

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:

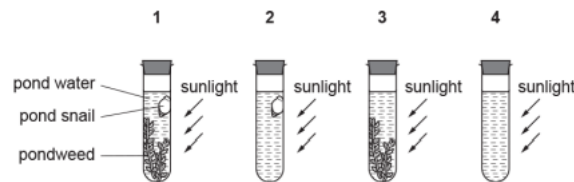
- This paper has a total of 100 marks.
- In the objective section, there are 25 questions, each carrying one mark. There is no negative marking for incorrect responses.
- Subjective section comprises 75 marks

- 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

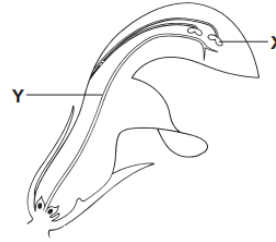
Marks: 25

1. Which process leads to eutrophication in a lake?
 - A. factory releasing bleach into a lake
 - B. pesticides entering from farmland
 - C. power station releasing hot water
 - D. fertilizers entering from farmland
2. Which factor contributes to the rise in the carbon dioxide concentration in Earth's atmosphere?
 - A. less combustion of fossil fuels
 - B. more combustion of stored carbon compounds from dead organisms
 - C. people breathing faster
 - D. more photosynthesis by plants
3. Why are the consequences of the majority of mutations not noticeable?
 - A. Most mutations do not affect the genotype or phenotype.
 - B. Mutations mainly affect internal body processes.
 - C. Most mutations do not affect the phenotype.
 - D. Mutations often kill the organism.
4. Pond snails and weeds are submerged in water-sealed tubes, where carbon dioxide dissolves and forms an acid. Which of the following test tubes have the most acidic water?



- A. 1
 - B. 2
 - C. 3
 - D. 4
5. What helps in the transformation of proteins into amino acids?
 - A. antibodies
 - B. hormones
 - C. auxins
 - D. enzymes
6. What is the effect of excessive alcohol consumption?
 - A. liver damage
 - B. shorter reaction time
 - C. reduced chance of HIV infection
 - D. improved self-control
7. Which blood vessel exhibits high blood pressure, high carbon dioxide concentration, and low oxygen concentration?
 - A. aorta
 - B. vena cava
 - C. pulmonary artery
 - D. pulmonary vein
8. What do X and Y represent in the diagram that shows a vertical section through a flower?

	X	Y
A	anther	filament
B	anther	style
C	filament	stigma
D	stigma	style



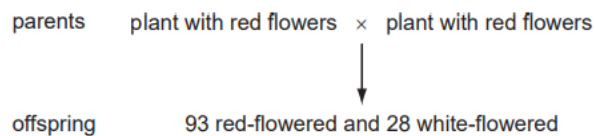
9. How does a blood cell in the renal artery transverse through the heart before returning to the renal artery?

- A. Once
- B. twice
- C. three times
- D. four times

10. What characteristic is shared by both plant and animal cells?

- A. a cell wall
- B. chloroplasts
- C. a large vacuole
- D. a cell membrane

11. What are the genotypes of the parents when two red-flowered plants cross? The allele for red flowers (R) is dominant over the white flowers (r)?



- A. RR and rr
- B. RR and Rr
- C. Rr and rr
- D. Rr and Rr

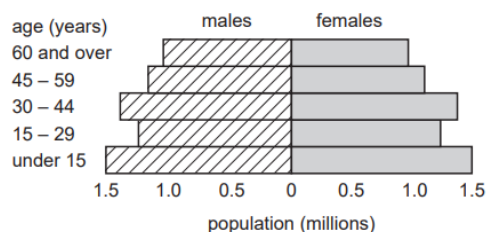
12. What regulates the concentration of blood glucose back to normal, when increased after a meal?

- A. blood cells
- B. platelets
- C. insulin
- D. adrenalin

13. The example of excretion in mammals is?

- A. the removal of undigested food through the anus
- B. the release of saliva into the mouth
- C. the removal of urea by the kidneys
- D. the release of hormones from glands

14. The age distribution of the human population is shown in the figure below. Which age group has the highest population count?



- A. under 15
- B. 60 and over

C. 30-44

D. 45-59

15. In a habitat, antelopes consume grasses and are themselves consumed by hyenas. What will be the primary source of energy for the grass?

A. antelopes

C. carbon dioxide

B. hyenas

D. the Sun

16. Why is the yeast used in bread-making?

A. to provide carbon dioxide

C. to provide ethanol

B. to provide lactic acid

D. to provide oxygen

17. What facilitates the rapid absorption of oxygen into the blood within the lungs?

A. The concentration of oxygen in the blood is higher than in the alveoli.

B. Alveoli have thin walls and a large surface area.

C. Air breathed in has less oxygen than air breathed out.

D. Alveoli have thick walls and a large surface area.

18. The role of the kidneys in the body of a healthy person is:

A. eliminate all salts

C. reabsorb all glucose

B. retain all water

D. break down toxins

19. The pupil constricts when a bright light is directed into the eye. Which phenomenon is this?

A. photosynthesis

C. voluntary response

B. a simple reflex

D. accommodation

20. In comparison to atmospheric air, the human exhaled air contains:

A. More water vapour, more carbon dioxide.

B. Less water vapour, more carbon dioxide.

C. More water vapour, less carbon dioxide.

D. Less water vapour, less carbon dioxide.

21. Which of the following components/structures in a cell possess a nucleus? (✓ = nucleus, X = no nucleus)

	red blood cell	root hair cell	xylem vessel
A	✓	✓	✓
B	✓	X	X
C	X	✓	X
D	X	X	✓

22. Which characteristic is common to cells of both plants and animals?

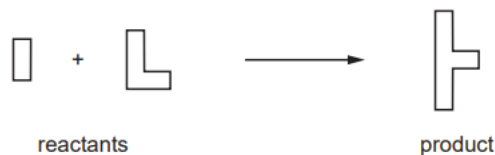
A. a cell wall

C. a large vacuole





B. chloroplasts

D. a cell membrane

23. A chemical reaction is shown in the diagram below.



Which diagram of the enzyme is involved in the process?

			
A.	B.	C.	D.

24. Which essential dietary component is less likely to be deficient in a meat-free diet?

- A. fibre
- B. vitamin D
- C. protein
- D. fat

25. Which of the following substances is required for protein synthesis, transported into a leaf from the stem?

- A. nitrate
- B. starch
- C. oxygen
- D. carbon dioxide

THEORETICAL PORTION

Marks: 45

1. Hormones are produced naturally by glands or artificially synthesized by pharmaceutical companies.

(i) Describe the role of progesterone in the menstrual cycle.

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..... [2]

(ii) Explain why testosterone improves athletic performance.

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..... [2]

(iii) Which gland secretes testosterone?

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..... [1]

(iv) Identify another hormone present in oral contraceptives besides synthetic progesterone

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..... [1]

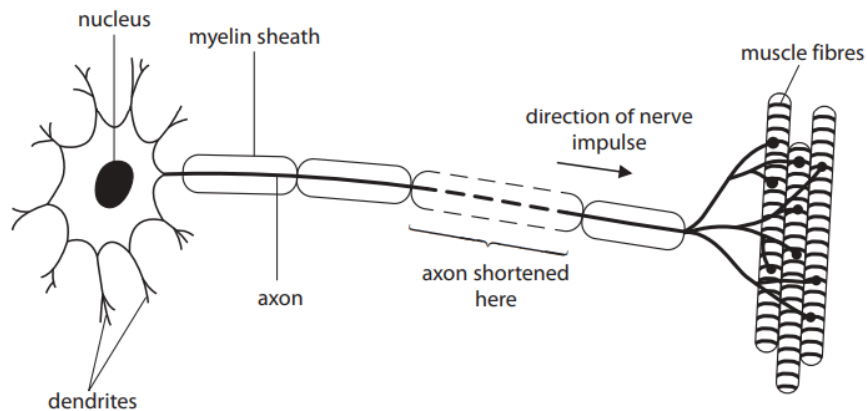
2. (i) Explain why monoclonal antibodies have advantages in treating cancer over conventional chemotherapy and radiotherapy.

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..... [5]

(ii) Which particular type of cell produces the monoclonal antibodies for cancer treatment?

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..... [2]

(iii) The motor neurons are specialized cells in humans. Suggest two methods to enhance their function.



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3. (i) Explain the differences between the blood on the left side of the heart and that on the right side.

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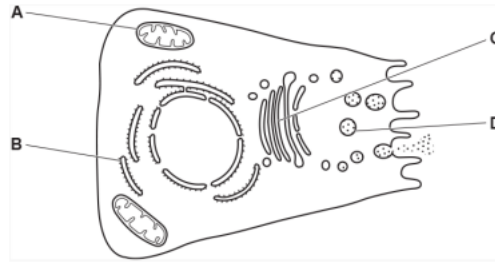
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(iii) Identify where cellular respiration occurs within a cell.



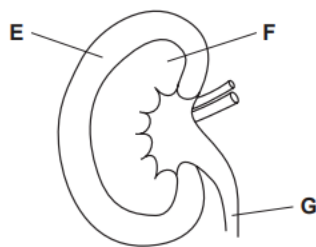
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 [2]

(iv) Injection of monoclonal antibodies is used in the treatment of RSV. Such antibodies can be produced using mice. The initial step involves injecting the virus into a mouse. Describe the remaining steps of this procedure in generating monoclonal antibodies.

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 [6]

4. (i) The diagram shows a vertical section of a kidney. [3]



Name the parts as shown in the diagram:

Practical Portion

Marks: 30

1. (a) Why did the scientists choose to incubate the dish at 37°C instead of selecting a higher or lower temperature?

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- (b) Draw a standard animal cell accurately labelling the nucleus, cytoplasm, cell membrane, ribosomes, and mitochondria with a high degree of precision.

[10]

2. (a) Write down technical processes related to observing osmosis under specific conditions, including: (i) thistle funnel experiment, (ii) operating an osmometer, (iii) utilizing visking tubing for water potential, and (iv) investigating osmosis in potato cells.

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(b) Explain the technical procedures for observing chemical tests for starch using iodine.

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