ICSE 2024 EXAMINATION

BIOLOGY

SAMPLE PAPER - 4

Maximum Marks: 80
Time allowed: Two hours
Answers to this Paper must be written on the paper provided separately.
You will not be allowed to write during 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.

Section A** is compulsory. Attempt **any four** questions from **Section B.
The intended marks for questions or parts of questions are given in brackets [ ].

SECTION - A

(*Attempt **all** questions* from this section.)

Question 1.

Select the correct answers to the questions from the given options. (Do not copy the question. Write the correct answer only) : [15]

(i) The secretion of seminal vesicles contains.
(a) mucus only (b) testosterone (c) fructose (d) spermotozoa

(ii) Maximum number of individuals an environment can support is called :
(a) biotic potential (b) carrying capacity (c) birth rate (d) mortality

(iii) The organ that acts like a natural dialysis chamber in the human body is:
(a) Heart (b) Brain (c) Kidneys (d) Pancreas

(iv) Blood circulation takes the following course in the human heart :
(a) left atrium → left ventricle → lungs → right atrium → right ventricle
(b) right atrium → aorta → lungs → left ventricle → left atrium
(c) left atrium → left ventricle → pulmonary artery → lungs → right ventricle
(d) right atrium → right ventricle → lungs → left atrium → left ventricle

(v) Which of the following statements about endocrine glands is correct?
(a) Endocrine glands release hormones directly into the bloodstream.
(b) Endocrine glands release hormones into ducts that carry them to target organs.
(c) Endocrine glands primarily function in the digestion and absorption of nutrients.
(d) Endocrine glands are responsible for producing and releasing enzymes for digestion.

(vi) Light reaction takes place in the :
(a) grana of chloroplast (b) stroma of chloroplast (c) mitochondria (d) cytoplasm

(vii) Consider the following statements:

I. Radiation pollution is caused by excessive noise levels in the environment.

II. Radiation pollution occurs when radioactive materials are released into the environment, causing potential harm.

Choose the correct option.
(a) Statement I is correct and statement II is incorrect.
(b) Statement II is correct and statement I is incorrect.
(c) Both statements I and II are correct.
(d) Both statements I and II are incorrect.

(viii) Tricuspid valve is present between :

(a) Right atrium and ventricle (b) the two atria
(c) the two ventricles (d) left atrium and ventricle

(ix) The first vaccine was developed to provide protection from :
(a) Polio (b) Smallpox (c) Chickenpox (d) Tuberculosis

(x) Contraction of uterus during childbirth is caused by :
(a) TSH (b) oxytocin (c) FSH (d) glucagon

(xi) Which of the following statements accurately compares tubectomy and vasectomy?
(a) Tubectomy and vasectomy are both surgical procedures performed on males to achieve permanent contraception.
(b) Tubectomy and vasectomy are both surgical procedures performed on females to achieve permanent contraception.
(c) Tubectomy is a surgical procedure that involves the cutting or blocking of the fallopian tubes in females, while vasectomy is a surgical procedure that involves the cutting or blocking of the vas deferens in males.
(d) Tubectomy is a surgical procedure that involves the cutting or blocking of the vas deferens in males, while vasectomy is a surgical procedure that involves the cutting or blocking of the fallopian tubes in females.

(xii) A pair of genes that controls two alternative expressions of the same character in the homologous chromosomes is.
(a) Genotypes (b) Alleles (c) Genes (d) Phenotypes

(xiii) Which of the following statements accurately compares haemophilia and colourblindness in terms of their symptoms?
(a) Both haemophilia and colourblindness primarily affect the visual perception of individuals.
(b) Haemophilia is characterised by prolonged bleeding and difficulty in blood clotting, while colourblindness is characterised by the inability to perceive certain colours.
(c) Haemophilia is characterised by the inability to perceive certain colours, while colourblindness is characterised by prolonged bleeding and difficulty in blood clotting.
(d) Both haemophilia and colourblindness have no noticeable symptoms and are typically diagnosed through genetic testing.

(xiv) Which of the following is formed during light dependent phase of photosynthesis?
(a) Sugar (b) NADPH
(c) Oxygen and carbon dioxide (d) CO_2

(xv) A colourless ground substance present inside the chloroplast is.
(a) Stroma (b) Grana (c) Stoma (d) Lamellae

Question 2.

(i) Name the following: **[5]**
(a) Raw materials of photosynthesis
(b) Conditioned reflexes are controlled by this part of brain
(c) The largest detoxifying gland present in our body
(d) The middle coat of the eye
(e) The nitrogenous waste that passes from foetus to mother through placenta

(ii) Arrange and rewrite the terms in each group in the correct order so as to be in a logical sequence beginning with the term that is underlined. **[5]**
(a) Midbrain, diencephalon, <u>cerebrum</u>, medulla oblongata, cerebellum.
(b) Choroid, <u>sclera</u>, vitreous body, retina
(c) Bowman's capsule, <u>Renal arteriole</u>, Loop of Henle, Collecting tubule
(d) Embryo, foetus, blastocyst, <u>zygote</u>
(e) Oviduct, <u>fimbriae</u>, uterus, cervix

(iii) Match the items in Column 'A' with those which are most appropriate in Column 'B'. Rewrite the matching pairs as shown in the example : [5]

Column A	Column B
(i) Bolting	(a) Control of automobile exhaust
(ii) Leydig cells	(b) Water
(iii) Utriculus	(c) Gibberellin
(iv) Hydrotropism	(d) Dynamic equilibrium
(v) Euro IV norms	(e) Testosterone
	(f) Sudden change in genes
	(g) Static equilibrium

(iv) Choose the odd one out from the following terms and name the category to which the others belong: [5]

(a) Oxygen, carbon dioxide, water, nitrogen
(b) Imbibition, diffusion, active transport, osmosis
(c) Chlorophyll, water, transpiration, sunlight
(d) Ureter, urethra, uterus, testis
(e) Dura matter, pia matter, arachnoid, grey matter

(v) Give the exact location of : [5]

(a) Dark reaction
(b) Prostate gland
(c) Corpus luteum
(d) Centrosome
(e) Prostate gland

SECTION - B

(Attempt any four questions from this Section.)

Question 3.

(i) Define Hydathodes. [1]

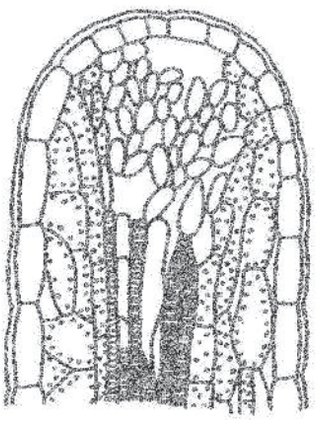
(ii) Differentiate between erythrocytes and leucocytes (function). [2]

(iii) What is parthenogenesis? Give example. [2]

(iv) What is goitre? Mention the measures to prevent it. [2]

(v) The figure alongside represents the vertical section of a leaf. [3]

(a) Name the given structure.
(b) Give an example of two plants where this structure is present.
(c) Which physiological process takes place through this structure?



Question 4. [1]

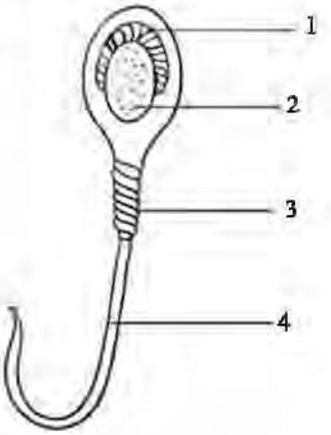
(i) Expand – FSH and LH. [2]

(ii) Differentiate between Natality and Mortality. [2]

(iii) The amnion sac in the uterus of the female during pregnancy is filled with a fluid. [2]

(iv) Sickness leads to poverty and poverty to sickness. Explain. [3]

(v) Refer to the picture and answer the questions that follow:



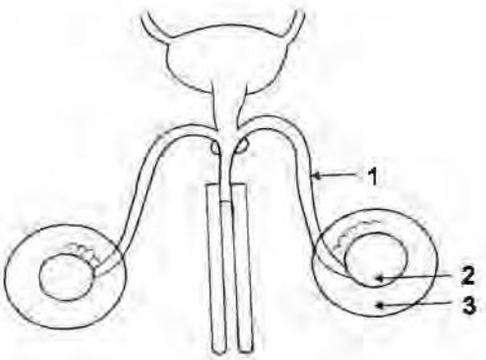
(a) Mention the function of part labelled as 1.
(b) Identify the structure labelled as 2 and write its significance.
(c) What would happen if the structure marked as 4 was absent?

Question 5.

(i) Define – Greenhouse effect. [1]
(ii) What is the significance of eustachian tube in ear? [2]
(iii) A mature mammalian erythrocyte lacks nucleus and mitochondria. Explain. [2]
(iv) Why is insulin not given orally but is injected into the body? [2]
(v) Draw a neat diagram of a single Malpighian corpuscle and label the following parts: [3]
Glomerulus, Bowman's capsule, Afferent arteriole, and Efferent arteriole.

Question 6.

(i) Define Cerebrospinal fluid. [1]
(ii) Differentiate between vasopressin and oxytocin. [2]
(iii) State the function of pinna. [2]
(iv) Twins may or may not be identical. Explain. [2]
(v) The diagram given below shows the male urinogenital system of a human being. Study the diagram and answer the questions that follow : [3]



(a) Label the parts numbered 1 and 2.
(b) Name the corresponding structure of part (1) in female reproductive system.
(c) What is the role of part 3?

Question 7.

(i) Define Placenta. **[1]**

(ii) Draw a Punnett square to show the gametes and offspring when both the plants have heterozygous round seeds (Rr). **[2]**

(iii) State the Monohybrid cross given by Mendel. **[2]**

(iv) How does a cell wall and a cell membrane differ in their permeability? **[2]**

(v) Draw a labelled diagram showing major endocrine glands in human body. Name the gland which is exo-endocrine gland. **[3]**

Question 8.

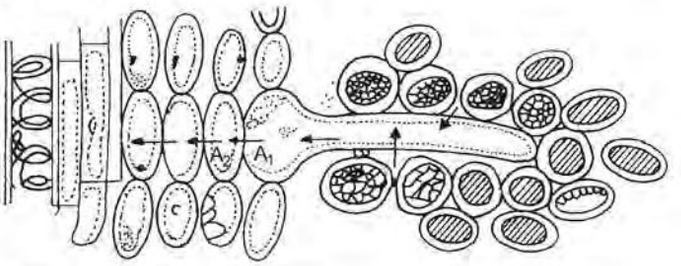
(i) Define Plasmolysis. **[1]**

(ii) Briefly explain the term 'Biomedical Waste' why it is considered harmful? **[2]**

(iii) Differentiate between – midbrain and hindbrain. **[2]**

(iv) Name two nutritional deficiency diseases. Give some food sources to overcome these diseases. **[2]**

(v) The figure given below is a diagrammatic representation of a part of root hair zone. Study the diagram and answer the questions that follow : **[3]**



(a) Is the root hair unicellular or multicellular?

(b) Name the process responsible for the entry of water molecules from the soil into root hair.

(c) What pressure is responsible for the movement of water in the direction indicated by arrows?

SOLUTION

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

Section A** is compulsory. Attempt **any four** questions from **Section B.
The intended marks for questions or parts of questions are given in brackets [ ].

SECTION - A

(*Attempt **all** questions* from this section.)

Question 1.

Select the correct answers to the questions from the given options. **[15]**

(Do not copy the question. Write the correct answer only) :

(i) The secretion of seminal vesicles contains.

(a) mucus only (b) testosterone (c) fructose (d) spermotozoa

Ans. (c) fructose

(ii) Maximum number of individuals an environment can support is called :

(a) biotic potential (b) carrying capacity (c) birth rate (d) mortality

Ans. (b) carrying capacity

(iii) The organ that acts like a natural dialysis chamber in the human body is:

(a) Heart (b) Brain (c) Kidneys (d) Pancreas

Ans. (c) Kidneys

(iv) Blood circulation takes the following course in the human heart :

(a) left atrium → left ventricle → lungs → right atrium → right ventricle
(b) right atrium → aorta → lungs → left ventricle → left atrium
(c) left atrium → left ventricle → pulmonary artery → lungs → right ventricle
(d) right atrium → right ventricle → lungs → left atrium → left ventricle

Ans. (d) right atrium → right ventricle → lungs → left atrium → left ventricle

(v) Endocrine glands play a vital role in human body by producing and secreting hormones that regulate various physiological process including growth, metabolism and reproduction. Which of the following statements about endocrine glands is correct?

(a) Endocrine glands release hormones directly into the bloodstream.
(b) Endocrine glands release hormones into ducts that carry them to target organs.
(c) Endocrine glands primarily function in the digestion and absorption of nutrients.
(d) Endocrine glands are responsible for producing and releasing enzymes for digestion.

Ans. (a) Endocrine glands release hormones directly into the bloodstream.

(vi) Light reaction takes place in the :

(a) grana of chloroplast (b) stroma of chloroplast (c) mitochondria (d) cytoplasm

Ans. (a) grana of chloroplast

(vii) Assertion (A): Radiation pollution is caused by excessive noise levels in the environment.

Reason (R): Radiation pollution occurs when radioactive materials are released into the environment and cause potential harm.

(a) Both (A) and (R) are true (b) Both (A) and (R) are false
(c) (A) is true and (R) is false (d) (A) is false and (R) is true

Ans. (d) (A) is false and (R) is true

(viii) Tricuspid valve is present between :

(a) Right atrium and ventricle (b) the two atria
(c) the two ventricles (d) left atrium and ventricle

Ans. (a) right atrium and ventricle

(ix) The first vaccine was developed to provide protection from :

(a) Polio (b) Smallpox (c) Chickenpox (d) Tuberculosis

Ans. (b) Smallpox

(x) Contraction of uterus during childbirth is caused by :

(a) TSH (b) oxytocin (c) FSH (d) glucagon

Ans. (b) oxytocin

(xi) Which of the following statements accurately compares tubectomy and vasectomy?

(a) Tubectomy and vasectomy are both surgical procedures performed on males to achieve permanent contraception.
(b) Tubectomy and vasectomy are both surgical procedures performed on females to achieve permanent contraception.
(c) Tubectomy is a surgical procedure that involves the cutting or blocking of the fallopian tubes in females, while vasectomy is a surgical procedure that involves the cutting or blocking of the vas deferens in males.
(d) Tubectomy is a surgical procedure that involves the cutting or blocking of the vas deferens in males, while vasectomy is a surgical procedure that involves the cutting or blocking of the fallopian tubes in females.

Ans. (c) Tubectomy is a surgical procedure that involves the cutting or blocking of the fallopian tubes in females, while vasectomy is a surgical procedure that involves the cutting or blocking of the vas deferens in males.

(xii) The human brain is a complex organ responsible for processing and storing information, coordinating bodily functions, and generating thoughts and emotions. It is composed of different structures. Among the listed options, identify the structures of forebrain.

P – Corpus callosum
Q – Cerebral peduncle
R – Hypothalamus
S – Optic lobes

(a) P and R (b) Q and R (c) R and S (d) P, Q and R

Ans. (a) P and R

(xiii) Which of the following statements accurately compares haemophilia and colourblindness in terms of their symptoms?

(a) Both haemophilia and colourblindness primarily affect the visual perception of individuals.
(b) Haemophilia is characterised by prolonged bleeding and difficulty in blood clotting, while colourblindness is characterised by the inability to perceive certain colours.
(c) Haemophilia is characterised by the inability to perceive certain colours, while colourblindnessis characterised by prolonged bleeding and difficulty in blood clotting.
(d) Both haemophilia and colourblindness have no noticeable symptoms and are typically diagnosed through genetic testing.

Ans. (b) Haemophilia is characterised by prolonged bleeding and difficulty in blood clotting, while colourblindness is characterised by the inability to perceive certain colours.

(xiv) Which of the following is formed during light dependent phase of photosynthesis?

(a) Sugar (b) NADPH
(c) Oxygen and carbon dioxide (d) CO_2

Ans. (b) NADPH

(xv) A colourless ground substance present inside the chloroplast is.

(a) Stroma (b) Grana (c) Stoma (d) Lamellae

Ans. (a) Stroma

Question 2.

(i) Name the following: **[5]**

(a) Raw materials of photosynthesis
(b) Conditioned reflexes are controlled by this part of brain
(c) The largest detoxifying gland present in our body
(d) The middle coat of the eye
(e) The nitrogenous waste that passes from foetus to mother through placenta

Ans. (a) Carbon dioxide and water
(b) Cerebral cortex
(c) Liver
(d) Choroid
(e) Urea

(ii) Arrange and rewrite the terms in each group in the correct order so as to be in a logical sequence beginning with the term that is underlined. **[5]**

(a) Midbrain, diencephalon, <u>cerebrum</u>, medulla oblongata, cerebellum.
(b) Choroid, <u>sclera</u>, vitreous body, retina
(c) Bowman's capsule, <u>Renal arteriole</u>, Loop of Henle, Collecting tubule
(d) Embryo, foetus, blastocyst, <u>zygote</u>
(e) Oviduct, <u>fimbriae</u>, uterus, cervix

Ans. (a) Cerebrum, diencephalon, midbrain, cerebellum, medulla oblongata
(b) Sclera, choroid, retina, vitreous body
(c) Renal arteriole, Bowmans capsule, Loop of Henle, Collecting tubule
(d) Zygote, blastocyst, embryo, foetus
(e) Fimbriae, oviduct, uterus, cervix

(iii) Match the items in Column 'A' with those which are most appropriate in Column 'B'. Rewrite the matching pairs as shown in the example : **[5]**

Column A	**Column B**
(i) Bolting	(a) Control of automobile exhaust
(ii) Leydig cells	(b) Water
(iii) Utriculus	(c) Gibberellin
(iv) Hydrotropism	(d) Dynamic equilibrium
(v) Euro IV norms	(e) Testosterone
	(f) Sudden change in genes
	(g) Static equilibrium

Ans. (i) Bolting — (c) Gibberellin
(ii) Leydig cells — (e) Testosterone
(iii) Utriculus — (g) Static equilibrium
(iv) Hydrotropism — (b) Water
(v) Euro IV norms — (a) Control of automobile exhaust

(iv) Choose the odd one out from the following terms and name the category to which the others belong: **[5]**

(a) Oxygen, carbon dioxide, water, nitrogen

(b) Imbibition, diffusion, active transport, osmosis

(c) Chlorophyll, water, transpiration, sunlight

(d) Ureter, urethra, uterus, testis

(e) Dura matter, pia matter, arachnoid, grey matter

Ans. (a) Odd term : Water
Category : All others are gases found in atmosphere

(b) Odd term : Active transport
Category : Process that do not require energy

(c) Odd term : Transpiration
Category : Raw materials of photosynthesis

(d) Odd term : Uterus
Category : The organs of male reproductive system

(e) Odd term : Grey matter
Category : Meninges, or brain covering

(v) Give the exact location of : **[5]**

(a) Dark reaction

(b) Prostate gland

(c) Corpus luteum

(d) Centrosome

(e) Prostate gland

Ans. (a) Dark reaction – It occurs in the stroma of the chloroplast.

(b) Prostate gland – a bilobed structure surrounding the urethra close to its origin from the bladder.

(c) Corpus luteum – It is a yellow-coloured hormone secreting structure in the ovary.

(d) Centrosome – Situated next to the nucleus in an animal cell.

(e) Prostate gland – It is a bilobed structure that surround urethra close to its origin from bladder.

SECTION - B

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

Question 3.

(i) Define Hydathodes. **[1]**

(ii) Differentiate between erythrocytes and leucocytes (function). **[2]**

(iii) What is parthenogenesis? Give example. **[2]**

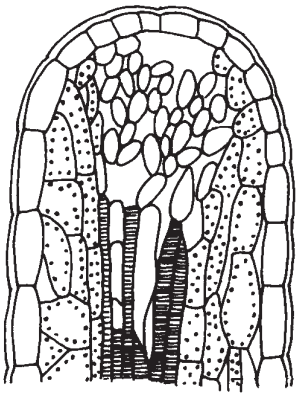
(iv) What is goitre? Mention the measures to prevent it. **[2]**

(v) The figure alongside represents the vertical section of a leaf. **[3]**

(a) Name the given structure.

(b) Give an example of two plants where this structure is present.

(c) Which physiological process takes place through this structure?



Ans.

(i) Hydathodes: These are small openings on leaf margins of some vascular plants, responsible for guttation (release of water droplets) under conditions in which transpiration is inhibited or when the atmosphere is very humid.

(ii) Erythrocytes transport the oxygen to different organs of the body. Leucocytes produce antibodies which destroy, foreign bodies and bacteria.

(iii) The development of an organism from an unfertilised egg is known as parthenogenesis. This occurs in many lower plants (e.g. roses and orange trees) and in a few animals (wasps, aphids).

(iv) **Underactivity of the thyroid** results in swelling of thyroid, called goitre in the throat. It is more common in the hills like Shiwaliks, Himalayas and North-Eastern region of India. Consumption of iodised salt is one of the best remedy for iodine deficiency. That is why, the government has made it mandatory for all salt manufacturers to supply iodised salt only.

(v) (a) Hydathode

(b) Garden nasturtium, grasses

(c) Guttation

Question 4. **[1]**

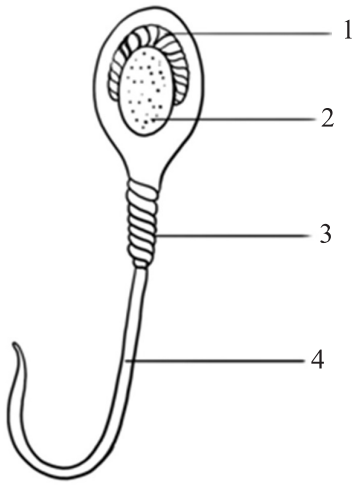
(i) Expand – FSH and LH. **[2]**

(ii) Differentiate between Natality and Mortality. **[2]**

(iii) The amnion sac in the uterus of the female during pregnancy is filled with a fluid. **[2]**

(iv) Sickness leads to poverty and poverty to sickness. Explain. **[3]**

(v) Refer to the picture and answer the questions that follow:



(a) Mention the function of part labelled as 1.

(b) Identify the structure labelled as 2 and write its significance.

(c) What would happen if the structure marked as 4 was absent?

Ans.

(i) FSH = Follicle Stimulating Hormone

LH = Luteinizing hormone

(ii) **Natality** — It is the number of births per 1000 individuals in the population per year or average number of children per unit time.

Mortality — Number of death per 1000 individuals in the population per year.

(iii) The amnion is a sac filled with amnion fluid. It develops around the embryo during gestation period. The fluid acts as a cushion for the embryo and protects it from jerks, and also prevents sticking the foetus to the amnion.

(iv) It is true that once the person starts falling sick regularly, all his savings go into the treatments leading to poverty and other related problems. A sick person may also not be able to do work efficiently to earn enough livelihood. If all this prevail for a long time it leads to more physical ailments. Therefore, both sickness and poverty go hand in hand.

(v) (a) 1 represents acrosome that contains enzymes which facilitates the entry of sperm into the egg by dissolving the ovum's wall.

(b) 2 represents nucleus. It contains genetic material which, during fertilisation combines with the nucleus of egg and result in the formation of zygote.

(c) 4 represent tail and in its absence, the sperm will not be able to swim in the female reproductive tract.

Question 5.

(i) Define – Greenhouse effect. **[1]**

(ii) What is the significance of eustachian tube in ear? **[2]**

(iii) A mature mammalian erythrocyte lacks nucleus and mitochondria. Explain. **[2]**

(iv) Why is insulin not given orally but is injected into the body? **[2]**

(v) Draw a neat diagram of a single Malpighian corpuscle and label the following parts: **[3]**

Glomerulus, Bowman's capsule, Afferent arteriole, and Efferent arteriole.

Ans.

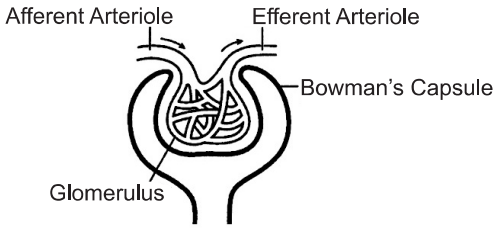
(i) Greenhouse effect : The greenhouse effect is a natural process in which certain gases called greenhouse gases trap heat that radiate from the earth's surface. The greenhouse gases function much like the glass panels that trap heat inside the greenhouse.

(ii) Eustachian tube connects the middle ear to the back of the throat in vertebrates. It is normally closed but during swallowing it opens to allow air into the middle ear, which equalises the air-pressure on each side of eardrum.

(iii) Lack of nucleus helps the RBCs to absorb more oxygen. Absence of mitochondria helps the RBCs to transport maximum oxygen to the tissues or body cells without being utilised in the cell itself.

(iv) Hormones are secreted and poured directly into the blood. Since insulin is a peptide hormone, it will get digested if given orally. So, insulin, is injected into the body.

(v) Malpighian Corpuscle



Question 6.

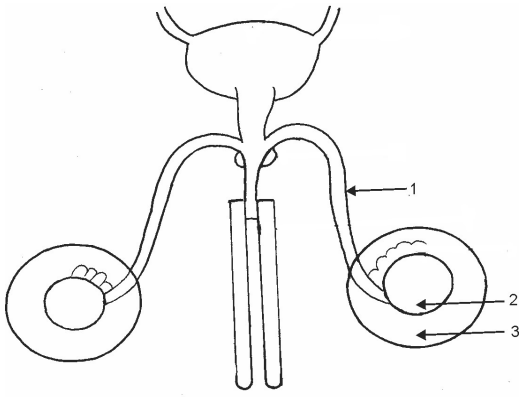
(i) Define Cerebrospinal fluid. **[1]**

(ii) Differentiate between vasopressin and oxytocin. **[2]**

(iii) State the function of pinna. **[2]**

(iv) Twins may or may not be identical. Explain. **[2]**

(v) The diagram given below shows the male urinogenital system of a human being. Study the diagram and answer the questions that follow : **[3]**



(a) Label the parts numbered 1 and 2.

(b) Name the corresponding structure of part (1) in female reproductive system.

(c) What is the role of part 3?

Ans.

(i) Cerebrospinal fluid : This is the fluid present around the brain and the spinal cord to absorb shock and prevent friction and infection to the organs.

(ii) Vasopressin : It is water-retaining hormone responsible for maintaining electrolyte balance.

Oxytocin : It causes contraction of uterus during childbirth and secretion of milk during lactation period.

(iii) Pinna : The external ear or the 'Pinna' of human beings capture the sound waves from the air and pass them into the middle ear.

(iv) If the twins are produced from the same zygote, the twins will be identical. But, if two zygotes are produced which give rise to two individuals, they may not be identical.

(v) (a) 1 — Vas deferens (sperm duct)

2 — Testis (testicle)

(b) Oviduct or Fallopian tube

(c) Scrotum is a sac of skin that supports the testes. It is found outside the body cavity and allows sperm to develop maintaining the low temperature.

Question 7.

(i) Define Placenta. **[1]**

(ii) Draw a Punnett square to show the gametes and offspring when both the plants have heterozygous round seeds (Rr). **[2]**

(iii) State the Monohybrid cross given by Mendel. **[2]**

(iv) How does a cell wall and a cell membrane differ in their permeability? **[2]**

(v) Draw a labelled diagram showing major endocrine glands in human body. Name the gland which is exo-endocrine gland. **[3]**

Ans.

(i) Placenta is an endocrine structure that produce hormones oestrogen and progesterone during pregnancy.

(ii) Parents Rr 5 Rr

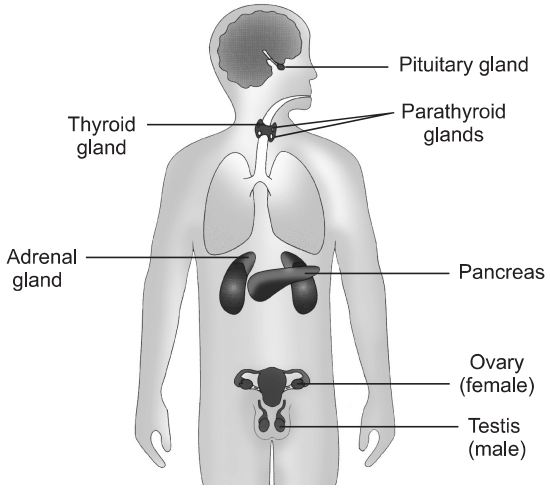
♀ ↓ / ♂ →	R	r
R	RR	Rr
r	Rr	rr

Gametes = R, r
Offspring = RR, Rr, Rr, rr

(iii) Monohybrid cross : It is a cross between two pure breeding different varieties of organisms consisting of the alternative alleles of one single character. Crossing between these offspring yields a characteristic 3 : 1 ratio in the following generation of dominant to recessive phenotypes.

(iv) Cell wall is usually freely permeable which allow the passage of water molecules and glucose molecules. The cell membrane is selectively permeable because, only selective materials and water can pass through it.

(v) Endocrine glands in human body



Pancreas is both exocrine and endocrine in function

Question 8.

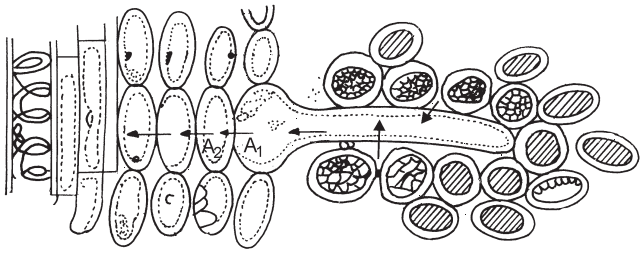
(i) Define Plasmolysis. **[1]**

(ii) Briefly explain the term 'Biomedical Waste' why it is considered harmful? **[2]**

(iii) Differentiate between – midbrain and hindbrain. **[2]**

(iv) Name two nutritional deficiency diseases. Give some food sources to overcome these diseases. **[2]**

(v) The figure given below is a diagrammatic representation of a part of root hair zone. Study the diagram and answer the questions that follow : **[3]**



(a) Is the root hair unicellular or multicellular?

(b) Name the process responsible for the entry of water molecules from the soil into root hair.

(c) What pressure is responsible for the movement of water in the direction indicated by arrows?

Ans.

(i) **Plasmolysis —** The shrinkage of protoplasm of a cell when it is kept in hypertonic solution is known as plasmolysis.

(ii) Biomedical waste refers to the waste consisting of discarded medicinal needles, syringes, used dressings, medicines, etc. These waste materials reaches the soil and cause harm to soil organisms, plant growth, and to humans indirectly through some agents.

(iii) **Midbrain** connects the forebrain to hindbrain and controls muscle tonning, modifies some motor activities and has reflexes for sight and hearing.

Hindbrain consists of cerebellum and medulla. Cerebellum is concerned with co-ordination of muscles and maintaining posture and equilibrium. Medulla oblongata controls the activities of the internal organs. It also has reflex centres.

(iv) 1. **Scurvy –** Vitamin C rich food such as orange, lemon, grapes etc.

2. **Beri-beri –** Vitamin B rich food such as nuts, whole grains, fish, egg, meat, etc.

(v) (a) Unicellular (b) Endosmosis (c) Osmotic pressure