

Candidate Name

Candidate Number

Centre Name

Centre Number

Paper 2:

Model Paper V2 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. A | 14. D |
| 2. A | 15. A |
| 3. C | 16. C |
| 4. D | 17. A |
| 5. B | 18. A |
| 6. D | 19. B |
| 7. C | 20. B |
| 8. C | 21. A |
| 9. B | 22. D |
| 10. C | 23. C |
| 11. B | 24. A |
| 12. A | 25. C |
| 13. D | |

THEORY PORTION:**[Total 45 marks]****1.****(i)** Root hair cell**(ii)**

- Photosynthesis
- Reduced transpiration
- Water Storage

(iii) Long, thin root hair and abundance of mitochondria**(iv)** Chlorophyll**2.****(i)** By two mechanisms; TMV damages the structure of the cell and disrupts photosynthesis.**(ii)**

Gametes ♂ \ ♀	R	r
R	Rr Round	Rr Round
r	Rr Round	rr Wrinkled

(iii) Substrate molecules bind at the active site and undergo a chemical reaction. Active site lowers the activation energy to transform substrate into products.**(iv)** Due to the low immunogenicity of the cornea, the use of topical immunosuppression and surgical techniques reduces exposure to the immune system.

3.

(i)

Substance	Direction of Movement	Reason
Amino acids	from mother to fetus	Essential for fetal growth and development
Carbon dioxide	from fetus to mother	Waste gas from fetal respiration
Glucose	from mother to fetus	Provides energy for fetal metabolism
Oxygen	from mother to fetus	Required for fetal respiration and energy production
Urea	from fetus to mother	Waste product from fetal metabolism

(ii) Great tits play a role as herbivores by feeding on seeds and carnivores by feeding on insects.

(iii) Both species hunt small mammals and inhabit woodland areas. Competition may arise if resources are limited.

4.

(i)

- On the sunny beach (Diagram A), her pupil constricts to limit light exposure.
- In the dark café (Diagram B), her pupil dilates to allow more light for better vision.

This response is controlled by the iris muscles.

(ii) R plasmid contains the amp^R gene, which provides antibiotic resistance. It identifies the successfully incorporated R plasmid cells that allow researchers to select and maintain genetically modified organisms.

PRACTICAL PORTION:

[Total 30 marks]

1.

(i) Person B

(ii) Person D

(iii) High cholesterol causes atherosclerosis which causes narrowing of arteries and restriction of blood flow, leading to angina or heart attack due to reduced oxygen supply.

(iv) 1.5 times

2.

(i) To estimate buttercup plant coverage, randomly place quadrats. Count buttercup-containing squares to calculate the percentage of coverage per quadrat and average values for the field.

(ii)

- Soil moisture
- Soil nutrients
- Light availability

3.

(i) Same type and amount of plant material, constant **environmental conditions (light, humidity, temp), and equal size of sections.**

(ii)

- The scientists collect water samples.
- They use aseptic techniques to assess the antibiotic resistance of bacteria.
- They place antibiotic-containing discs on agar plates.
- After incubation, they measure zones of inhibition.
- Small or absent zones suggest antibiotic resistance.