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ICSE Paper 2005

BIOLOGY

SECTION—I (40 Marks)

*(Compulsory : Answer **all** parts 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'.*

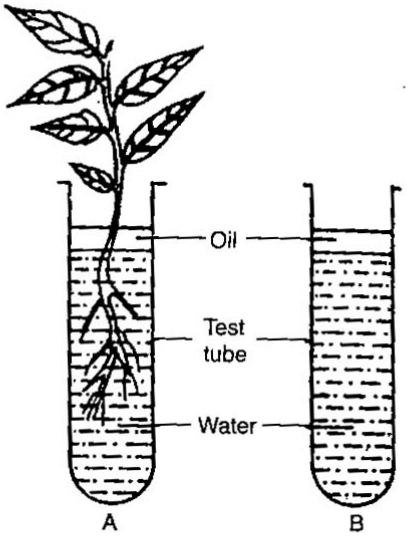
** *Answer has not given due to out of present syllabus.*

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

[5]

***Example :** Myopia—Concave lens.*

(g) *Study the diagram given alongside 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 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]**

Answer :

(a) (i) Liver (ii) WHO (iii) Ventricular diastole

(b)

	Odd one	**Reason**
(i)	Diptheria	others are Viral diseases.
(ii)	Sinoatrial node	others are at left side of heart.
(iv)	Phenol	others are antiseptic.
(v)	Monocytes	others are granular leucocytes

(c)

Gland	***Secretions***	***Effect on body***
1. **ovary**	Oestrogen	2. **production of egg**
Alpha cells of pancreas	3. **glucagone**	4. **increase blood sugar level**
5. **Thyroid**	6. **Thyroxin**	Protruding eyes
Lachrymal	7. **Tears**	8. **Washes ust particles and kills germs**
9 **Pituitary**	10. **Growth hormone**	Gigantism.

** *Answer has not given due to out of present syllabus.*

(d) (i) False. Enzymes are secreted directly into the organs or Hormones are secreted directly into the blood.

(ii) False. Respiration occurs in all the cells of plant.

(iii) False. Antibiotics are produced from fungi and bacteria.

(iv) True

(e) (i) **Meninges :**
Location — Covers brain and spinal cord.
Function — Protection to the brain and spinal cord.

(ii) **Lenticels :**
Location — on older stems.
Function — exchange of gases.

(iii) **Chordae tendinae :**
Location — On the inner surface of the ventricles.
Function — Prevent valves to be pushed into auricles.

(iv) **Amnion :**
Location — around the embryo.
Function — protects the developing embryo.

(v) **Thylakoids :**
Location — Inside chloroplast.
Function — To trap solar energy.

(f) (i) Androgen — Leydig cells.

(ii) Artery — Narrow Lumen

(iii) Kidney — Uriniferous tubule

(iv) Water Pollutants — Insecticides.

(g) (i) The physiological process being studied is transpirations. To show the loss of water absorbed by the plant root due to transpiration.

(ii) The observation after about 2-3 days will be that the level of water in test tube A has gone down to a greater extent, but in test tube B the level of water remains the same.

(iii) The water in test-tube A was absorbed by roots and through xylem vessels it has reached the leaves. The transpiration is responsible to lose water through the leaves.
Therefore, the level of water in test-tube A falls down. In test-tube B, there is no plant fixed on it. Therefore, transpiration has not taken place. Therefore, the level of water remains the same.

(iv) Oil has been put in each test-tube to prevent the loss of water due to evaporation.

(v) Test-tube B is set up as control the experiment and show that water is absorbed by roots and transpired by a plant in the test-tube A.

(h) (i) Post and Pre vena cava → Right auricle → Right ventricle → pulmonary artery → Lungs → Pulmonary veins → Left auricle.

(ii) Aorta → Renal artery → Kidney → Renal vein → Posterior vena cava.

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

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

(v) Conjunctiva, Cornea, Aqueous humour, Pupil, Lens, Vitreous humour.

SECTION II (40 Marks)

*(Attempt any **four** questions from this section.)*

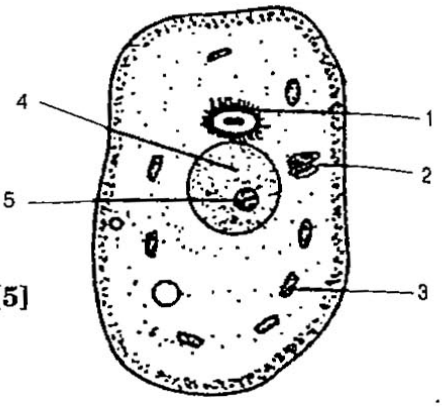
Question 2.

(a) *Given alongside 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]**

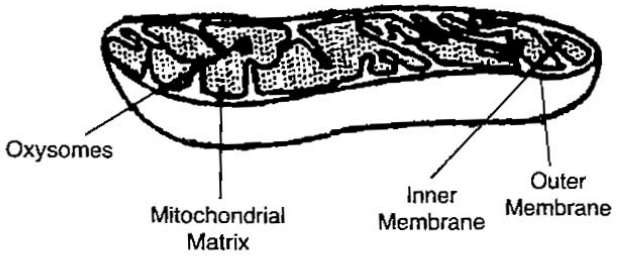
Answer :

(a) (i) (1) Centrosome (2) Golgi apparatus
(3) Chromatin fibers (4) Nucleolus

(ii) (1) **Golgi apparatus :** Synthesis and secretion of enzymes and hormones.

(2) **Nucleolus :** Participates in protein synthesis by forming and storing RNA.

(iii)



(b) (i) **Plasmolysis**—If the cell is kept in a hypertonic solution, it will lose its distended appearance, the cytoplasm will shrink and the plasma membrane will withdraw from the cell wall. This shrinkage from cell wall is called plasmolysis.

Vegetables can be preserved during pickling by adding salt.

(ii) **Steps for starch test :**

(a) Dip the leaf in boiling water for a minute to kill the cells.

(b) Boil the leaf in methylated spirit over a water bath till it becomes pale white due to the removal of chlorophyll.

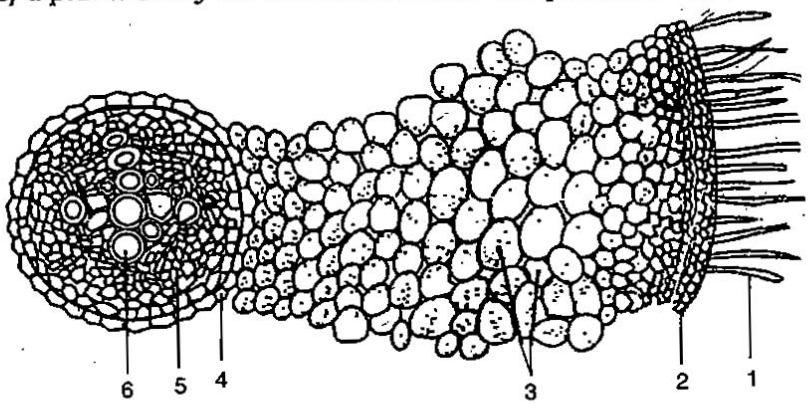
(c) Place it again in hot water to soften it.

(d) Spread the leaf in a dish and pour iodine solution on it. Presence of starch will be indicated by the blue black colour. A leaf without starch will show brown colouration.

(iii) Ganong's Potometer is used to measure the rate of transpiration.
Limitations : (a) Introducting the air bubble is not very easy. (b) The twig may not remain fully alive for a long time.

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]**

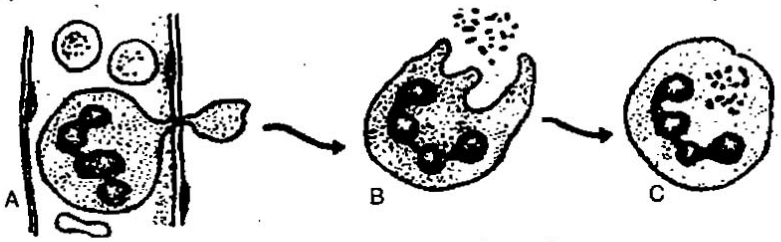
(b) (i) *Fill in the blanks to complete the chemical equations. Name the process in each case*** :
(1) .....+ $6O_2$ → ..... + 38 *A.T.P.*
(2) ..... → ..... + ... + 2 *A.T.P.*
(ii) *State the difference between Anaerobic respiration in plants and in man.* **[5]**

Answer :

(a) (i) Internal structure of a root.
(ii) 1. Root hair, 2. Epiblema, 3. Cortex (parenchyma], 4. Endodermis, 5. Phloem, 6. Xylem.
(iii) Part 3 (cortex)—The cells of the cortex store food and also conduct water from epiblema to the inner tissues.
Part 5 (Phloem)—Phloem transports organic food inside the body of the plant.

Question 4.

(a) *Study the figures A, B and C shown below and answer the questions that follow :* **[5]**



** *Answer has not given due to out of present syllabus.*

(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.*

(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]**

Answer :

(a) (i) Capillaries.

(ii) RBC and WBC. One structural difference between RBC and WBC is RBC are biconcave in shape and WBC are amoeboid in shape.

(iii) A—Diapedesis

B—Phagocytosis.

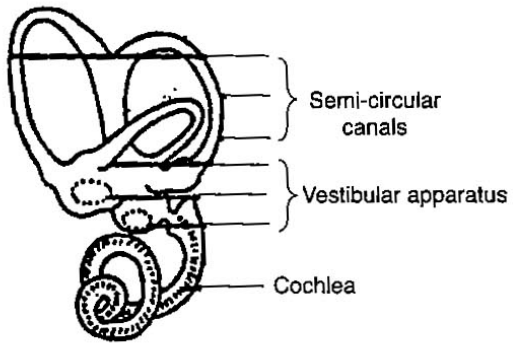
Importance :

Diapedesis—WBC squeeze of the walls of capillaries.

Phagocytosis—WBC engulf bacteria.

(b) (i) **Power of accomodation of eye**—By changing the curvature of the elastic lens the image of objects of different distance is sharp focussed. Ciliary muscles are responsible for accomodation of eye.

(ii)



Parts responsible for static balance is utricules and sacculus.

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).*

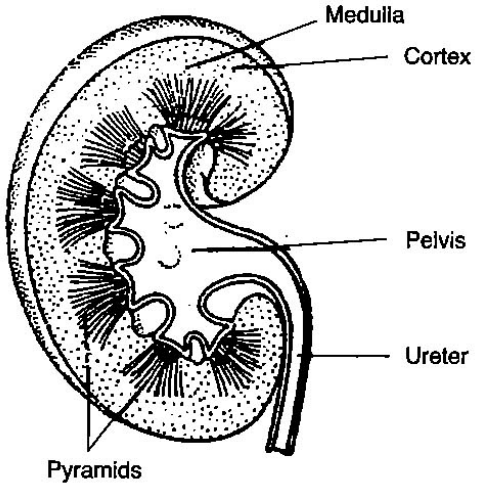
(iv) *Open and closed Vascular bundle (structure).*

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

** *Answer has not given due to out of present syllabus.*

Answer :

(a) (i) Labelled Diagram :



(ii) During ultrafilteration almost all the liquid part of the blood comes out of the glomerulus and passes into the funnel-shaped cavity of Bowmain's capsule. The fluid entering the renal tubule is called glomerular fiterate which contains water, urea, salts, glucose and other plasma solutes.

(iii) The kidney while removing wastes like urea from the blood also regulates its compo-sition. The per-centage of water and salts. This function is called *Osmoregulation*. It helps in regulation of osmotic pressure of the blood.

(b) (i)

Ribosomes	**Mitochondria**
Protein synthesis	To produce and store energy.

(ii)

Medulla Oblongata	**Cerebellum**
Control the activities of the internal organs.	Maintain the body balance.

(iii)

Implantation	**Gestation**
The attachment of the blastocyst to the inner lining of uterus (endometrium).	The period of interauterine foetal development. The full term development of embryo in the uterus is called Gestation.

(iv)

Open Vascular Bundle	**Closed Vascular Bundle**
Cambium is present between xylem and phloem.	Cambium is absent between xylem and phloem.

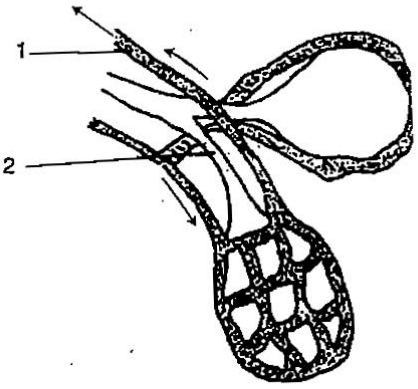
Question 6.

(a) *Given figure is a diagrammatic representation of the alveoli and its capillary network* : **[5]**

(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.*

(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.***

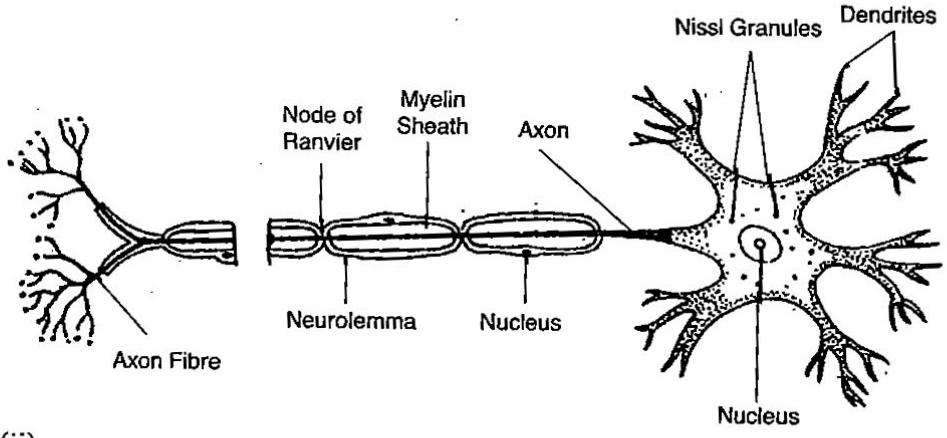
(2) *Passive Immunity and Active Immunity.*

Answer :

(a) (i) 1. Plumonary vein, 2. Pulmonary artery.

(ii) Oxygenated blood.

(b) (i)



(ii)

Sensory Nerve	Motor Nerve
(1) It brings the impulse form receptor to brain or spinal cord.	(1) It brings the impulse from brain or spinal cord to effector.
(2) It contains sensory fibres.	(2) It contains only motor fibers.

(iii) (2)

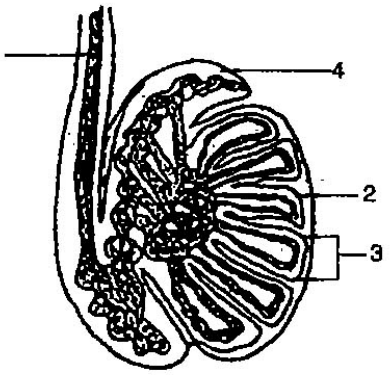
Passive Immunity	Active Immunity
1. Produced by one's own body.	1. Received from outside, *i.e.*, not developed by one's own body.
2. Induced by infection or by contact with immunogens	2. Provided by readymade anti-bodies.

** *Answer has not given due to out of present syllabus.*

(immunity-producing agents such as vaccines, allergens, etc.)	
3. Provides effective and long-lasting protection.	3. Protection is less effective and does not ensure against a sub-sequent infection.
4. Immunity effective only after a certain time gap (time required for production of antibodies)	4. Immediately effective.

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]**

Answer :

a) (i) (1) Vas deferens (2) Seminiferous tubules
(3) Lobule/segment (4) Epididymis.

(ii) (1) **Vas deferens :** It passes the sperms from testis to penis.

(2) **Seminiferous Tubules :** Spermetogensis takes place in it and production of sperms takes place here.

(iii) Refer **Ans. 4. (a) (v), 2008**

b) (i) **Due to transpiration on a bright sunny day :** The cells of the leaves loss water and thus cells loses their turgidity and so the leaves roll up.

(ii) **Marine fish burst when thrown under tap water :** Because its cells exist best in hypertonic solution of salty water, which when put in tap water or isotonic solution—show endosmosis and thus the cells show turgidity and fish bursts.

(iii) The arteries do not have valves which can prevent the back flow of blood.

(v) People living in hilly region usually suffer from simple goitre because iodine is deficient in soil and hence in the food grown there.

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