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) One combined vaccine given to babies which helps build immunity against three common diseases.

(ii) The structure responsible for preventing the trachea from collapsing.

(iii) The hormone that releases glucose into the blood.

(iv) The eye defect caused due to the shortening of the eyeball from front to back.

(v) The chemical substance that causes muscle fatigue. [5]

(b) State whether the following statements are *true* or *false*. If *false*, write the correct statement by changing the **first word only**.

(i) Respiration is the only biological process in which oxygen is produced.

(ii) Oxygen is the energy currency of a living cell.

(iii) Iron is the mineral element responsible for the clotting of blood.

(iv) Cones are photoreceptor cells that are sensitive to dim light.

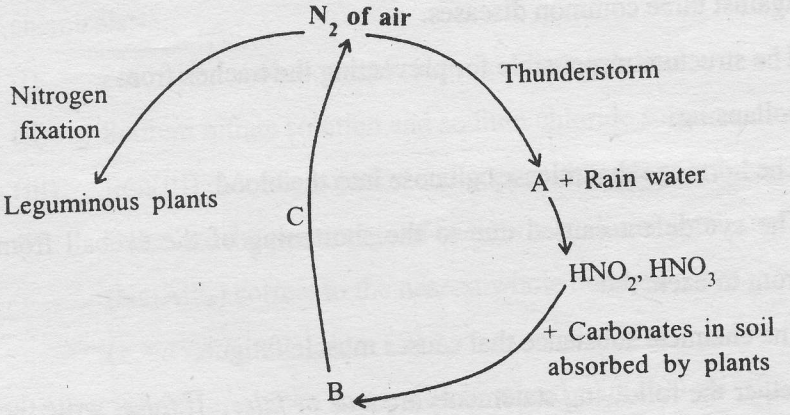
(v) Testosterone is an androgen. [5]

(c) Given below are six sets, with four terms each. In each set, one term is odd and cannot be grouped into the category to which the other three belong. Identify the odd one in each set and name the category to which the remaining three belong. The first one has been done for you as an example.

Set	Odd one	Category
Eg. Fructose, Sucrose, Glucose, Calcium	Calcium	Carbohydrate
(i) Golgi bodies, Leucoplast, Nucleolus, Cambium		
(ii) Chlorenchyma, Cartilage, Parenchyma, Collenchyma		
(iii) Goitre, Dwarfism, Acromegaly, Cataract		
(iv) Sneezing, Coughing, Typing, Blinking		
(v) ADH, TSH, NADP, ACTH		

[5]

(d) Given below is a diagrammatic representation of the *Nitrogen cycle* in nature. Study the same and answer the questions that follow:-



(i) Name the compound A that is formed during a thunderstorm.

(ii) Name the compound B that is released in the soil by the decay of plants.

(iii) Name the process C that is responsible for B being converted back to nitrogen.

(iv) What are *nitrifying bacteria*?

(v) State the role played by *leguminous plants* in the Nitrogen cycle. [5]

(a) Given below in the box are a set of 12 biological terms which can be matched into 6 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".

Thyroid, Alveoli, Adrenal medulla, Lungs, Nephron, Chlorophyll, Thyroxin, Gardenpea, Adrenalin, Thylakoids, Rhizobium, Kidney.

[5]

Example: Nephron – Kidney.

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

(i) Stroma

(ii) Seminiferous tubules

(iii) Apical meristem

(iv) Pinna

(v) Epidermis of plants. [5]

(c) Given below are five groups of terms. In each group, arrange and rewrite the terms in the correct order so as to be in a logical sequence. An example has been done for you:-

eg. Penis, testis, sperm duct, sperm, semen.

Answer: Testis → sperm → sperm duct → semen → penis.

(i) Ear ossicles, oval window, tympanum, auditory canal, cochlea.

(ii) Tissue fluid, oxygen, alveolus, blood, tissues.

(iii) Implantation, fertilization, ovulation, gestation.

(iv) Aorta, hepatic vein, hepatic portal vein, stomach, liver.

(v) Endodermis, root hair, xylem, soil water, cells of cortex. [5]

(d) Explain the following terms:-

(i) Population density

(ii) Bleeding

(iii) Pulse rate

(iv) Phenolysis

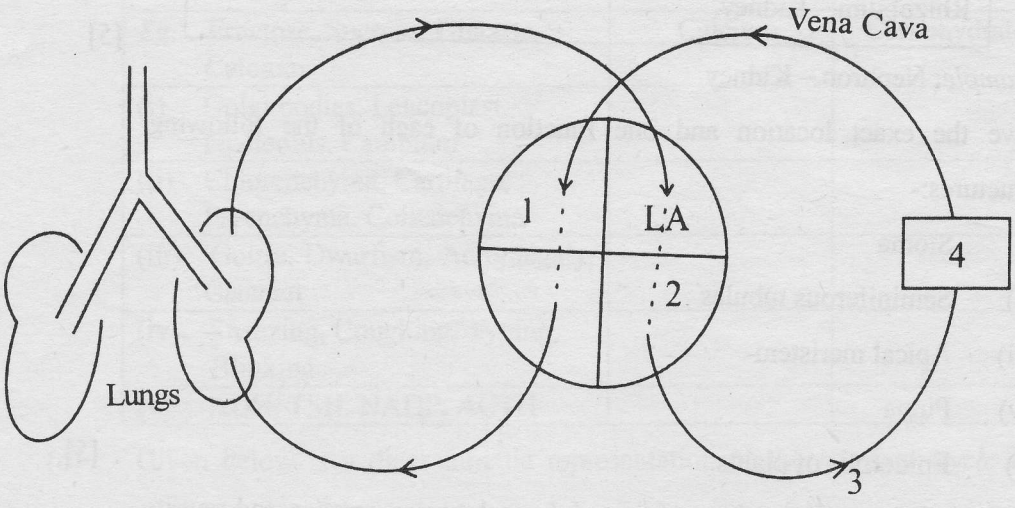
(v) Birth rate. [5]

SECTION II (40 Marks)

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

Question 2

(a) Given below is a schematic representation of the circulatory system in man. Study the same and answer the questions that follow:-



(i) Label the parts 1 to 4 indicated in the diagram.

(ii) Give one difference between the parts 1 and 2 based on:-

(1) their structure

(2) the nature of blood flowing through them.

(iii) What is the specific name of the type of blood circulation that takes place between the heart and the lungs?

(iv) Name the valve found at the beginning of the part labelled 3. [5]

(b) Differentiate between the following pairs on the basis of what is given in brackets:-

(i) Choroid and Sclerotic layers of the eye (Function)

(ii) Lymphocytes and Neutrophils (Structure of the nucleus)

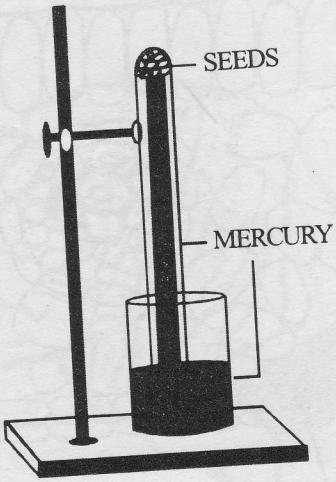
(iii) Dynamic Balance and Static Balance (Definition)

(iv) Beginning of the ventricular systole and the ventricular diastole (Type of heart sound)

(v) Plasma and Serum (Composition) [5]

Question 3

(a) Given below is an experimental set up to demonstrate a particular process using germinating seeds. Study the same and answer the questions that follow:-



(i) Name the process being studied.

(ii) What will be observed in the set up after two to three days? Give a reason for your answer.

(iii) Name the gas evolved during the above process. How will you test this gas?

(iv) Represent the above process in the form of a well balanced chemical equation. [5]

(b) Define the following terms:-

(i) Hypotonic solution

(ii) Nonbiodegradable

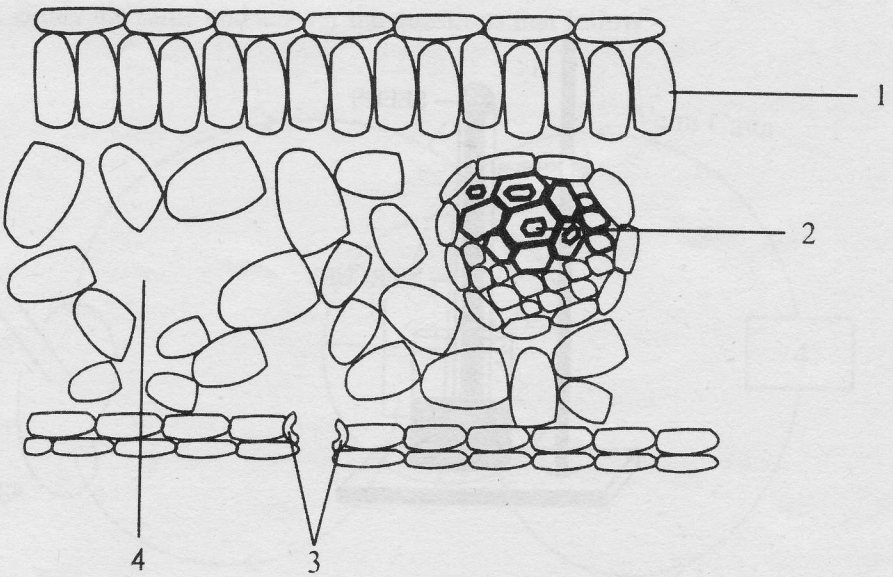
(iii) Antitoxin

(iv) Asphyxiation

(v) Diapedesis. [5]

Question 4

(a) The diagram given below shows the internal structure of the lamina and midrib of a leaf. Study the same and answer the questions that follow:-



(i) Is the above section that of an isobilateral or dorsiventral leaf? Give a reason to support your answer.

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

(iii) What is the function of the part labelled 3?

(iv) Explain how part 3 performs the function mentioned by you. [5]

(b) Answer the following briefly:-

(i) Mention two functions of the World Health Organization.

(ii) Explain the following terms:-

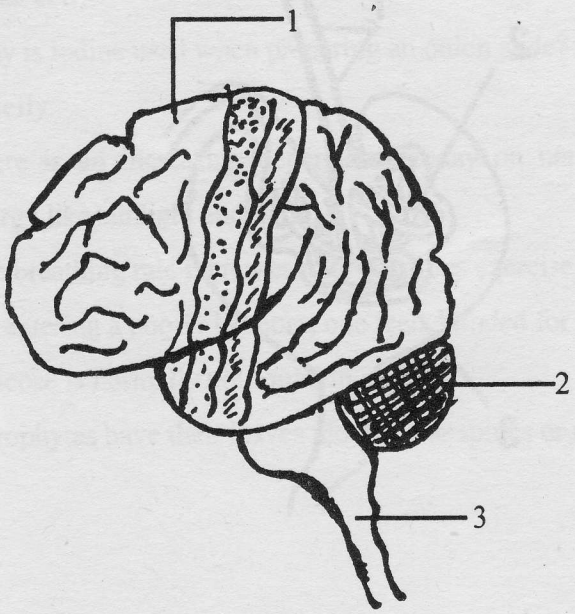
(1) Immunity

(2) Acid rain.

(iii) Define the term *Antibiotic*. Give an example of an antibiotic. [5]

Question 5

(a) The diagram given below is the external view of the human brain. Study the same and answer the questions that follow:-



(i) Name the parts labelled 1,2 and 3.

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

(iii) How are the brain cells arranged in the part labelled '1'? [5]

(iv) What is the structural and functional unit of the nervous system?

(v) Name the fluid that surrounds the brain. State its function. [5]

(b) Give the appropriate terms for the following:-

(i) The arrangement of xylem tissue in a vascular bundle such that the protoxylem is at the centre and the metaxylem is towards the periphery. [5]

(ii) The region of distinct vision in the eye.

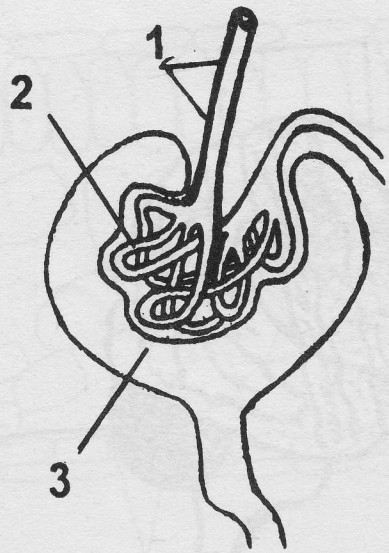
(iii) The surgical method of sterilization in the human female.

(iv) The carbohydrate molecule found in the cell wall.

(v) The process by which cells engulf pathogens. . [5]

Question 6

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



(i) Name the parts labelled 1, 2 and 3.

(ii) What is the collective term used for 2 and 3?

(iii) Why is the right kidney at a slightly lower level than the left?

(iv) Explain the term *homeostasis*. What is the role of the kidney in this? [5]

(b) Given below are groups of terms. In each group the first pair indicates the type of relationship that exists between the terms. Rewrite and complete the second pair on a similar basis. An example is done for you.

Example: Lung : Respiration – Kidney : Excretion

(i) Uterus: Implantation – Fallopian tube: _____.

(ii) Eye: Optic nerve – Ear: _____.

(iii) Trachea : Ciliated epithelium – Sclerenchyma: _____.

(iv) RNA : Ribosome – Cristae : ——.

(v) Ureter : Carrying urine – Eustachian tube: _____. [5]

Question 7

(a) (i) Draw the microscopic view of an onion peel and label the three basic parts of the cell in it.

(ii) How is the above mentioned cell structurally different from the cheek cell?

(iii) Why is iodine used when preparing an onion slide? [5]

(b) Explain briefly:-

(i) There is an increasing dependence today on natural sources of energy like sunlight and wind.

(ii) The breathing rate increases after vigorous exercise.

(iii) On entering a poorly lit room, one feels blinded for a short while.

(iv) Glucose is normally not found in urine.

(v) Xerophytes have their leaves modified to spines or reduced in size. [5]

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