

Biology Question Paper

2004

General Instructions

1. Attempt all questions from Section I and any four questions from Section II.
2. The intended marks for questions or parts of questions are given in brackets.

SECTION I (40 Marks)

Attempt *all* questions from this Section.

Question 1

(a) Name the following: [8]

- i. The type of gene, which in the presence of a contrasting allele, is not expressed.*
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- ii. The vaccine that helps to produce immunity against Polio.
- iii. The canal through which the testes descend into the scrotum just before birth in a human male child.
- iv. The duct which carries urine from the urinary bladder to outside the body.
- v. The bacteria which carries out the process of nitrification.
- vi. The respiratory pigment present in Erythrocytes
- vii. The tissue that transports manufactured starch from the leaves to all parts of the plant.
- viii. The structure where photophosphorylation takes place.

(b) Given below are certain biological statements which are incomplete and hence incorrect. Re-write the correct form of the statement by inserting a suitable word/words at the right place. Do not delete any word already given in the statement. Underline the inserted word/words. [8]

Incorrect (i): fertilisation is the product of egg nucleus and sperm nucleus.

Incorrect (ii): Diapedesis is the process of movement of corpuscles through capillary walls.

Incorrect (iii): Destarching a plant means removing the starch from the plant.

Incorrect (iv): Death-rate is the number of deaths of the given population per year.

Incorrect (v): Residual volume is the volume of air left in the lungs after expiration.

Incorrect (vi): The splitting of water molecules into hydrogen ions and hydroxyl ions is termed photolysis.

Incorrect (vii): Transpiration is the loss of water from the leaves of the plant.

Incorrect (viii): A reflex action is a spontaneous response to a stimulus.

(c) Give one point difference between the following pairs on the basis of what is indicated in brackets. [8]

- i. Cobalt chloride paper and Goat's bladder (process where it is used).
- ii. Rod and Cone cells. (pigment)
- iii. Red blood corpuscles and White blood corpuscles (origin)
- iv. Inspired air and Expired air (% of oxygen).
- v. Cerebrum and Spinal cord (arrangement of cyton and axons of neurons).
- vi. Prostrate gland and Cowper's gland (the nature of secretion).
- vii. Pleura and Pericardium (location).
- viii. Bicuspid valve and Tricuspid valve (place where it is present).

(d) Given below is a table consisting of a set of items belonging to a common category. Complete the table by filling in the CATEGORY and the ODD term. [8]

SET	CATEGORY	ODD TERM
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(i) TAB, BCG, DPT, penicillin.

(ii) Semi-circular canals, Malleus, Cochlea, Utriculus, Sacculus.

(iii) Vacuole, Ribosome, Mitochondria, Centrosome.

(iv) Steroids, Cortisone, Testosterone, Adrenalin, Prolactin.

(e) (1) Given below are sets of terms. In each case, rewrite the terms in the correct order so as to be in logical sequence. One has been done for you. e.g., Urea in blood Collecting tubule, glomerulus distal convoluted tubule, urine. Urea in blood glomerulus, distal convoluted tubule, collecting tubule, urine. [4]

- i. Metaphase, Telophase, Prophase, Anaphase.**
- ii. Pharynx, Trachea, Larynx, Bronchi, Nostril Lung.

- iii. Cortical cell Root hair, Xylem, Water Veins.
- iv. Luteal phase, Follicular phase, Menstrual phase, Ovulatory phase.

(e) (2) State whether the following statements are true or false. Correct and rewrite the false statements by changing either the first word or the last word only. [4]

- i. 'DUP' is the first heart sound.
- ii. Platelets which disintegrate in the injured tissue cells release prothrombin.
- iii. Respiration is a catabolic process.
- iv. Cytokinesis is a division of cytoplasm.**

SECTION II (40 MARKS)

Answer any four questions from this section.

Question 2

(a) Given below is a diagrammatic representation of a certain part of the process of circulation of blood in man. Study the same and then answer the questions that follow: [5]

- i. Name the parts labelled 1, 2, 4 and 6.
- ii. Give the number and name of vessel which contains the maximum amount of urea a few hours after a protein rich meal.
- iii. Draw a neat, labelled diagram of the cross-sectional view of the blood vessel numbered 3.
- iv. Mention two structural difference between blood vessels '3' and '8'.

(b) Briefly describe the following terms and then answer as directed after each: [4]

- i. Antiseptic. Name an antiseptic.
- ii. Biodegradable Pollutants. Name one.
- iii. Ozone hole. When is the International Ozone-Day observed?
- iv. Green House eject. name a phenomenon that is caused due to the green house effect.

Question 3

(a) Study the diagram given below and answer the questions that follow:** [6]

- i. Name the parts labelled I to 6.
- ii. Name the three sub-layers of the epidermis.
- iii. Name the protein found in nails, horns and hair. State its functions.
- iv. Differentiate between Albinism and Leucoderma.

(b) Complete the following table by filling in blank space 1 to 8. [4]

Name of gland	Substance produced	One important function
Islets of Langerhans	1	2.
3	Adrenaline	4
5	Thyroxine	6 8
7	LH	

Question 4

(a) The diagram given below is an experimental set-up demonstrate the production of CO₂ during aerobic respiration in germinating seeds. Study the same and then answer the questions that follow: [6]

- Explain the purpose of placing potassium hydroxide in the conical flask.
- Will the level of water in the delivery tube rise or fall after a few hours? Justify your answer.
- Draw a labelled diagram of the control experiment for the above experiment.
- Represent the process of aerobic respiration in the form of a chemical equation.

(b)

- Name two animals which have nineteen pairs of chromosomes.**
- Differentiate between genotype and phenotype.**
- In a certain species of animals black fur (B) is dominant over brown fur (b). Predict a genotype and phenotype of the offspring when both parents are Bb or have heterozygous black fur.**

Question 5

(a) Given below is a diagrammatic representation of the ventral sectional view of the female reproductive system. [6]

- Redraw the same on your answer sheet and then fill in and label the following parts: 1. Right ovary 2. Uterus 3. Placenta 4. Embryo 5. Amnion 6. Oviducal funnel.
- State the function of the:
 - Placenta
 - Amniotic fluid
- Using the symbol 'X' indicate the region in the diagram where fertilization occurs.
- Differentiate between identical twins and fraternal twins.

(b) [4]

1. Name-
 1. The tube which connects the cavity of the middle ear with the throat. 2. The nerves which transmit impulses from the ear to the brain.
 2. (ii) Differentiate between the following pairs: 1. Diabetes mellitus and Diabetes insipidus. 2. Acromegaly and Myxoedema.

Question 6

(a) Given below is a diagram depicting a defect of the human eye. Study the same and then answer the questions that follow: [6]

- i. Name the defect shown in the diagram.
 - ii. Give two possible reasons for this defect of the eye in human beings.
 - iii. Name the parts labelled 1 to 4.
 - iv. Name the type of lens used to correct this eye defect.
 - v. Draw a labelled diagram to show how the above mentioned defect is rectified using the lens named above.
- (b)
- i. Mention two reasons for the increase of population in India.
 - ii. Write the full form of NADP and ADP.
 - iii. Mention two function of WHO.

Question 7

(a) Give biological reasons for the following: [6]

- i. It is necessary to maintain a normal osmotic concentration of the blood.
- ii. People on reaching high altitude may suffer from unsteady vision, loss of hearing, lack of muscular co-ordination and even complete blackout.
- iii. Salt and sugar are used in preserving food.
- iv. A tiger owes its existence to chlorophyll
- v. Some plants show wilting of their leaves during mid day even when the soil is well watered.
- vi. On sprinkling common salt on grass growing in a lawn, the grass is killed.

(b) [4]

- i. Draw a neat diagram of the stomatal apparatus found in the epidermis of leaves and label the Stoma, Guard cells, Chloroplast, Epidermal cells, Cell wall and Nucleus.
- ii. Complete the following process to show how the oxygen in the air reaches a mesophyll cell of the leaf.