SCIENCE

Paper 3 (Biology)

(One Hour and a half)

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 is to be spent in reading the Question Paper.

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

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*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:-

(i) The organ that produces urea.

(ii) The organization that suggests quarantine measures to prevent the spread of disease.

(iii) The tissue lining the inner part of the cheek of man.

(iv) Mutually beneficial association of two living organisms.

(v) The phase of the cardiac cycle in which the ventricles relax. [5]

(b) Choose the odd one out from each of the following sets, giving the reason for your choice:-

(i) AIDS, Small pox, Diphtheria, Measles.

(ii) Mitral valve, Sino atrial node, Aorta, Pulmonary vein.

(iii) Fat droplet, Glycogen, Cell membrane, Starch.

(iv) Carbolic acid, Mercurochrome, Phenol, Benzoic acid.

(v) Basophils, Neutrophils, Monocytes, Eosinophils. [5]

(c) Complete the following table by filling in the blank spaces numbered 1 to 10:-

Gland	**Secretions**	**Effect on body**
1	Oestrogen	2
Alpha cells of Pancreas	3	4
5	6	Protruding eyes
Lachrymal	7	8
9	10	Gigantism.

[5]

(d) State whether the following statements are *true* or *false*. If *false*, rewrite the correct statement by changing the first or last word only:-

(i) Hormones are secreted directly into the organs.

(ii) Photosynthesis occurs in all the cells of a plant.

(iii) Antibodies are obtained from fungi and bacteria.

(iv) Vasectomy is the surgical method of sterilization in men. [5]

(e) Give the exact location and one function of each of the following structures:-

(i) Meninges

(ii) Lenticels

(iii) Chordae tendinae

(iv) Amnion

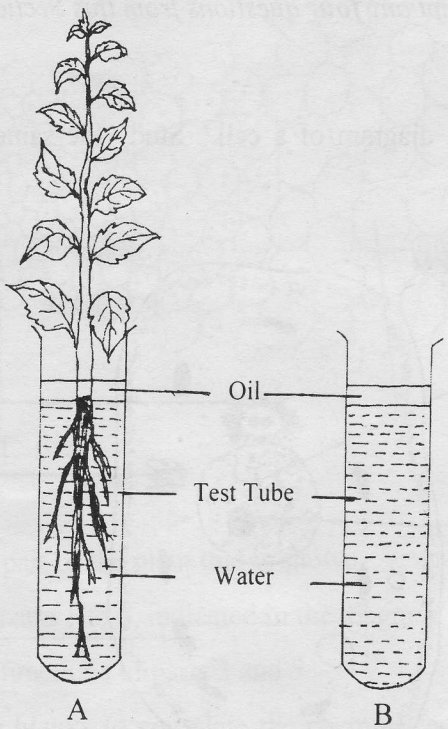
(v) Thylakoids. [5]

(f) Given below in the box are a set of 14 biological terms. Of these, 12 can be paired into 6 matching pairs. Of the six pairs, one has been done for you as an example. Write out the remaining 5 matching pairs made by you as '1 to 5'.

Vein, Kidney, Artery, Androgen, Water Pollutants, Myopia, Leydig cells, Thoracic cavity, Narrow lumen, Lungs, Uriniferous tubule, Pleural cavity, Insecticides, Concave lens.

Example : Myopia — Concave lens. [5]

(g) Study the diagram given below and answer the questions that follow:-



(i) Explain the physiological process being studied.

(ii) What will be observed in the two test tubes after two to three days?

(iii) Give a reason for your answer in (ii) above.

(iv) Why is the surface of water covered with oil?

(v) State the purpose of setting up test tube B. [5]

(h) Given below are five sets of terms. In each case, arrange and re-write each set of terms so as to be in logical sequence:-

(i) Right auricle, Pulmonary vein, Post and Pre Vena Cava, Lungs, Right ventricle, Pulmonary artery, Left auricle.

(ii) Posterior Vena Cava, Renal artery, Aorta, Renal vein, Kidney.

(iii) Dorsal root ganglion, Receptor, Effector, Ventral root ganglion, Associated neuron.

(iv) Graafian follicle, Ostium, Ovum, Uterus, Fallopian tube.

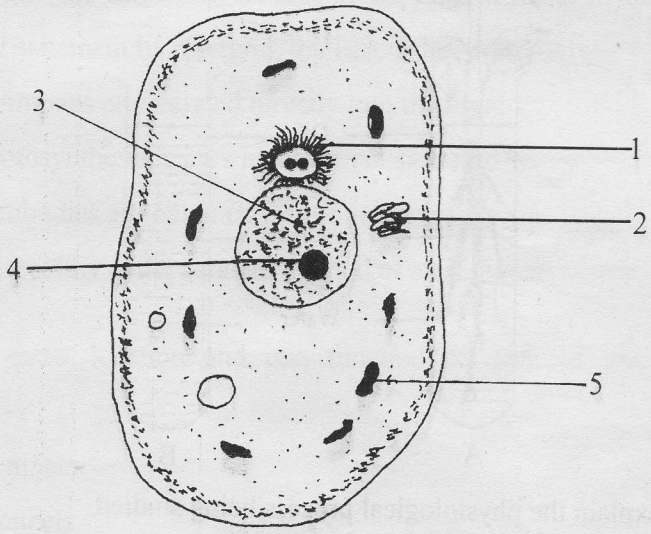
(v) Yellow spot, Conjunctiva, Pupil, Cornea, Lens, Vitreous humour, Aqueous humour. [5]

SECTION II (40 Marks)

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

Question 2

(a) Given below is the diagram of a cell. Study the same and answer the questions that follow:-



(i) Name the parts 1, 2, 3 and 4 indicated by the guidelines.

(ii) State the functions of parts 2 and 4.

(iii) Draw a labelled diagram of the organelle '5' as seen under the electron microscope. [5]

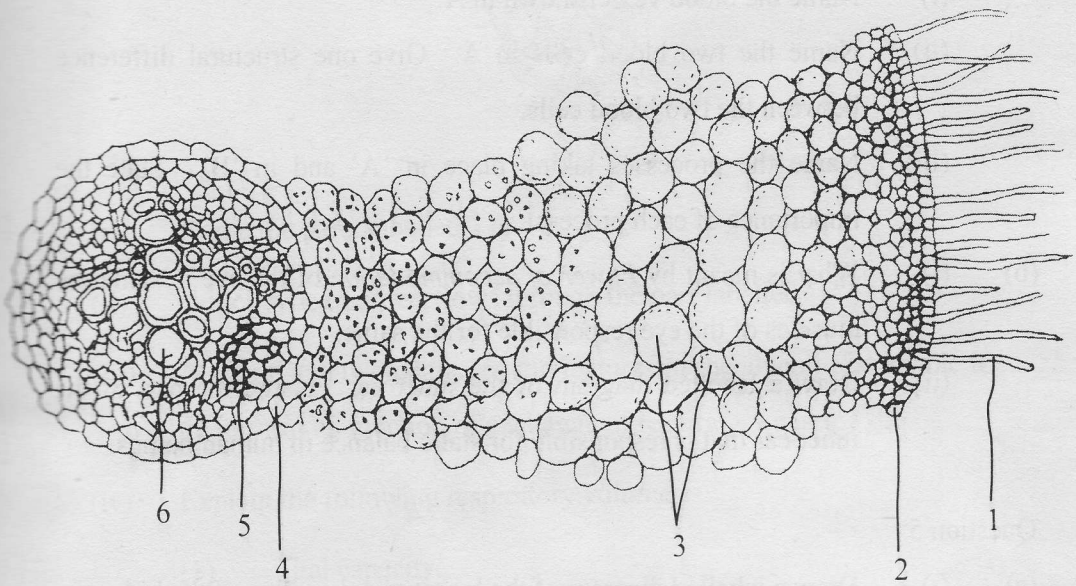
(b) (i) Explain the term *Plasmolysis*. Give one application of this phenomenon in our daily lives.

(ii) Enumerate the steps involved in testing a green leaf for the presence of starch.

(iii) What is Ganong's Potometer used for? Write any two limitations of this apparatus. [5]

Question 3

(a) Given below is the diagrammatic representation of the transverse section of a part of a plant. Study the same and answer the questions that follow:-



(i) Name the part of the plant that is shown.

(ii) Label the parts 1 to 6, indicated in the diagram.

(iii) Write the functions of parts 3 and 5. [5]

(b) (i) Fill in the blanks to complete the chemical equations. Name the process in each case.

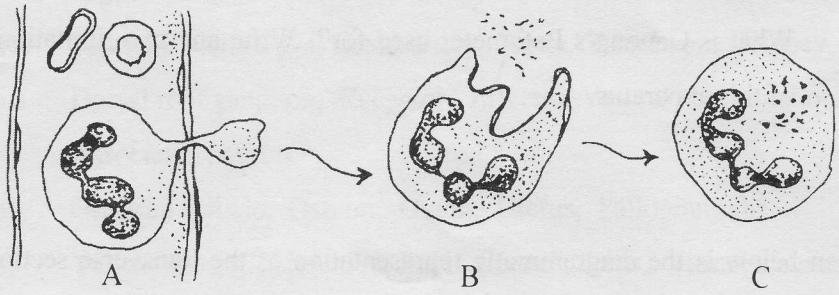
(1) _____ + $6O_2$ → _____ + _____ + 38 A.T.P.

(2) _____ → _____ + _____ + 2 A.T.P.

(ii) State the difference between Anaerobic respiration in plants and in man. [5]

Question 4

(a) Study the figures A, B and C shown below and answer the questions that follow:-



(i) Name the blood vessel shown in A.

(ii) Name the two blood cells in A. Give one structural difference between the two blood cells.

(iii) Name the processes taking place in 'A' and in 'B'. State the importance of each process. [5]

(b) (i) What is meant by *Power of accommodation* of the eye? Name the muscles of the eye responsible for the same.

(ii) Draw a labelled diagram of the inner ear. Name the part of the inner ear that is responsible for static balance in human beings. [5]

Question 5

(a) (i) Draw a labelled diagram of the longitudinal section of the kidney.

(ii) Briefly describe the formation of *Glomerular filtrate*.

(iii) Explain the term *Osmoregulation*. [5]

(b) Give one point of difference between the following pairs on the basis of what is indicated in brackets:-

(i) Ribosome and Mitochondria (function).

(ii) Medulla oblongata and Cerebellum (function).

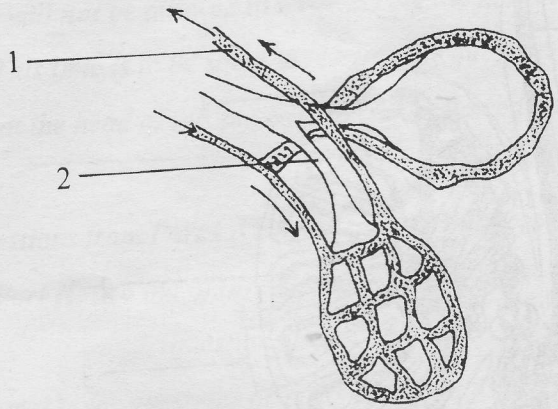
(iii) Implantation and Gestation (definition).

(iv) Open and closed Vascular bundle (structure).

(v) Isobilateral leaf and Dorsiventral leaf (type of venation). [5]

Question 6

(a) Given below is a diagrammatic representation of the alveoli and its capillary network:-



(i) Name the parts labelled 1 and 2.

(ii) Which type of blood flows through the part labelled '1'?

(iii) Mention any two characteristic features of the alveoli that enable it to perform its function of exchange of respiratory gases.

(iv) Explain the following respiratory volumes:-

(1) Vital capacity.

(2) Inspiratory Reserve Volume. [5]

(b) (i) Draw a labelled diagram of a myelinated neuron.

(ii) Explain the difference between a *sensory nerve* and a *motor nerve*.

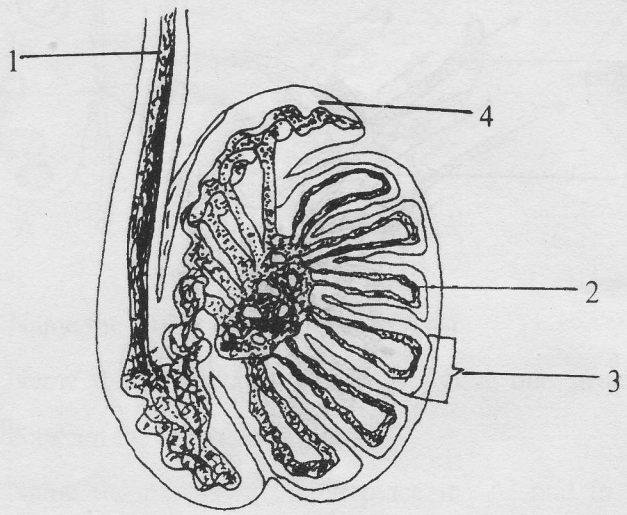
(iii) Differentiate between:-

(1) Nitrogen fixation and Nitrification.

(2) Passive Immunity and Active Immunity. [5]

Question 7

(a) The diagram shown below is the lateral Section of a testis of man. Study it carefully and answer the questions that follow:-



(i) Label the parts 1 to 4 of the diagram.

(ii) State the functions of the parts labelled 1 and 2.

(iii) Draw a labelled diagram of a sperm. [5]

(b) Give biological reasons for the following:-

(i) On a bright sunny day the leaves of certain plants roll up.

(ii) Marine fish burst when thrown under tap water.

(iii) The blood in the arteries flows in spurts.

(iv) It is advisable to breathe through the nose and not through the mouth.

(v) People living in hilly regions usually suffer from simple goitre. [5]

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