

Candidate Name

Candidate Number

Centre Name

Centre Number

**Paper 1:****Model Paper V1 Marking Scheme**

(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.
- Objective section consists of 25 questions, and it is essential that you 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 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.

**INFORMATION:**

- This paper has a total of 100 marks.
- In objective section there are 25 questions, each carries one mark. There is no negative marking for incorrect responses.
- In subjective section, 45 marks are for extended theory and 30 marks for practical component.
- The number of marks assigned for every question or its parts is indicated within brackets [ ].

**OBJECTIVES PORTION:****[Total 25 marks]**

- |       |       |
|-------|-------|
| 1. B  | 14. B |
| 2. A  | 15. B |
| 3. D  | 16. D |
| 4. D  | 17. B |
| 5. D  | 18. B |
| 6. B  | 19. C |
| 7. A  | 20. D |
| 8. B  | 21. C |
| 9. A  | 22. C |
| 10. D | 23. B |
| 11. A | 24. B |
| 12. D | 25. C |
| 13. B |       |

**THEORY PORTION:****[Total 45 marks]**

1.
  - (i) Diffusion
  - (ii) Active Transport
  - (iii) The xylem is responsible for the upward transport of water and dissolved minerals from the roots to the rest of the plant.
2.
  - (i)
    - The genetic material is primarily composed of deoxyribonucleic acid (DNA), a long, double-stranded molecule made up of nucleotide subunits.
    - Each nucleotide molecule contains a phosphate group, a sugar molecule (deoxyribose), and the nitrogenous bases:
      - Adenine (A)
      - Thymine (T)
      - Cytosine (C)
      - Guanine (G)
  - (ii)
    - Stem cells are extracted from the bone marrow of the donor person and transferred to a recipient, which then migrate into the recipient's bone marrow.
    - They proliferate and differentiate into healthy blood cells.
    - This process replenishes the recipient's blood cell supply and treats medical conditions.
    - Bone marrow transplantation can cure diseases by replacing damaged marrow.
  - (iii)
    - A recessive allele causes Wolfram's Syndrome.
    - Allele changes, like mutations, can disrupt protein structure or function.

- This disruption can lead to the loss of normal functioning of protein or the acquisition of harmful functions.
- In Wolfram's syndrome, malfunctioning proteins disrupt the cellular processes.

3.

(i)

- The findings in the figure do not directly support the theory that stripes help in cooling zebras.
- The data only show the change in temperature of water wrapped with different animal skins.
- Zebra skin shows a slightly lower temperature compared to the horse skin, it doesn't demonstrate that stripes are responsible for this cooling effect.

(ii)

- To investigate skin color's effect on temperature regulation, one improvement could be to select skin samples from different animals with varying skin colors, e.g. similar fur texture but different colors, such as white, black, and brown.
- This would enhance the reliability of their findings and provide an investigation into the effect of skin color on temperature regulation.

(iii)

- A. Stigma
- B. Anther
- C. Petal
- D. Style

4.

(i)

- During digestion, glucose is absorbed in the small intestine.
- It enters the bloodstream through epithelial cells which line the intestine.
- Blood vessels then carry glucose to muscle cells, through facilitated diffusion or active transport
- Glucose produces ATP by undergoing glycolysis for muscle contraction.

(ii)

- In yeast cells, anaerobic respiration occurs in the absence of oxygen in the cytoplasm, while in muscle cells, anaerobic respiration occurs during exercise when oxygen demand is high.
- Yeast cells produce ethanol and carbon dioxide as byproducts of anaerobic respiration, while Muscle cells produce lactic acid as a byproduct.
- In yeast cells, anaerobic respiration is used in the bread-making and brewing industries, while in muscle cells it helps sustain short bursts of intense activity but leads to fatigue due to lactic acid buildup.

(iii)

Lungs

(iv)

- Blood is pumped from the heart to the lungs through the pulmonary artery, where it picks up oxygen and releases carbon dioxide.
- This oxygenated blood returns to the heart via the pulmonary veins enters into the left atrium, and then to the left ventricle.

- From the left ventricle, the oxygenated blood is pumped out through the aorta to the rest of the body.

5.

(i)

- Yeast cells are eukaryotic, while bacterial cells are prokaryotic.
- Yeast cells possess membrane-bound organelles e.g. a nucleus and mitochondria, whereas bacterial cells lack these membrane-bound organelles.

(ii)

The yeast cells do not contain the necessary organelles and pathways to perform photosynthesis, by which plant cells produce glucose using light energy, carbon dioxide, and water.

(iii)

The ovum, or egg cell, passes down the uterus through ovulation and fertilization:

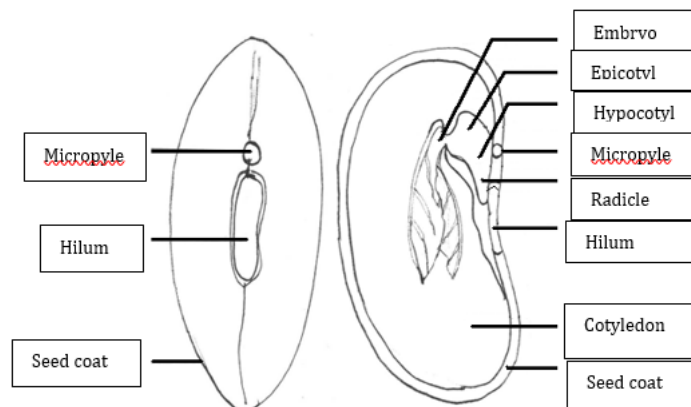
- At the midpoint of the menstrual cycle, one egg cell is released from the ovaries.
- If it encounters sperm and is fertilized, it forms a zygote, which then travels down the fallopian tube toward the uterus.
- It will implant into the uterine lining to mark the start of pregnancy.

## PRACTICAL PORTION:

[Total 30 marks]

1.

(i)



(ii)

Benedict's reagent is used to detect the presence of reducing sugars in a solution. The procedure of Benedict's test on urine samples:

- Take a urine sample and transfer it into a test tube, containing Benedict's reagent
- Gently shake the test tube.
- Boil the mixture for a few minutes and observe the color change in the solution.
- The green, yellow, orange, or brick-red color indicates the presence of reducing sugars in the urine sample.

2.

(i)

<b>Insect-Pollinated Flowers</b>	<b>Wind-Pollinated Flowers</b>
Large, varied pollen grains.	Small, uniform pollen grains
Smaller quantities of pollen.	Larger quantities of pollen.
Contains proteins and nutrients to attract insects.	Fewer proteins and nutrients.
Sticky surface.	Smooth surface.
Vibrant colors to attract pollinators.	Dull colors.

(ii)

To calculate the surface area of a leaf using grid paper:

- Measure the dimensions of each square on the grid paper.
- Lay the leaf on the grid paper, to count the number of full squares covered by the leaf, e.g. if a square is half-covered, count it as 0.5 square.
- Multiply the total number of squares by the area of each square.
- Summarize the findings, expressing the surface area of the leaf in square centimeters.

(iii)

- Use hydrogen carbonate indicator to study plant metabolism.
- Compare respiration and photosynthesis under light and dark conditions.
- Observe color changes in the indicator to determine metabolic activity.
- Record observations to understand the influence of light on plant processes.