

**Candidate Name****Candidate Number****Centre Name****Centre Number****Paper 1: Biology****Model Paper  
(2 hours)**

It is necessary to respond on the answer sheets provided alongside this question paper. Additionally, you must have a soft pencil (preferably of type B or HB), a clean eraser, and a dark blue or black pen.

**INSTRUCTIONS:**

- You must write your name, candidate number, centre name, and centre number on the answer sheets in the designated spaces.
- The objective section consists of 25 questions, and you must attempt all of them.
- Each question has four options labelled A, B, C, and D. Select the option that you think is correct. Mark it on the multiple-choice answer sheet using a soft pencil.
- Attempt all the questions from the subjective section using a dark blue or black pen.
- It is important to follow the instructions provided on the answer sheets.
- Do not use correction fluid.
- Avoid writing on any bar codes.
- You are allowed to use a calculator if needed.

**INFORMATION:**

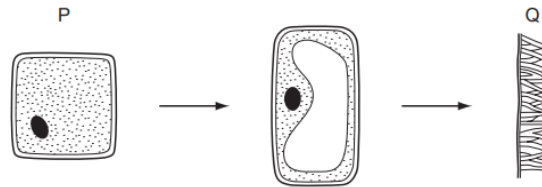
- This paper has a total of 100 marks.
- In the objective section, there are 25 questions, each carrying one mark. There is no negative marking for incorrect responses.
- Subjective section comprises 75 marks
- The number of marks assigned for every question or its parts is indicated within brackets ( ).

- Rough work must be completed on this question paper.

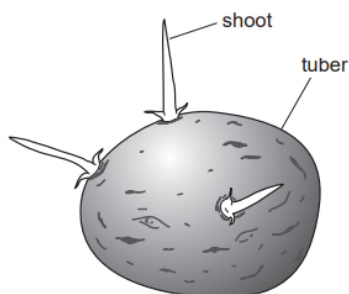
## Objective Section

Marks: 25

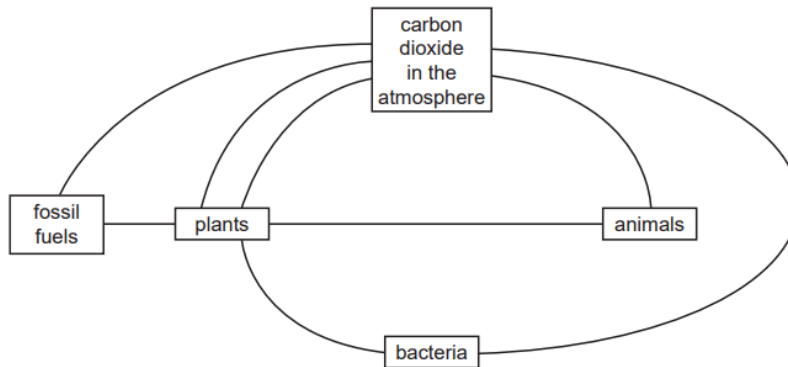
- In the production of protein A, both Gene 1 and Gene 2 are required. The role of gene 1 in this process is:**
  - It acts as the site for protein synthesis.
  - It codes for the mRNA needed to make protein A.
  - It codes for the amino acids in protein A.
  - It controls the expression of gene 2.
- Food poisoning and the alimentary canal lining can be damaged due to the bacterium *Salmonella enterica*, which hinders the absorption of digested food. Which particular part of the alimentary canal is predominantly affected?**
  - ileum
  - stomach
  - esophagus
  - colon
- The diagrams show the transformation from plant cell P to cell Q. What do these changes signify?**



- development and germination
  - growth and development
  - mitosis and growth
  - germination and mitosis
- How many bases are present in DNA?**
    - 2
    - 46
    - 23
    - 4
  - Which is not the consequence of alcohol consumption?**
    - loss of muscle coordination
    - stimulation of the nervous system
    - poor self-control
    - liver damage
  - A potato tuber originated from the stem of a potato plant with three shoots emerging from the tuber as shown in the diagram below. What would be the genotypes of the shoots contrast with that of the tuber and the parent?**



- A. The shoots are identical to the tuber but are different from the parent.  
 B. They are all different.  
 C. They are all identical.  
 D. The shoots are identical to each other but are different from the tuber and the parent.
7. **What variation is evident among the plants when the heights of pea plants are cultivated from 500 pea seeds?**  
 A. discontinuous variation only  
 B. continuous variation only  
 C. both continuous variation and discontinuous variation  
 D. neither continuous variation nor discontinuous variation
8. **In four test tubes with equal amounts of starch and salivary amylase, which test tube rapid breakdown of starch?**
- |          | pH | temperature<br>/ °C |
|----------|----|---------------------|
| <b>A</b> | 2  | 27                  |
| <b>B</b> | 2  | 37                  |
| <b>C</b> | 7  | 27                  |
| <b>D</b> | 7  | 37                  |
9. **If a light source is positioned 0.5 m from a plant resulting in a relative light intensity of 2 units on the plant. What will be the new relative light intensity on the plant now if the light source is moved to a distance of 1m away?**  
 A. 0.125  
 B. 0.5  
 C. 1.0  
 D. 0.25
10. **Which term is used to describe the characteristics of an organism?**  
 A. alleles  
 B. genotype  
 C. genes  
 D. phenotype
11. **The carbon cycle is shown in the diagram, with un-specified directions of movement. How many of the groups of living organisms release carbon dioxide into the atmosphere?**

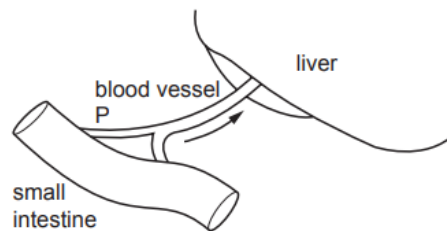


- A. 1  
B. 2  
C. 3  
D. 4

**12. What factor has not contributed to increasing global food production in the past century?**

- A. pesticides  
B. herbicides  
C. natural selection  
D. artificial selection

**13. Blood vessel P transports digested food toward the liver from the small intestine as shown in the figure below:**



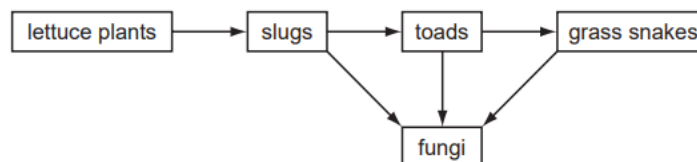
**After taking a carbohydrate-rich meal, which row describes the glucose level in blood vessel P and glycogen level in the liver?**

	glucose in blood vessel P	glycogen in liver
A.	High	Decreasing
B.	High	Increasing
C.	Low	Decreasing
D.	Low	Increasing

**14. Urea is produced in which part of the body?**

- A. liver  
B. small intestine  
C. muscles  
D. kidney

**15. Why are fungi important in the food web as decomposers?**



- A. They provide food for snakes.

- B. They release minerals essential for plant growth.
- C. They control the number of toads.
- D. They provide energy for plant growth.

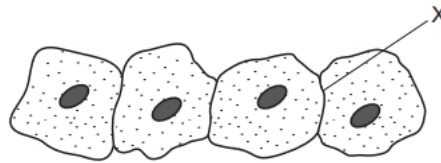
**16. Which statement describes most veins in the human body?**

- A. They have a pulse.
- B. They take blood away from the heart.
- C. They carry blood at high pressure.
- D. They have valves.

**17. Which of the following statements defines the characteristic feature of a double circulation?**

- A. In each circuit, blood passes from the heart to the lungs and then back to the heart before going to other parts of the body.
- B. In each circuit, blood passes through the atria and ventricles before going to other parts of the body.
- C. In each circuit, blood passes through the arteries and the capillaries before returning to the heart in veins.
- D. In each circuit, blood passes from the gut to the liver before going back to the heart.

**18. Which structure is present at X in the diagram showing some animal cells under the microscope?**



- A. one-cell membrane
- B. two cell membranes
- C. two cell walls
- D. one cell wall

**19. After holding her breath for 30 seconds, exhaling, and then inhaling, the air she breathes in contains less amount of what, as compared to the air she breathes out.**

- A. Carbon dioxide and water vapour.
- B. Oxygen and carbon dioxide.
- C. Oxygen and nitrogen.
- D. Nitrogen and water vapour

**20. Which type of cells are present in all sense organs?**

- A. effector
- B. receptor
- C. mesophyll
- D. ciliated

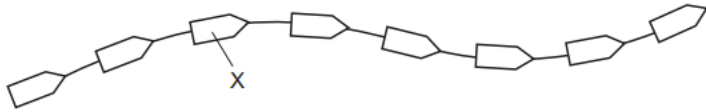
**21. Which two characteristics of living organisms are illustrated by Phototropism?**

- A. movement and nutrition
- B. growth and sensitivity
- C. nutrition and sensitivity
- D. growth and nutrition

**22. According to the level of organization, which series of terms are arranged in ascending order?**

- A. tissue → cell → organ → organ system
- B. cell → organ → tissue → organ system
- C. cell → tissue → organ → organ system
- D. tissue → organ → organ system → cell

**23. What does segment X show in protein molecules?**



- A. fatty acid
- B. sugar
- C. glycerol
- D. amino acid

**24. Which type of food is directly absorbed by the body without undergoing digestion?**

- A. fat
- B. water
- C. protein
- D. carbohydrate

**25. During transpiration, the majority of water evaporates from which part of a leaf?**

- A. the spongy mesophyll cells
- B. the cuticle
- C. the xylem vessels
- D. the guard cells

**Theoretical portion**

**Marks: 45**

1. (i) Suggest a method to measure the transpiration rate of the plant by using the apparatus.

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.....[3]

(ii) Explain the transformation in the cell's appearance if exposed to a concentrated salt solution.

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(iii) Propose reasons why children are more susceptible to vitamin D deficiency compared to adults.

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2. (i) A scientist examines certain plant tissues using a light microscope. The diameter of X is magnified 500 times Determine the actual diameter of X in standard form. Diameter = ..... mm. [2]

(ii) Elaborate on how a high level of TMV infection reduces plant growth.

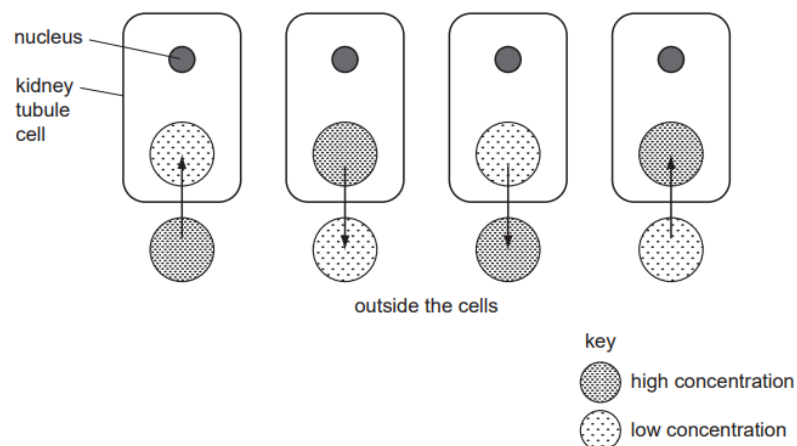
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[5]

(iii) In kidney tubules, substances move in and out of cells. The diagram shows four processes in cells lining the kidney tubule, shown by an arrow indicating the net movement of the substance.

[6]

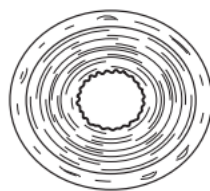




Complete the table with a reason for each answer.

process		reason
diffusion of oxygen		
active uptake of sodium ions		

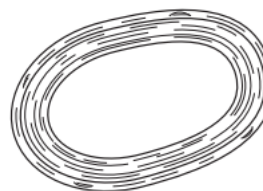
3. (i) Write functions of the following blood vessels [6]



artery



capillary



vein

- Artery

.....  
 .....

- Vein

.....  
 .....  
 ....

- Capillaries

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 .....  
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(ii) Draw a comprehensive diagram to show two features found in most viruses.

[5]

(iii) Describe the impact of the human immunodeficiency virus (HIV) on the immune system.

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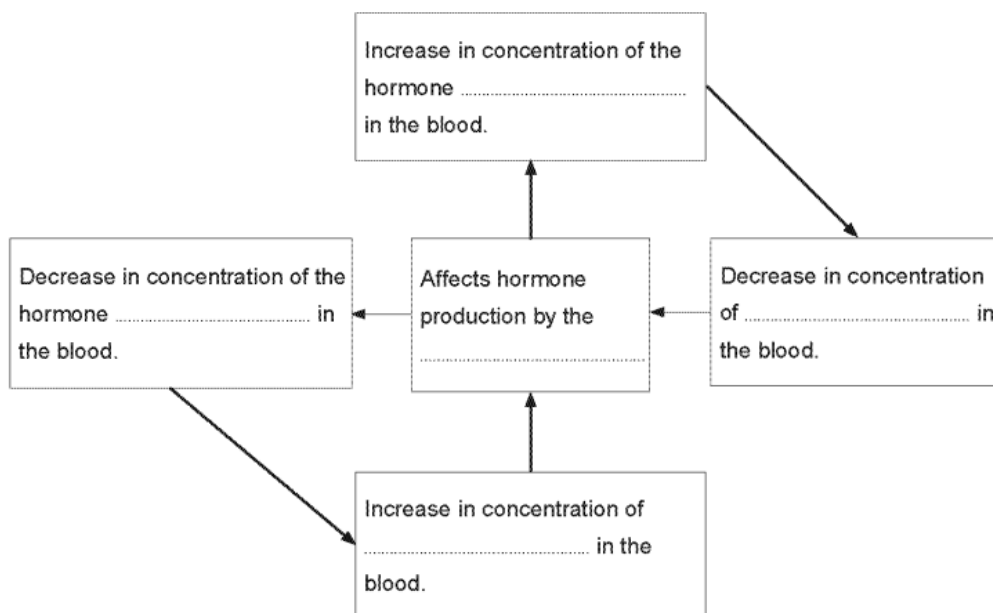
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[4]

4. (i) The flow chart shows the concept of negative feedback. Complete the blank spaces to show how the energy source in the blood is maintained at a consistent level. [5]



(ii) Identify two characteristics of hormones as shown in the flow chart.

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[2]

## Practical Portion

**Marks: 30**

1. (i) List two benefits of using an electric water bath.

[illegible]

[4]

- (ii) Write down the technical processes involving the observation of practical food tests, including (a) calorimetry of various foods, and (b) calculation of the energy content of food.

[illegible]

.....[6]

- (iii) What are the impacts of physical exercise on (a) the rate and depth of breathing, and (b) the measurement of vital capacity?

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2. Label the structure of the heart, including: (i) left atrium, (ii) right atrium, (iii) left ventricle, (iv) right ventricle, (v) septum, (vi) bicuspid and tricuspid valves, (vii) aortic, and (viii) pulmonary valves.

**3. Explain some identifying features of**  
**(i) Fungi**

