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Examination Station

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Paper 1

For each question, choose the most suitable option (A, B, C and D).

1. Figure 1 shows an organelle.



Figure 1

Which of the following describes its function?

- A It absorbs oxygen.
- B It releases energy.
- C It absorbs light.
- D It synthesises proteins.

2. Which of the following describes the heart?

- A It is a cell.
- B It is an organ.
- C It is an organ system.
- D It is a tissue.

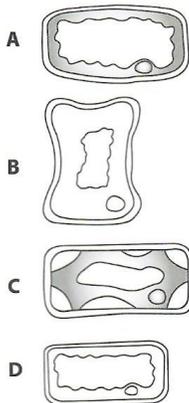
3. Four potato slices of the same mass, size and shape are each placed into four containers containing different liquids. Which combination of solutions can cause the potato slices to gain the greatest mass and the least mass respectively?

	Liquid That Causes Potato Slices to Gain the Greatest Mass	Liquid That Causes Potato Slices to Gain the Least Mass
A	Dilute salt solution	Concentrated salt solution
B	Concentrated salt solution	Dilute sugar solution
C	Dilute sugar solution	Distilled water
D	Distilled water	Concentrated salt solution

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4. Which of the following statements about osmosis is **true**?
- A It involves the movement of salts down a concentration gradient.
 - B It can only take place in animal tissues.
 - C It can occur across the cell membrane of plants.
 - D It requires energy when moving substances against their concentration gradient.

5. Which of the following shows a plant cell that has been placed in a solution with a lower water potential?



6. Table 1 shows the final colour when a beverage was tested with various test reagents.

Table 1

Test Reagent	Final Colour
Biuret solution	Violet
Benedict's solution	Brick-red
Iodine	Brown

What does the beverage contain?

- A Fat and reducing sugars only
- B Protein and starch only
- C Protein and reducing sugars only
- D Starch and reducing sugars only

7. Which of the following statements about enzymes is **not** true?

- A Denaturation increases enzyme activity.
- B One particular enzyme is responsible for many different reactions that occur in the cell.
- C An enzyme is denatured when it loses its three-dimensional shape and cannot function.
- D Some enzymes are made of lipids.

8. According to the lock and key hypothesis, which is the lock and which is the key for the enzyme pepsin (a protease)?

	Key	Lock
A	Protein	Pepsin
B	Starch	Pepsin
C	Pepsin	Pepsin
D	Pepsin	Starch

9. Figure 2 shows the human digestive system.

In which part does the digestion of proteins begin?

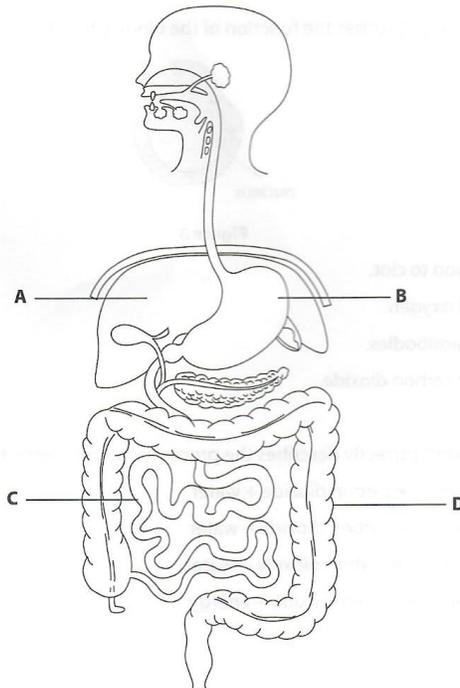


Figure 2

10. In which organ are digested food materials absorbed?

- A Liver
- B Ileum
- C Stomach
- D Pancreas

11. Which of the following describes the function of bile?

- A It chemically digests fats.
- B It breaks fat into smaller droplets.
- C It causes the pH of the small intestine to be acidic.
- D It activates the enzymes that digest starch.

12. Oxygenated blood moves from the heart to the rest of the body through the _____.

- A aorta
- B vena cava
- C pulmonary vein
- D pulmonary artery

13. Which of the following describes the function of the blood cell in Figure 3?

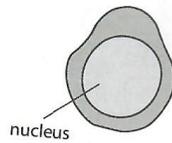


Figure 3

- A They cause blood to clot.
- B They transport oxygen.
- C They produce antibodies.
- D They transport carbon dioxide.

4. Which of the following correctly describes the process of aerobic respiration?

- A energy + oxygen → carbon dioxide + water
- B energy + glucose → carbon dioxide + water
- C glucose + oxygen → carbon dioxide + water
- D glucose + water → carbon dioxide + energy

15. _____ in cigarette smoke increases the risk of lung cancer.

- A Carbon monoxide
- B Carbon dioxide
- C Nicotine
- D Tar

16. Which of the following **correctly** matches the disease with its mode of transmission?

	Disease	Mode of Transmission
A	Syphilis	Droplets in the air
B	Dysentery	Droplets in the air
C	Cancer	Direct contact
D	AIDS	Direct contact

17. The instrument in Figure 4 is used to measure the rate of _____.

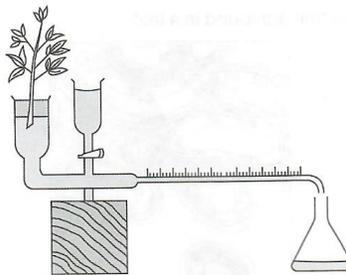


Figure 4

- A photosynthesis
- B transpiration
- C respiration
- D none of the above

18. The walls of xylem vessels are strengthened with _____.

- A cellulose
- B lignin
- C starch
- D glucose

19. The graph in Figure 5 shows the rate of photosynthesis plotted against an unknown factor.

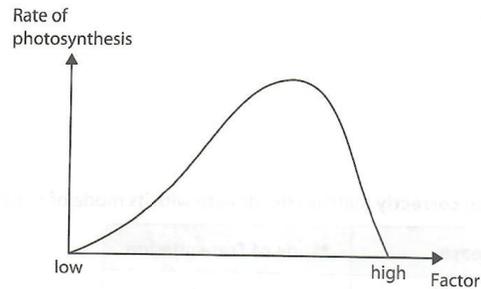


Figure 5

Which factor is represented in the graph?

- A Carbon dioxide
- B Light intensity
- C Oxygen concentration
- D Temperature

20. Figure 6 shows the structures that are found in a leaf.

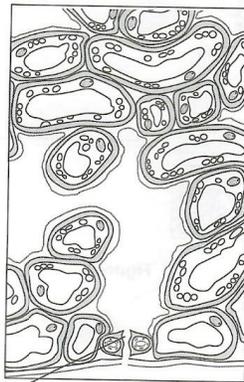


Figure 6

Which of the following **correctly** identifies X?

- A Guard cell
- B Mesophyll cell
- C Epidermal cell
- D Stoma

Paper 2

Section A

Answer **all** questions in this section.

1. Figure 7 shows the effect of temperature on the rate of an enzyme reaction.

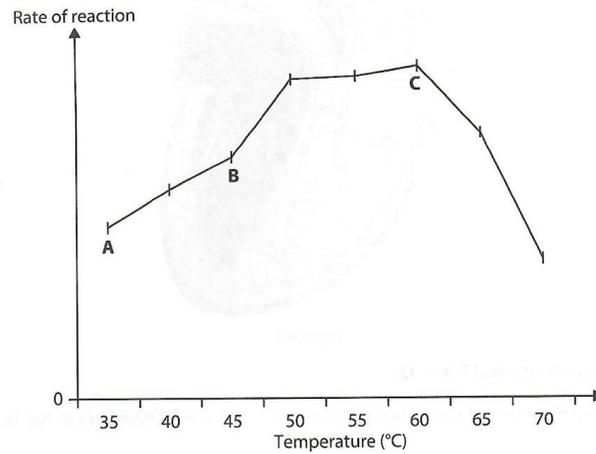


Figure 7

- (a) What are enzymes made of? [1]
- (b) State the optimum temperature of the enzyme in Figure 7. [1]
- (c) Explain why this is **not** a human enzyme. [1]

2. Figure 8 shows a vertical section of the human heart.

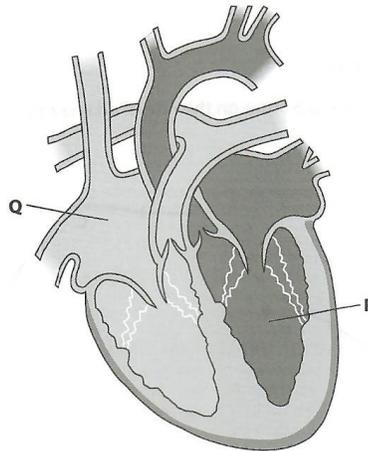


Figure 8

- (a) Name the parts labelled **P** and **Q**. [2]
 (b) Describe the direction of blood flow into and out of the left chambers of the heart. [1]
3. (a) Describe the chemical test used to test for the presence of starch. [1]
 (b) (i) Name the enzyme that digests starch. [1]
 (ii) State the basic unit formed when starch is completely digested. [1]
4. Figure 9 shows the structures that are involved in gaseous exchange.

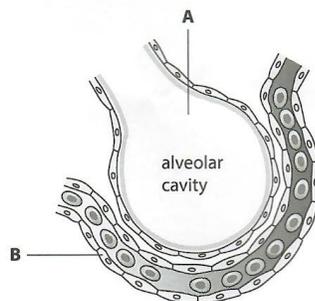


Figure 9

- (a) Name the parts labelled **A** and **B**. [2]
 (b) (i) Name the respiratory gas that diffuses from the alveolus into the blood capillary. [1]
 (ii) Explain why it diffuses in this direction. [1]
 (c) Explain how carbon monoxide in tobacco smoke affects the red blood cells. [1]

Section B

Answer any **two** questions.

5. Figure 10 shows an investigation that was set up using two identical potted plants, plant A and plant B.

At the start of the experiment, both plants were watered until water seeped out from the bottom of the pot. The polythene bag around each plant was watertight.

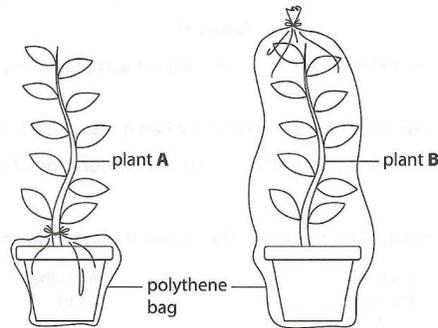


Figure 10

- (a) Table 2 shows the weight of the plants over a period of time.

Table 2

Time / h	0	2	4	6	10
Mean Weight of Plant A / g	37	35	33	31	27
Mean Weight of Plant B / g	38	38	38	38	38

- (i) Plot a graph using the data for the weight of the plants. [2]
 (ii) Use your graph to estimate the mass of plant A after 8 hours in the sun. [1]
 (iii) Calculate the rate of weight loss for plant A. [2]
- (b) (i) Explain why plant A was observed to lose weight. [2]
 (ii) Name the force that drives water and mineral salts up a plant stem. [1]

6. (a) Define osmosis. [1]
 (b) Figure 11 shows a plant cell and a human red blood cell that were placed separately into dishes containing equal volumes of different solutions.



Figure 11

- (i) Explain what happened to the plant cell when it was placed in concentrated salt solution. [2]
 (ii) Explain what happened to the animal cell when it was placed in distilled water. [2]
 (c) Explain how root hair cell is adapted for the efficient absorption of water from the soil. [3]
7. Figure 12 is a simplified diagram of the liver. The arrows show the direction of blood flow.

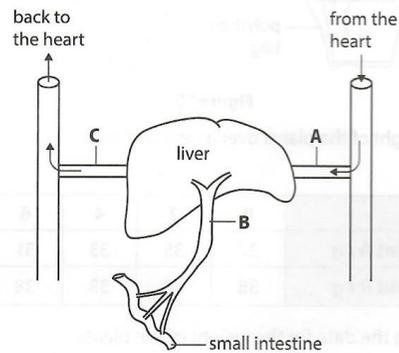


Figure 12

- (a) Identify blood vessels **A** and **B**. [2]
 (b) Describe how the liver removes excess amino acids. [2]
 (c) State what happens in the liver when the blood glucose level rises. [2]
 (d) Describe **two** factors that increase the risk of type 2 diabetes. [2]