ICSE Question Paper (2006)

BIOLOGY

SECTION—I (40 Marks)

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

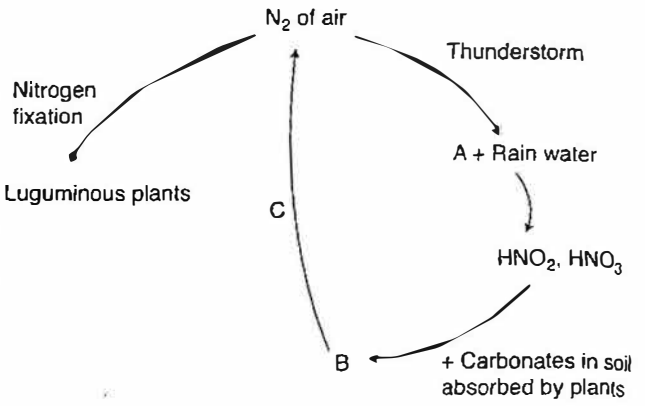
(v) *Testosterone is an androgen.* **[5]**

(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)	*Golgibodies, 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 alongside 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 respon-sible 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]**

(e) *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.*

Example : Nephron—Kidney. **[5]**

(f) *Give the exact location and one function of each of the following structures :*

(i) *Stoma* (ii) *Seminiferous tubules*

(iii) *Apical meristem*** (iv) *Pinna*

(v) *Epidermis of plants.*** **[5]**

(g) *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 :*

e.g., 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]**

(h) *Explain the following terms :*

(i) *Population density* (ii) *Bleeding* (iii) *Pulse rate*

(iv) *Photolysis* (v) *Birth rate.*

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

Answer :

(a) (i) DPT—Vaccine (Diptheria, Pertussis and Tetanus)

(iii) Glucagon

(iv) Hypermetropia

(b) (ii) False. **ATP** is the energy currency of a living cell.

(iii) False. **Calcium** is the mineral element responsible for the clotting of blood.

(iv) False. **Rod cells** are photoreceptor cells that are sensitive to dim light.

(v) True.

(c)

	Set	*Odd one*	*Category*
(iii)	*Goitre, Dwarfism, Acromegaly, Cataract*	**Cataract**	**Hormonal diseases**
(iv)	*Sneezing, Coughing, Typing, Blinking*	**Typing**	**Simple reflex**
(v)	*ADH, TSH, NADP, ACTH*	**NADP**	**Hormones**

(e) (1) Thyroid—Thyroxin (2) Adrenal Medulla—Adrenalin

(3) Chlorophyll—Thylakoids (4) Gardenpea—Rhizobium

(f) (i) Stoma : *Location*— Epidermis of leaf
: *Function*—Transpiration

(ii) Seminiferous tubules : *Location*—Testis
: *Function*—Produce sperms

(iv) Pinna : *Location*—External ear
: *Function*—Collect sound waves

(g) (i) Auditory canal → tympanum → ear ossicles → oval window → cochlea.

(ii) Alveolus → oxygen → blood → tissue fluid → tissue.

(iii) Ovulation → fertilization → implantation → gestation

(iv) Stomach → hepatic portal vein → liver → hepatic vein.

(v) Soil water → root hair → cells of cortex → endodermis → xylem.

(h) (i) **Population density :** The sum total of individuals in a given geographic region at a specified period is known as the population density. It is the number of individuals in as unit area, such as per square kilometre.

(ii) **Bleeding :** The rapid flow of blood due to cut or injury is called bleeding.

(iii) **Pulse Rate :** It is the alternate expansion and elastic recoil of the wall of the artery during ventricular systole.

(iv) **Photolysis :** Photolysis is the light reaction of photosynthesis. In this process, the energy present in sun light is absorbed by the chlorophyll and is used to split the water molecules into hydrogen and oxygen.

(v) **Birth rate :** It is the number of children born per 1000 living person per year.

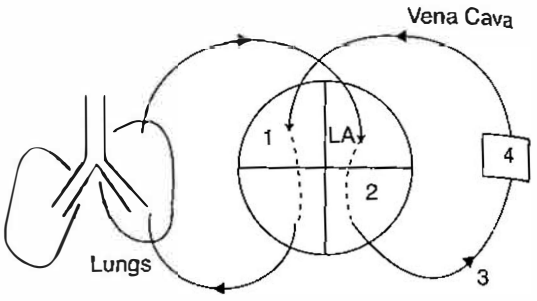
$$\text{Birth Rate} = \frac{\text{No. of live birth in a year}}{\text{Population in the middle of the year}} \times 1000$$

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]**

Answer :

(a) (i) 1. Right auricle, 2. Left ventricle, 3. Aorta, 4. Body organ.

(ii)

	Part – 1 (Right auricle)	**Part – 2 (Left ventricle)**
1. Structure	Thinner walls	Thick muscular walls.
2. Nature of blood flowing through them.	Deoxygenated blood	Oxygenated blood

(iii) The specific name is double circulation.

(iv) Aortic semilunar valves.

(b) (i) Difference between Choroid and Sclerotic layers of the eye :

Choroid layer	**Sclerotic layer**
Through its blood supply, it nourishes retina.	Gives shape to the eyeball.

(ii) Difference between Lymphocytes and Neutrophils :

Lymphocytes	**Neutrophils**
Single large nucleus	Nucleus with 3-4 lobes

(iii) Difference between Dynamic balance and Static balance :

Dynamic balance	Static balance
The balance which is achieved by the stimulation of endolymph present in the semi-circular canals is called dynamic balance.	The balance which is achieved through the gravity receptors located in the utriculus and sacculus is called static balance.

(iv) Difference between Ventricular systole and Ventricular diastole :

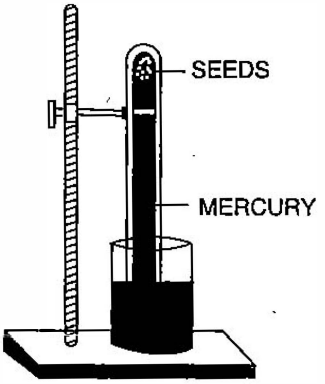
Ventricular systole	Ventricular Diastole
Heart sound produced is 'Lubb'.	Heart sound produced is 'Dup'.

(v) Difference between Plasma and Serum :

Plasma	Serum
It is blood excluding blood corpuscles and platelets.	It is blood plasma excluding fibrin.

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]**

Answer :

(b) (i) **Hypotonic solution**—It is the solution in which the outside cell has lower concentration and lower osmotic pressure than the cell sap.

(ii) **Non-biodegradable—**The waste which cannot be brought into reuse by the process of recycling is called non-biodegradable.

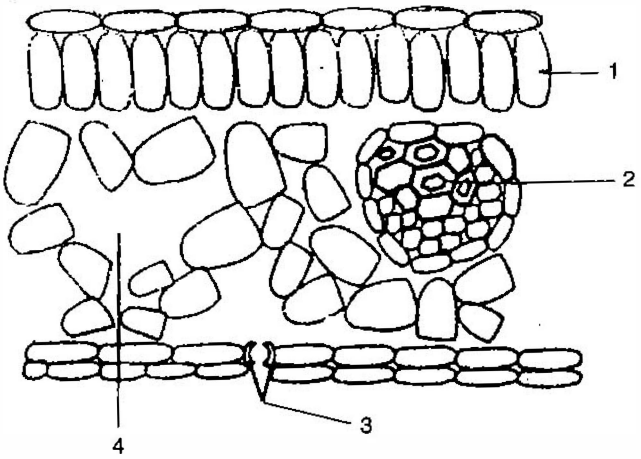
(iii) **Antitoxin**—These are antibodies which are capable of interacting with corresponding toxins and neutralizing them.

(v) **Diapedesis—**The process in which the Leucocytes or white blood cells squeeze out through the walls of blood capillaries of the site of injury to fight against pathogens.

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*** :

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



(i) *Is the above section that of an isobilateral or dorsiventral leaf ? Give 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]

Answer :

(b) (i) **Two Functions of WHO :**

(1) To promote projects for research on diseases.

(2) To lay pharmaceutical standards for important drugs.

(ii) (1) **Immunity**—It is the ability of a person to resist the danger from a particular disease causing microbes in the body.

(2) **Acid Rain**—Acid rain is the result of a variety of process which together lead to acidic gases being deposited from the atmosphere. The gases involved are SO_2 and various oxides of N_2.

(iii) **Antibiotic**—Antibiotic are used to fight against disease and are used in the prevention and treatment of diseases.

Example : Penicillin, Streptomycin etc.

Question 5.

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

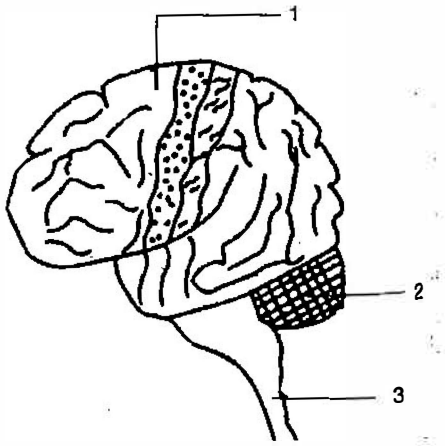
(i) *Name the parts labelled 1,2 and 3.*

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

(iii) *How are the brain cells arranged in the part labelled '1' ?*

(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.*

(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]**

Answer :

(a) (i) (1) Cerebrum, (2) Cerebellum, (3) Medulla oblongata.

(ii) **Part 1 (Cerebrum) :** Associated with memory, intelligence and sensation.

Part 2 (Cerebellum) : Associated with voluntary muscular movements and maintenance of equilibrium.

(iii) In cerebrum, brain cells are densely packed in the outer region.

(iv) Neuron.

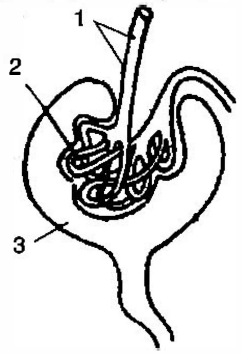
(v) Cerebrospinal fluid.

Functions : (1) It protects CNS against mechanical shock and injury.
(2) It maintains a constant pressure inside the cranium.

(b) (i) Endarch (ii) Yellow spot (iii) Tubectomy (v) Phagocytosis

Question 6.

(a) *Given alongside 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]**

Answer :

(a) (i) 1. Afferent arteriole, 2. Glomerulus, 3. Bowman's capsule.

(ii) The collective term used for part 2 and 3 is Malpighian capsule.

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

(iii) Right kidney is at a slightly lower level than the left because liver pushes it down.

(iv) Homeostasis : The method of keeping the composition of the body fluids the same, is called homeostasis.

The kidney, by the process of osmoregulation, maintain the osmotic concentration of the body and removal of extra water or salts.

(b) (i) Uterus : Implantation—Fallopian tube : **Fertilization**

(ii) Eye : Optic nerve—Ear : **Auditory nerve.**

(iv) RNA : Ribosome—Cristae : **Mitochondria.**

(v) Ureter : Carring Urine—Eustachian tube : **Equalises air pressure.**

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.* **

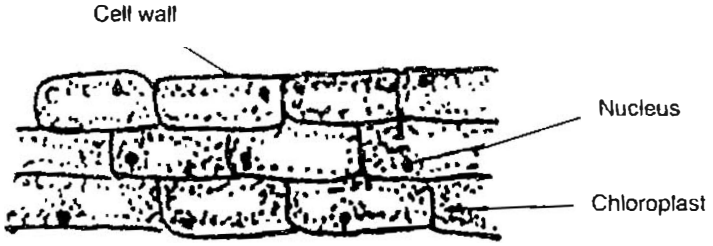
(iii) *On entering a poorly lit room, one feels blinded for a short while.*

(iv) *Glucose is normally not found in urine.*

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

Answer :

(a) (i)



Onion Peel

(ii) In check cells the intercelluler spaces is not present.

(iii) Iodine is used for staining.

(b) (iii) In bright light cones functions. In a poorly lit room the rods function by secretion of rhodopsin. It takes sometime to secrete rhodopsin.

(iv) Because the too big molecules of glucose usually gets reabsorbed into blood stream and turned into glycogen by insulin.

(v) Xerophytes are growing in scarcity of water. In order to decrease the rate of transpiration their leaves are modified into spines or reduced in size.

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