

BIOLOGY

SCIENCE Paper-3

(Two hours)

Answers to this Paper must be written on the paper provided separately.

*You will **not** be allowed to write during the first 15 minutes.*

This time must be spent in reading the Question Paper.

The time given at the head of this Paper is the time allowed for writing the answers.

*Attempt **all** questions from Section I and **any four** questions from Section II.*

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: [5]

- i) The basic unit of nervous system.
- ii) The gland which secretes Adrenocorticotrophic hormone.
- iii) The CO_2 reduction reaction occurring in the stroma of the chloroplast.
- iv) The process of passing out urine from the body.
- v) The pairs of cells surrounding the stomata.

(b) Expand the following biological abbreviations: [5]

- i) ATP
- ii) DNA
- iii) TSH
- iv) ADH
- v) NADP

(c) Choose the correct alternative from the choices given below each statement so as to complete its meaning. [5]

- i) Nearby objects cannot be clearly seen in:
 - (a) myopia
 - (b) hypermetropia
 - (c) astigmatism
 - (d) glaucoma

- ii) Gigantism and Acromegaly are due to:
 - (a) Hyposecretion of Thyroxine
 - (b) Hyposecretion of Growth Hormone
 - (c) Hypersecretion of Thyroxine
 - (d) Hypersecretion of Growth Hormone

- iii) Tricuspid valve is present between:
 - (a) Right atrium and right ventricle
 - (b) Left atrium and left ventricle
 - (c) The two atria
 - (d) The two ventricles

- iv) Guttation occurs through:
 - (a) Protoplasm
 - (b) Hydathodes
 - (c) Lenticels
 - (d) Cuticle

- v) A part of the inner ear:
 - (a) Malleus
 - (b) Vestibule
 - (c) Stapes
 - (d) Incus

(d) State whether the following statements are true or false. If false, rewrite the correct statement by changing the last word only. [5]

- i) Insulin is a hormone produced by pancreas.
- ii) Starch can be tested by iodopsin.
- iii) Malfunctioning of thyroid results in gigantism.
- iv) Haploid daughter cells are a result of Meiosis.
- v) In an event of danger the sympathetic system switches to a mode where the heart beat increases.

e) Rearrange the following in correct sequence pertaining to what is given in the brackets at the end. [5]

- i) Choroid , Sclera, Retina (**Concentric layers of the human eye**)

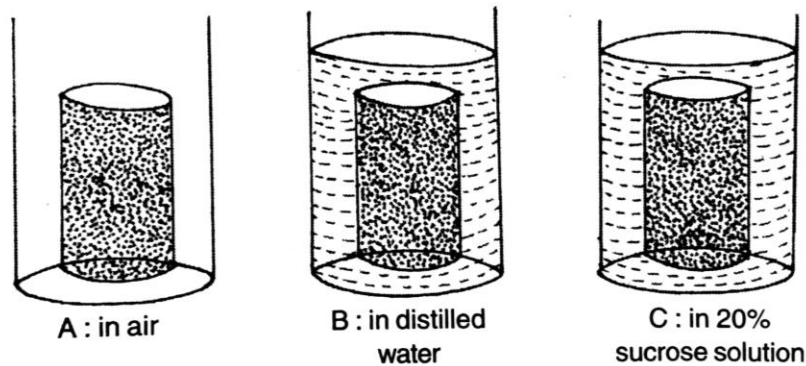
- ii) Water moves from cells at the lower levels, evaporation of water from leaves, Increase in osmotic pressure and concentration of cell sap, absorption of water from the soil by roots (**Transpiration stream**)

- iii) Repolarisation, Depolarisation, Resting (Polarised) (**during conduction of nerve impulse through a nerve fibre**)

- iv) Lungs, Pulmonary artery , Pulmonary veins, Left auricle. (**Pulmonary blood circulation**)

- v) Urinary bladder, Kidneys, Ureter, Urethra (**Flow of Urine**)

f) Three cylinders of potato were carefully dried on a blotting paper and weighed. Each piece weighed three grams. Each piece was then placed in a beaker as shown in the diagram given below. Observe the figure carefully and answer the questions given below: [5]



- i) After 48 hours which potato cylinder would be the heaviest?
- ii) The movement of which substance is mainly responsible for the weight changes in the potato cylinder?
- iii) Name and define the process which is responsible for this movement in the beaker?
- iv) Would there be any difference in the weight of the potato cylinder kept in A after 48 hours? Give a reason to support your answer.

g) Choose the ODD one out from the following terms given and name the CATEGORY to which the remaining three belong: [5]

- i) Nose, Tongue, Arm, Eye
- ii) Lumen, Pericardium, Cardiac muscles, Septum
- iii) Cell wall, Centrosome, Cell membrane, Large vacuoles.
- iv) Dendrites, Medullary Sheath, Axon, Spinal Cord.
- v) Nuclear membrane, Nucleoplasm, Nucleolus, Ribosomes.

h) Match the items given in Column A with the most appropriate ones in Column B and **REWRITE** the correct matching pairs. [5]

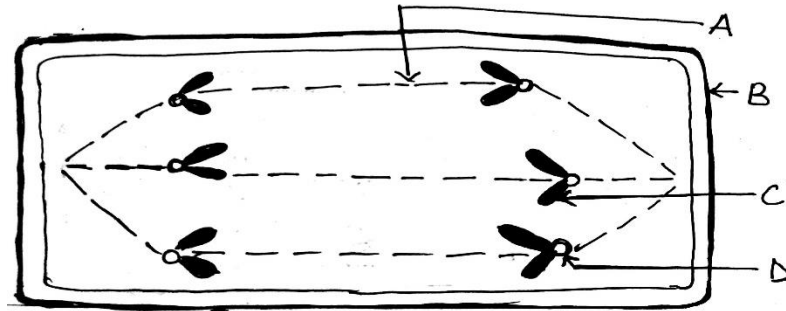
- | Column A | Column B |
|--------------------------------|--------------------|
| i) Sneezing | Defence |
| ii) Lymph | Growth |
| iii) Division of cytoplasm | Karyokinesis |
| iv) Knitting | Natural reflex |
| v) Nuclear membrane disappears | Interphase |
| | Conditioned reflex |
| | Cytokinesis |
| | Prophase |

SECTION II (40 Marks)

Attempt any **four** questions from this Section.

Question 2

- (a) The diagram below represent a stage in cell division. Study the same and answer the questions that follow: [5]



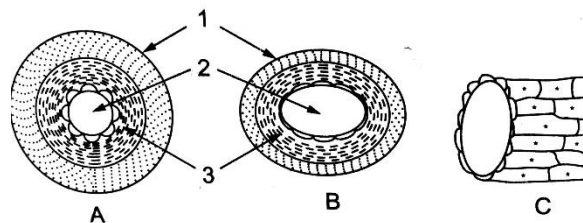
- Identify the stage of cell division by giving a suitable reason.
- Name the parts labelled A,B, C and D.
- Draw a neat, labelled diagram of the stage which happens before the one shown in the diagram.
- How many daughter cells are formed in this type of cell division?
- Name the type of cell division that occurs during:
 - Growth of shoot
 - Formation of pollen grains

- (b) Differentiate between the following pairs on the basis of what is mentioned within brackets: [5]

- Spinal Nerves and Cranial Nerves (Number of Nerves)
- Near Vision and Distant Vision (Shape of the eye balls)
- Cell wall and Cell membrane (Permeability)
- Rods and Cones of Retina (Type of Pigment)
- Blood and Lymph (Composition)

Question 3

- (a) The diagrams given below are cross sections of blood vessels. Observe it carefully and answer the questions that follow: [5]



- Identify the blood vessels A, B and C.
- Name the parts 1, 2 and 3.
- Name the type of blood that flows through A.
- Mention one structural difference between A and B.
- In which of the above vessels does exchange of gases actually take place?

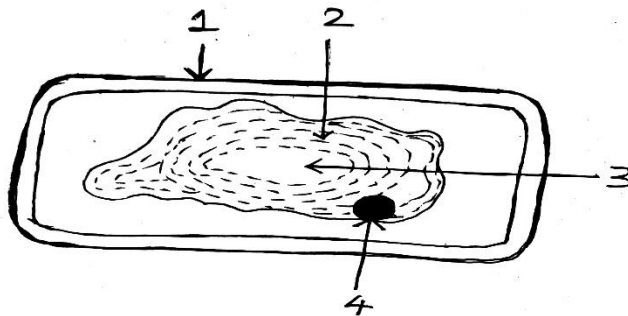
(b) Mention the exact location of the following:

[5]

- i) Thylakoids
- ii) Lacrimal gland
- iii) Monocytes
- iv) Adrenal gland
- v) Pons

Question 4

(a) The figure represents a plant cell after being placed in a strong salt solution. Observe it carefully and answer the questions that follow: [5]



- i) Label parts 1 to 4.
- ii) What is the state of the cell shown in the figure?
- iii) Name the structure which acts a semipermeable membrane.
- iv) If the diagram possessed chloroplasts, where would they be present in the cell?
- v) What will you do to bring these cells back to their original condition?

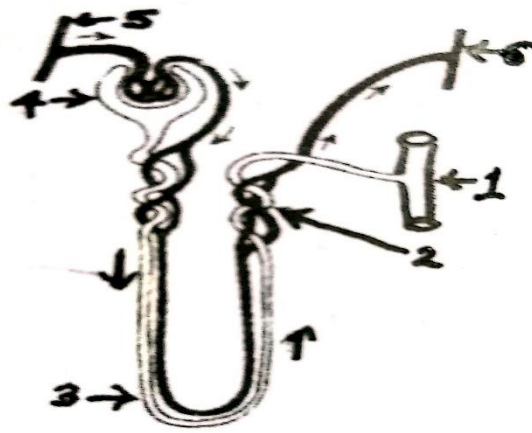
(b) State one function of the following.

[5]

- i) Tears
- ii) Nephron
- iii) Oxytocin
- iv) Hydathodes
- v) Iris

Question 5

(a) The diagram given below represents a nephron and its blood supply. Study the diagram and answer the questions that follow: [5]



- i) Label part 1, 2, 3 and 4.
- ii) State the reason for high hydrostatic pressure in the glomerulus.
- iii) Name the three stages of urine formation.
- iv) Name the parts of the nephron which lie in the cortex of the kidney tubule.

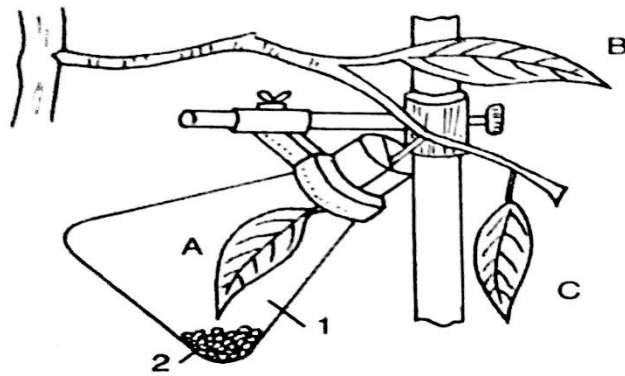
(b) Answer the following questions:

[5]

- i) List the forces contributing to ascent of sap.
- ii) Draw a schematic representation of the path of a reflex arc.
- iii) List four symptoms shown by a person suffering from hyperglycemia.

Question 6

- (a) The figure below represents an experiment performed to demonstrate a particular aspect of photosynthesis. This apparatus was kept in sunlight for almost the whole day. The numeral 1 represents a condition inside the flask and numeral 2 represents a chemical responsible for this condition. Observe it carefully and answer the questions that follows: [5]



- i) What is the aim of the experiment?
- ii) What is the special condition inside the flask?
- iii) What is the chemical substance numbered '2'?
- iv) In what way will the three leaves A, B and C differ at the end of the experiment when tested with iodine solution? What does it indicate?
- v) Name the process which is the reverse of the process of photosynthesis in terms of the end products.

(b) Define the following terms.

[5]

- i) Conditioned reflex
- ii) Urine
- iii) Haemophilia
- iv) Transpiration
- v) Chromosomes