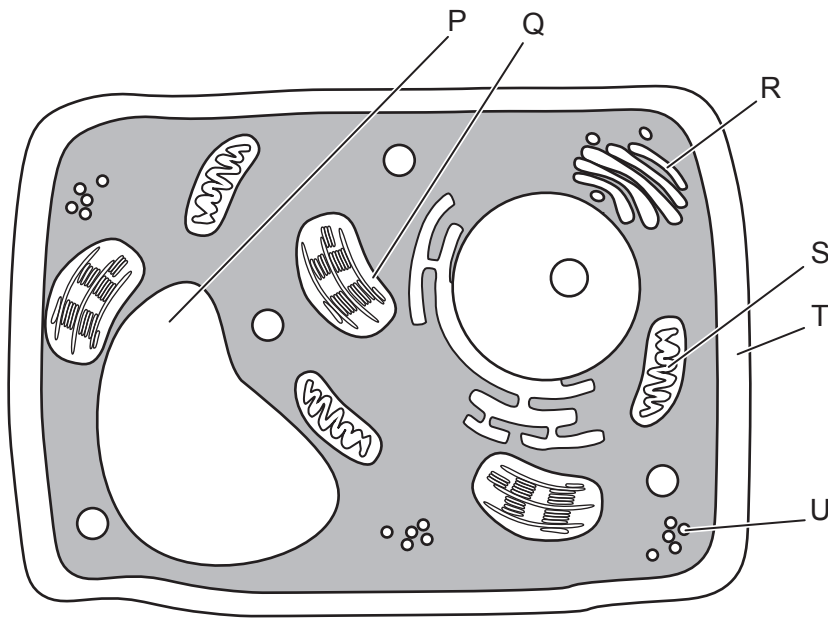


Glycine	Proline	Leucine	Aspartic Acid
GGT	CCT	CTT	GAT
GGC	CCC	CTC	GAC
GGA	CCA	CTA	
GGG	CCG	CTG	

Which statement about this section of DNA is correct?

- A. The gene containing the SNP would not code for a polypeptide due to a frameshift.
- B. There would be one amino acid difference in the polypeptide formed from the DNA with the SNP.
- C. The DNA with the SNP would code for the same polypeptide as the DNA with no SNP.
- D. The polypeptide formed by the DNA with the SNP would have one amino acid less.

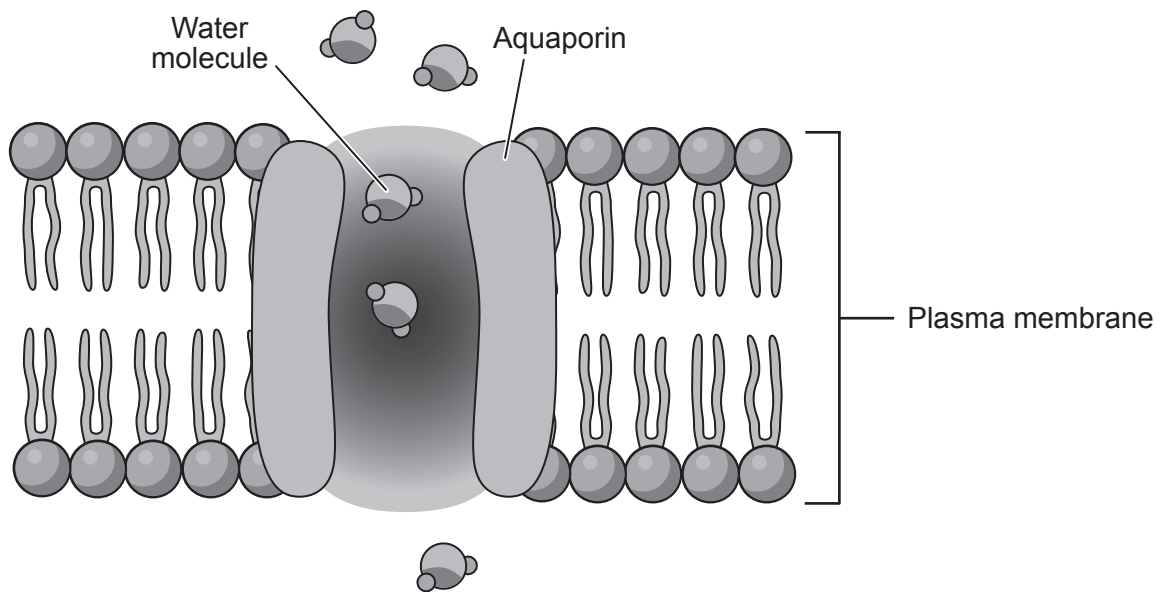
8. The diagram shows some of the structures found in a plant cell.



Which three structures would be found in a plant cell and not in an animal cell?

- A. P, Q and T
- B. Q, R and U
- C. P, R and S
- D. S, T and U

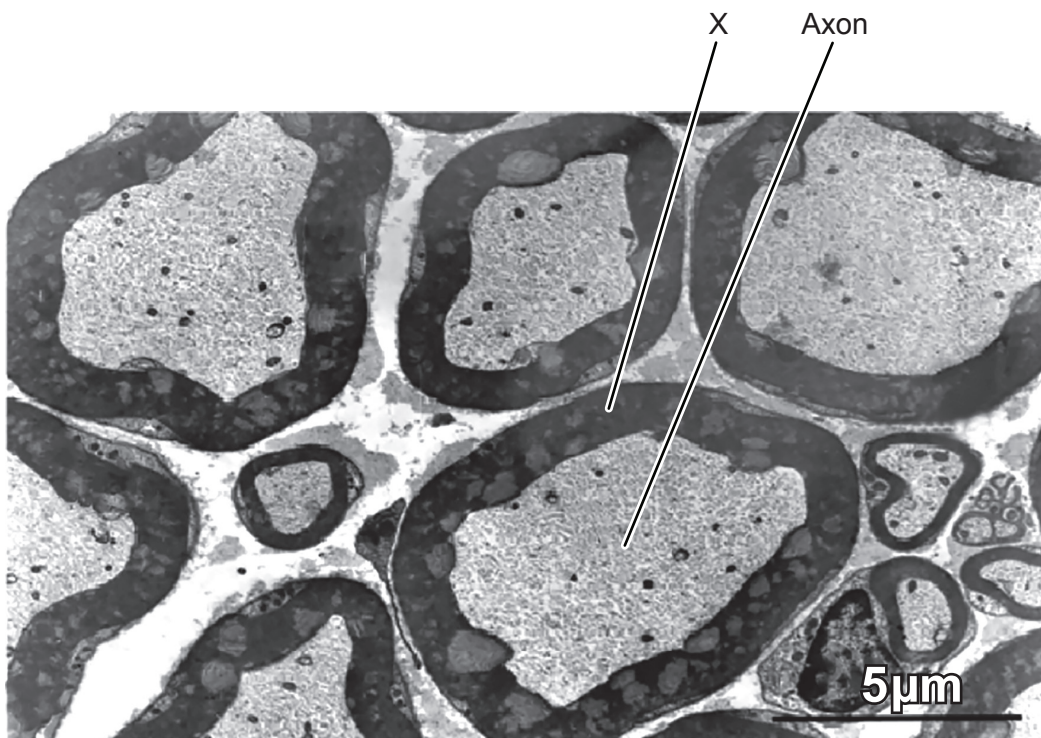
9. The diagram shows water molecules passing through an aquaporin in the plasma membrane.



What describes aquaporins?

- A. They are peripheral proteins that assist in removal of water from a cell.
 - B. They allow water to diffuse against the concentration gradient.
 - C. They have channels through which water passes by osmosis.
 - D. They use ATP to actively transport water across the membrane.
10. What is a characteristic of embryonic pluripotent stem cells?
- A. They can form from adult bone marrow cells.
 - B. They can divide to become totipotent stem cells.
 - C. They are fully differentiated to repair damaged tissue when required.
 - D. They can develop into a wide range of cells in the body.

11. The image shows a transverse section through the sciatic nerve as viewed under an electron microscope.



What is the function of the structure labelled X?

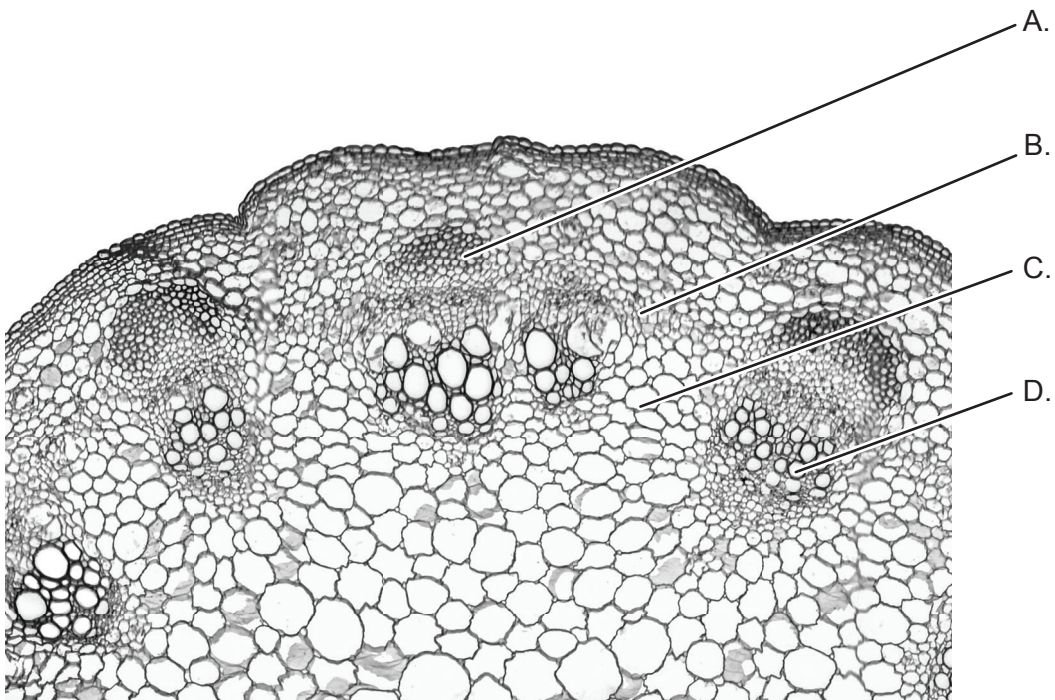
- A. It allows for rapid transmission of impulses along nerve fibres.
 - B. It initiates an action potential and triggers a nerve impulse.
 - C. It forms a synapse with surrounding neurones.
 - D. It pumps sodium and potassium ions across the plasma membrane.
12. Which process is common to both mitosis and meiosis in eukaryotes?
- A. Condensation of DNA by histone molecules
 - B. Reduction in the number of chromosomes
 - C. Homologous chromosomes being pulled apart by microtubules
 - D. DNA replication during prophase

13. The American alligator (*Alligator mississippiensis*) is a large reptile native to the United States and Mexico.

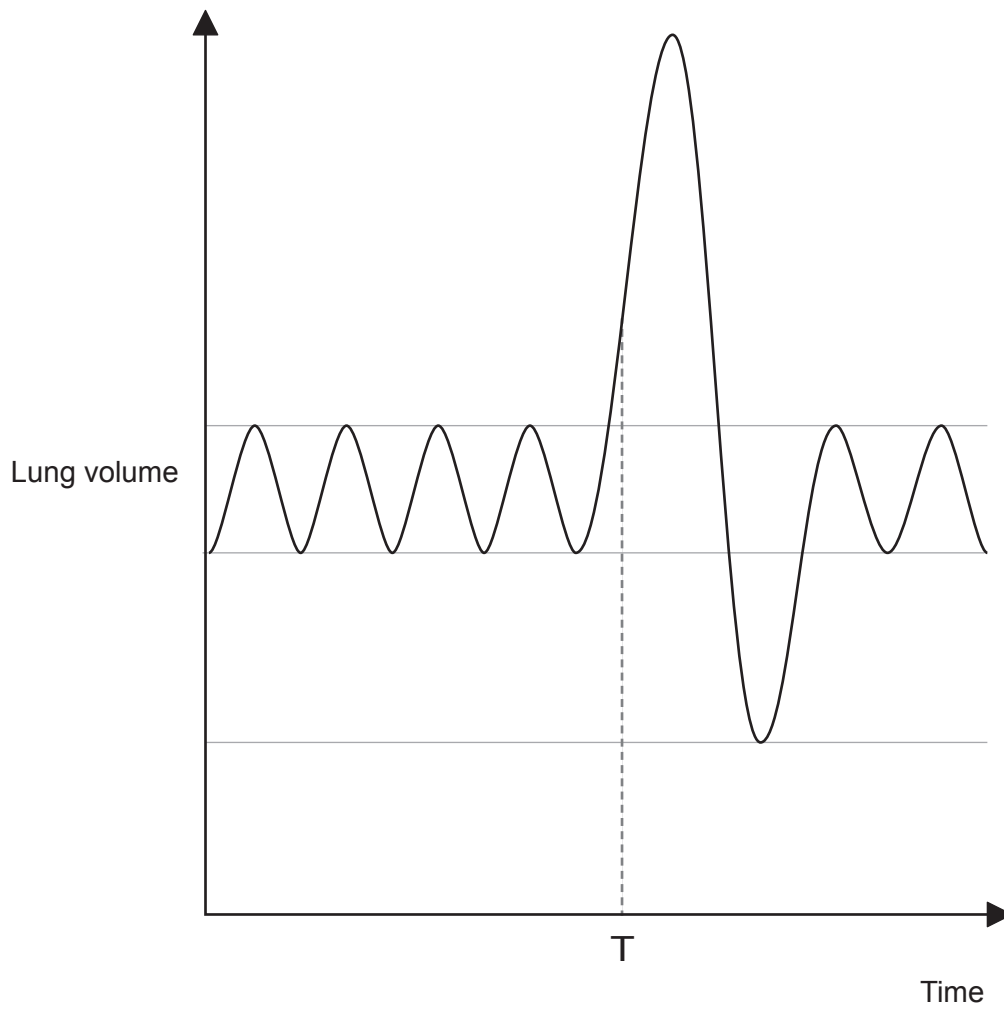


Which genus does it belong to?

- A. Animal
 - B. Reptile
 - C. *mississippiensis*
 - D. *Alligator*
14. The micrograph shows the tissues present in a transverse section of the stem of a sunflower (*Helianthus*), a dicotyledonous plant. Which cells are adapted for water transport?



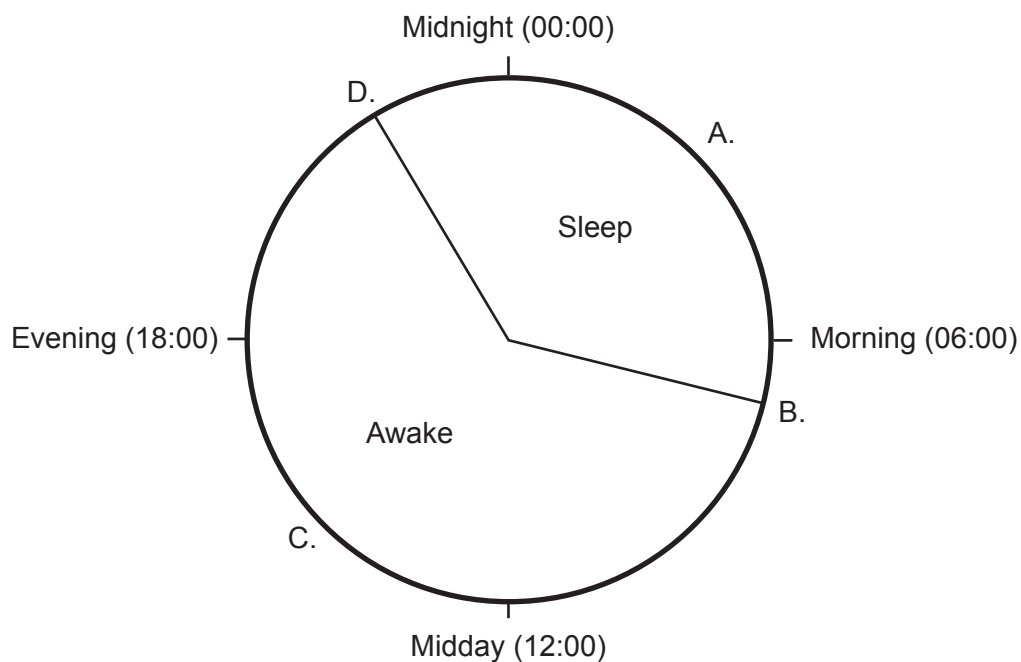
15. The graph shows changes in lung volume during ventilation.



What occurs at time T?

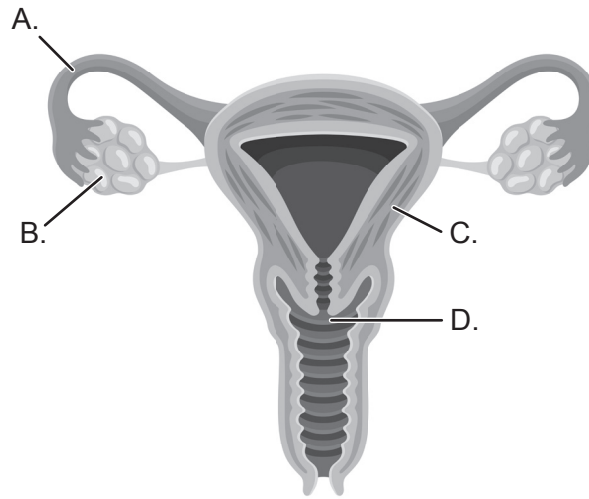
	Movement of the ribs	Diaphragm
A.	Upwards and outwards	contracts
B.	Inwards and downwards	contracts
C.	Upwards and outwards	relaxes
D.	Inwards and downwards	relaxes

16. What is stimulated when the blood pressure becomes too high?
- A. Chemoreceptors in the aorta
 - B. Chemoreceptors in the medulla
 - C. Baroreceptors in the aorta
 - D. Baroreceptors in the medulla
17. What would be necessary for a population to achieve herd immunity during an outbreak of a viral disease such as the COVID-19 pandemic?
- A. Provide the population with antibiotics
 - B. Vaccinate a high percentage of the population against the disease
 - C. Isolate those with the disease so it cannot spread
 - D. Use no vaccinations so the disease cannot spread
18. The diagram shows the circadian rhythm of a healthy adult woman. When would her melatonin levels be highest?

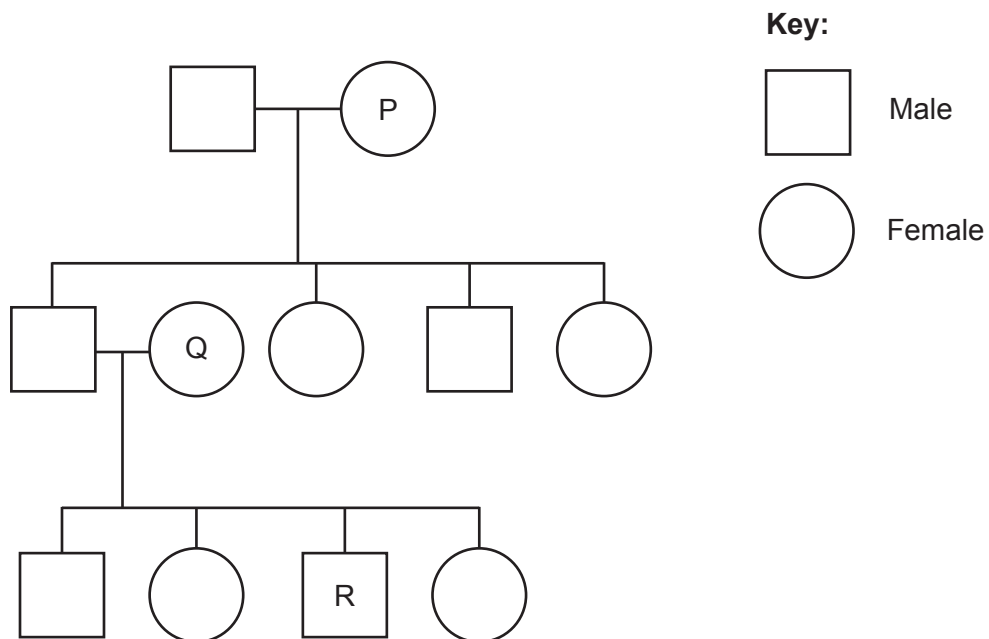


19. The image shows the human female reproductive system.

In which structure would mitosis normally occur to produce two diploid nuclei from the fertilized egg?



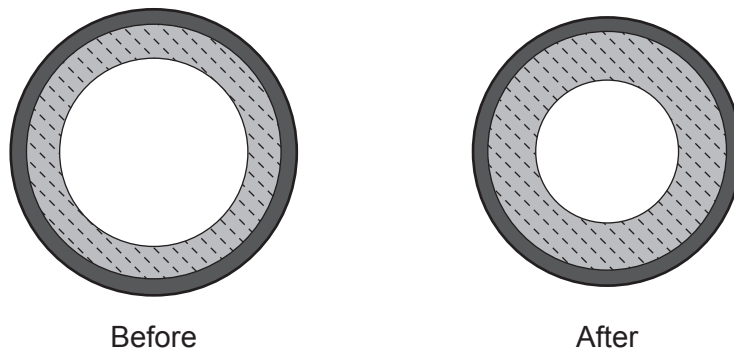
20. The diagram shows a pedigree chart. P is a carrier for haemophilia.



What is the probability that R has haemophilia, assuming that Q does **not** carry the gene for haemophilia?

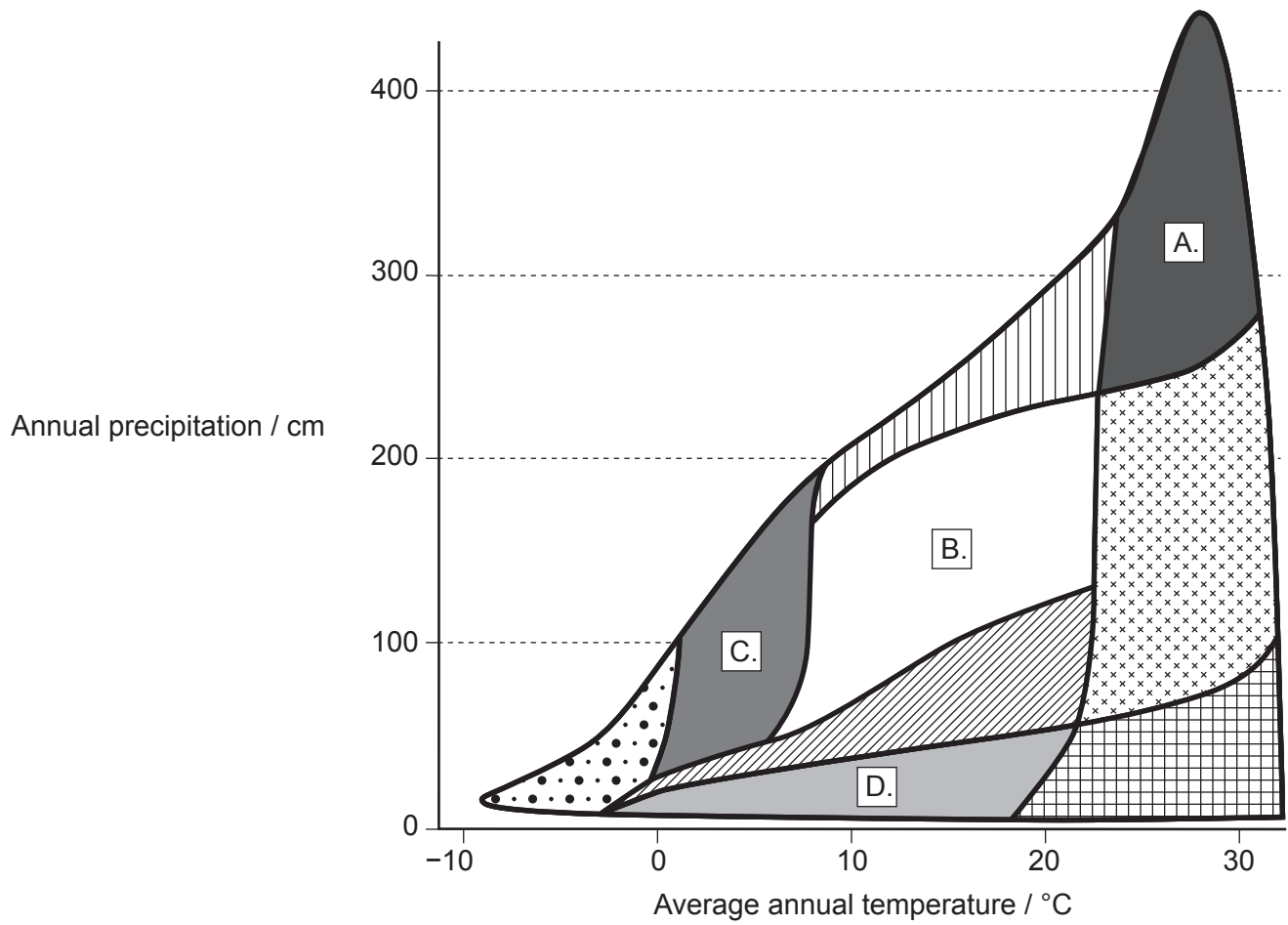
- A. 0 %
- B. 25 %
- C. 50 %
- D. 100 %

21. The diagram illustrates the diameter of the arterioles near the surface of the skin narrowing due to a change in environmental temperature.



- Which other change could be taking place at the same time?
- A. An increase in sweat released by the sweat glands
- B. Relaxation of hair muscle cells so body hair lies flat
- C. Shivering to generate metabolic energy
- D. A decrease in thyroxin secretion
22. The wings of both birds and insects enable flight but have different evolutionary origins. What describes the evolution of wings in both?
- A. They are homologous structures, as they have a similar function.
- B. They both have a pentadactyl structure, adapted from an ancestor.
- C. They are analogous, as birds evolved from insects.
- D. They show convergent evolution, as both adapted to similar environments.
23. Which factor leading to loss of trees in an ecosystem would be considered anthropogenic?
- A. Lightning causing a fire that destroys part of a woodland
- B. Long periods of drought causing death of trees
- C. Construction of a dam that floods an area of forest
- D. An invasion of insects that feed on leaves and young saplings

24. The diagram shows how biomes are divided according to temperature and rainfall. Which biome represents a temperate forest?



25. The image shows a strangler fig plant, an epiphyte of the genus *Ficus*, growing on the trunk of a tree in the rainforest in Queensland, Australia.



How does the strangler fig plant benefit from growing on the tree?

- A. Fig plants gain water from the xylem of the tree.
 - B. Young fig plants receive light for photosynthesis.
 - C. Fig plants feed on the sap of the tree.
 - D. Young fig plants obtain gases for respiration from the tree.
26. What could be estimated using the Lincoln index?
- A. The number of snails in a pond
 - B. The biodiversity in a woodland
 - C. The distribution of plants in an intertidal zone
 - D. The number of species of bird in a nature reserve

27. The image shows the fungus *Penicillium* growing on an orange which has been left in the open for several weeks.



What is a reason that *Penicillium* produces the antibiotic penicillin?

- A. To digest the surface of the orange for food
 - B. To help humans fight infectious diseases
 - C. To recycle the nutrients contained in the orange
 - D. To prevent competition with other microbes
28. What is a reason that the accumulation of carbon compounds by secondary production is less than primary production in an ecosystem?
- A. Plants carry out less photosynthesis in winter.
 - B. Some biomes have a lower capacity to accumulate biomass.
 - C. Heterotrophs use carbon compounds as a source of energy.
 - D. Autotrophs do not carry out respiration.

29. What would promote natural selection?

- I. Global warming increasing the temperature of the oceans
- II. Moths of the same species having wings of different colours
- III. Asexual reproduction

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

30. What is a reason that eutrophication, due to the overuse of fertilizer, can cause a decrease in biodiversity?

- A. Biomagnification of phosphates causes the death of consumers in higher trophic levels.
 - B. Increased algal growth leads to oxygen deficiency, causing the death of aquatic animals.
 - C. More agricultural crops means that there is less land available for rewilding.
 - D. Leaching of nitrates decreases the biochemical oxygen demand, killing fish.
-

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