

**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.

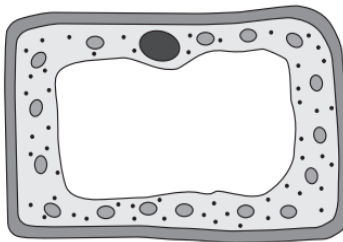
**INFORMATION:**

- 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

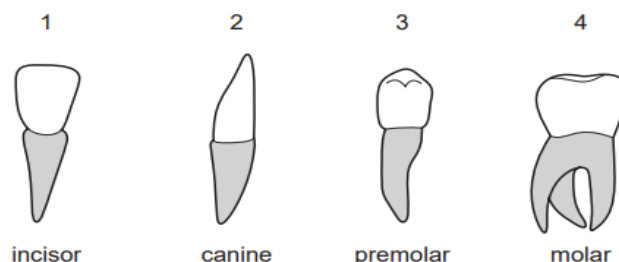
## Objective Section

Marks: 25

1. **What is the reason for oxygen diffusion into the blood from an alveolus in the lungs?**
  - A. Higher oxygen concentration in the alveolus than the carbon dioxide concentration in the blood.
  - B. Higher oxygen concentration in the alveolus than in the blood.
  - C. Higher oxygen concentration in the blood than in the alveolus.
  - D. Higher oxygen concentration in the blood than the carbon dioxide concentration in the alveolus.
2. **The best treatment for persistent diarrhoea is?**
  - A. drinking salt and sugar solution
  - B. drinking pure water
  - C. eating more fibre
  - D. eating protein such as boiled eggs
3. **The breakdown of drugs occurs in which part of the body?**
  - A. brain
  - B. heart
  - C. kidneys
  - D. liver
4. **The plant cell shown in the diagram is a:**



- A. xylem vessel
  - B. phloem vessel
  - C. root hair cell
  - D. leaf palisade cell
5. **Name the type of cell division that is produced by sperm cells.**
  - A. Binary fission
  - B. Differentiation
  - C. Mitosis
  - D. Meiosis
6. **Scientists discovered DNA from a Stone Age woman trapped in a tree gum. The woman had chewed the tree gum. The DNA enabled predictions about some of her traits. Which particular trait would scientists have been able to anticipate from her DNA alone?**
  - A. Body weight
  - B. Eye color
  - C. Diet
  - D. Height
7. **Four types of human teeth are shown in the figure. Which teeth are used for cutting rather than grinding food?**



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

8. How is the scent of a bouquet spread throughout a room?

- A. by conduction
- B. by diffusion
- C. by osmosis
- D. by transpiration

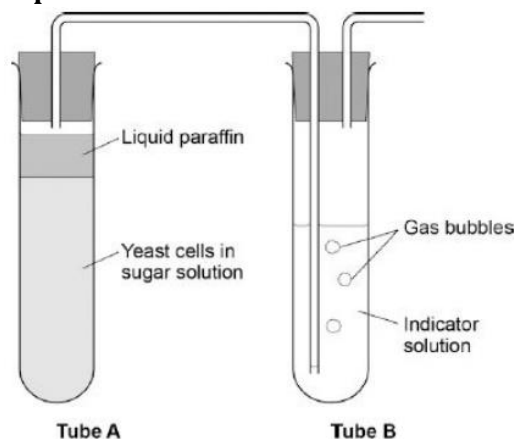
9. Which statement is not correct regarding a woman who has been smoking heavily for many years?

- A. Tar blocked her arteries.
- B. She is addicted to nicotine.
- C. Destruction of cilia in the trachea.
- D. Reduction of the surface area of the lung.

10. Which of these is a feature of an artificial classification system?

- A. It shows evolutionary links between organisms.
- B. It can be based on similarities in DNA.
- C. It may compare the amino acids in proteins.
- D. It uses a single difference or similarity between organisms

11. The diagram below shows an investigation into anaerobic respiration in yeast cells. What is the function of the liquid paraffin in Tube A?



- A. Prevent evaporation
- B. Stop inside air movement
- C. Stop the temperature moving up
- D. Stop outside water movement

12. Heart disease can significantly reduce cardiac output. Cardiac output is the volume of blood leaving the

- A. atrium every heartbeat
- B. atrium every minute

C. ventricle every heartbeat

D. ventricle every minute

**13. How do carbon dioxide and oxygen move into and out of a mesophyll cell?**

A. active transport

C. respiration

B. diffusion

D. transpiration

**14. Which two characteristics of living organisms demonstrate phototropism?**

A. growth and nutrition

C. movement and nutrition

B. growth and sensitivity

D. nutrition and sensitivity

**15. Which structure is not present in a liver cell but present in the root hair cell?**

A. cell wall

C. glycogen granule

B. chloroplast

D. nucleus

**16. Which type of food is absorbed by the body without being digested?**

A. carbohydrate

C. protein

B. fat

D. water

**17. Which process provides the necessary raw materials for tissue repair?**

A. excretion

C. nutrition

B. growth

D. respiration

**18. Which organ is frequently damaged by excessive alcohol consumption?**

A. heart

C. pancreas

B. liver

D. stomach

**19. Cilia are present in the cell surface of the trachea. How does the reduced effectiveness of cilia in smokers as compared to non-smokers, impact the smoker?**

A. Less carbon dioxide is released.

B. Less oxygen is released.

C. More bacteria enter the lungs.

D. More mucus is removed from the lungs.

**20. Approximate percentage of oxygen in expired air is?**

A. 0.04%

C. 16%

B. 4%

D. 21%

**21. Where is urea produced?**

A. Bladder

C. liver

B. kidney

D. urethra

**22. The correct way of naming an organism by using the binomial system is?**

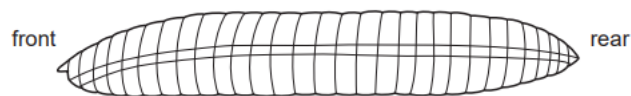
A. *Common buttercup*

B. *ranunculus acris*

C. *Ranunculus acris*

D. *Ranunculus* sp.

**23. The body plan of an invertebrate animal is shown in the figure. Which group does this animal belong to?**



A. annelid

B. crustacean

C. insect

D. nematode

**24. What is the scientific term for the process of transferring a gene from a human cell to a bacterium, which then makes human insulin?**

A. artificial selection

C. heterozygous inheritance

B. genetic engineering

D. natural selection

**25. Which statement describes small molecules as the basic units in the synthesis of large food molecules?**

A. Amino acids are basic units of carbohydrates.

B. Fatty acids are basic units of glycogen.

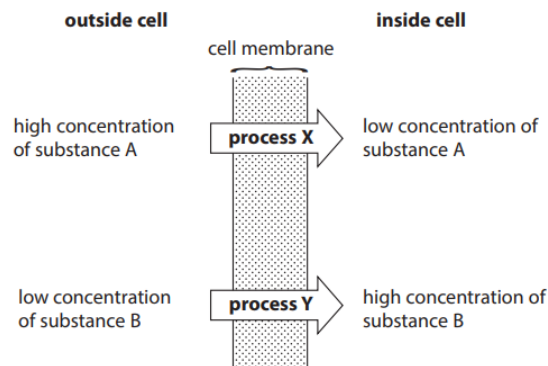
C. Glycerol is a basic unit of oils.

D. Simple sugar is a basic unit of protein.

### THEORETICAL Q/S

**Marks: 45**

**1.** Substances in the soil are absorbed by the root hair cells of plants. The diagram illustrates the movement of two substances A and B across the cell membrane of a root hair cell.



**(i)** Name process X

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..... (1)

**(ii)** Name process Y.

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..... (1)

**(iii)** Root hair cells in plants absorb mineral ions. Identify the type of vessel responsible for transporting these mineral ions throughout the plant.

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..... (2)

**2. (i)** The chromosomes contain the genetic material. Identify the chemical composition of the genetic material.

..... (2)

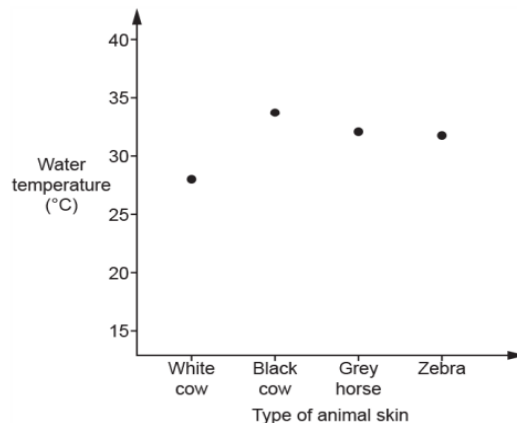
**(ii)** Stem cells are undifferentiated cells that are not specialized for specific functions, e.g. bone marrow cells. Explain how transplanting bone marrow cells help to treat medical ailments.

..... (4)

**(iii)** Wolfram's Syndrome is a genetic disorder, arising from a recessive allele (n). In patients with Wolfram's syndrome, a protein fails to function properly. Explain how a change in an allele can disrupt the proper functioning of the protein.

..... (4)

3. Zebras adapted to hot African grasslands. Scientists tried to find out why zebras have evolved stripes on their bodies. One theory reports that the stripes serve as a cooling mechanism over other colours. To test this theory, scientists wrapped barrels of cold water with the skin of different animals and measured the water temperature several hours later.



- (i) Do the findings in the figure support the theory that stripes help in cooling zebras? Explain your answer.

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- ..... (2)
- (ii) The scientists aimed to investigate whether skin colour alone affects temperature regulation. Suggest one improvement that the scientists implement to ensure they investigate skin colour. Justify your answer.

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- ..... (3)
- (iii) Name the parts labeled A to D



- A. ....
- B. ....
- C. ....

D. .... (2)

4. (i) All living cells undergo respiration, a process that transfers energy from glucose for muscle contraction. Elaborate on how glucose travels from the small intestine to a muscle cell.

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- (ii) Comparison of anaerobic respiration in a yeast cell with anaerobic respiration in a muscle cell.

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..... (5)

- (iii) The diagram shows the human circulatory system.





- (i) State two distinctions in the structure of this yeast cell compared to the structure of a bacterial cell.

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.....(4)

- (ii) Plant cells can produce glucose. Propose a reason why yeast cells are incapable of producing glucose.

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- (iii) Explain the process through which the ovum passes down to the uterus.

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#### **PRACTICAL PORTION**

**Marks: 30**

1. (i) Label the components of the seed. (5)



..... (8)

(ii) Calculate the surface area of a leaf by utilizing grid paper.



.....(5)

(iii) Investigate plant metabolism specifically respiration and photosynthesis by using a hydrogen carbonate indicator under light and dark conditions.

..... (4)