

SECTION A – 40 MARKS

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

Question 1

[15]

Select the correct answers to the questions from the given options.

(Do not copy the questions, write the correct answer only).

- (i) Duplicated chromosomes are joined at a point termed:
 - (a) Centrosome
 - (b) Centromere
 - (c) Centriole
 - (d) Chromatid

- (ii) The process of conversion of ADP to ATP during photosynthesis is called:
 - (a) Photolysis
 - (b) Phagocytosis
 - (c) Photophosphorylation
 - (d) Polymerisation

- (iii) The process in which water is lost from the margins of strawberry leaves is:
 - (a) Osmosis
 - (b) Imbibition
 - (c) Diffusion
 - (d) Guttation

- (iv) The hormone that affects urination is:
 - (a) Adrenaline
 - (b) Vasopressin
 - (c) Oestrogen
 - (d) Thyroxine

- (v) Which one of the following helps in the opening of stomata:
 - (a) Cobalt ions
 - (b) Potassium ions
 - (c) Magnesium ions
 - (d) Aluminium ions

- (vi) A zygote which has Y chromosome inherited from the father will develop into a:
 - (a) Will depend on the chromosome inherited from the mother
 - (b) Girl
 - (c) Either boy or a girl
 - (d) Boy

- (vii) The ear ossicle that transports sound vibrations to the inner ear:
- (a) Stapes
 - (b) Malleus
 - (c) Incus
 - (d) Cochlea
- (viii) If a person has a heart attack, what must be done immediately?
- P.** Loosen his/her clothing
 - Q.** Make him/her lie down in an airy room
 - R.** Rush him/her to the hospital
 - S.** Engage him/her in a conversation
- (a) **P and Q**
 - (b) **P and S**
 - (c) **R and S**
 - (d) **P, Q and R**
- (ix) Adjusting the focal length of the eye lens to view objects at different distances is done by:
- (a) Cornea
 - (b) Iris
 - (c) Ciliary muscles
 - (d) Sclera
- (x) Four friends **P, Q, R** and **S** were discussing the examples of genetic disorders. The examples they quoted were as follows:
- P.** Colour blindness and Malaria
 - Q.** Albinism and Cholera
 - R.** Haemophilia and Colour blindness
 - S.** Haemophilia and Albinism
- Who gave the correct examples?
- (a) **P and Q**
 - (b) **R and S**
 - (c) **P and R**
 - (d) **Q and S**
- (xi) Osmosis takes place when there is:
- (a) A freely permeable membrane
 - (b) A cell wall
 - (c) A selectively permeable membrane
 - (d) An impermeable membrane

(xii) A male gorilla has 48 chromosomes in each of its body cells. How many chromosomes will each of the sperms have?

- (a) 24
- (b) 48
- (c) 12
- (d) 16



(xiii) **Assertion (A):** Sympathetic nervous system prepares the body for violent action against abnormal conditions.

Reason (R): Sympathetic nervous system accelerates heartbeat.

Which of the following is correct?

- (a) Both A and R are True
- (b) A is True, R is False
- (c) A is False but R is True
- (d) Both A and R are False

(xiv) Birth rate is the number of live births per thousand persons in:

- (a) 1 year
- (b) 2 years
- (c) 10 years
- (d) 20 years

(xv) Industrial Melanism was observed in:

- (a) Mice
- (b) Peppered Moth
- (c) House Flies
- (d) Crow

Comments of Examiners

- (i) Most candidates provided the correct answer. A common error, however, was that they referred to the 'centrosome' as the 'centromere'.
- (ii) Majority of the candidates wrote the correct answer. However, a few candidates mentioned 'photolysis' and 'polymerisation' instead of 'photophosphorylation'.
- (iii) A large number of candidates mentioned the correct answer. However, a few candidates wrote 'osmosis' in place of 'guttation'.
- (iv) Majority of the candidates answered this question correctly. However, a few of the candidates were confused with the functions of 'adrenaline' and 'vasopressin'.
- (v) Several candidates mentioned the correct answer. A few other candidates wrote 'magnesium' in place of 'potassium'.
- (vi) Majority of the candidates wrote the correct answer. However, some candidates failed to mention the correct answer and wrote either 'boy or a girl'.
- (vii) Almost all the candidates answered correctly. A few candidates chose 'malleus' in place of 'stapes'.
- (viii) Some of the candidates answered correctly but many candidates selected the option 'P and Q' instead of 'P, Q and R' as they did not read the options carefully.
- (ix) This part was answered correctly by most of the candidates and a few candidates wrote 'iris' in place of 'ciliary muscles.'
- (x) All the candidates answered this part correctly.
- (xi) Several candidates mentioned the correct answer.
- (xii) Almost all the candidates had confusion regarding 'the number of chromosomes in body cells and gametes.'
- (xiii) Few candidates answered correctly, however, other candidates selected the options (b) and (c) instead of (a).
- (xiv) This part was answered correctly by most of the candidates. However, a few of the candidates answered incorrectly as '10 years' instead of 'one year'.
- (xv) Majority of the candidates answered correctly but a few candidates mentioned 'House flies' and 'Mice' instead of 'Peppered Moth'.

Suggestions for teachers

- Bring out clear differences between the terms centrosome, centromere and centriole.
- Explain clearly regarding the various steps involved in photosynthesis in detail.
- Provide a clear understanding regarding the term guttation and show them the droplets on the margin of leaves by using slides.
- Lay more emphasis on the role of vasopressin in maintaining the water balance in the body.
- Explain clearly that the opening and closing of stomata depend on the potassium ion gradient to avoid any confusion.
- Give a clear understanding of the sex chromosomes in males and females and the way sex is determined at the time of fertilization.
- Teach ear ossicles as per their order, along with charts and diagrams to build better understanding.
- Advise students to read all the options of the question thoroughly before choosing the correct one. Make students aware of the need for simple first aid in case of a heart attack.
- Teach students the location and function of the different parts of the eye with the help of diagrams and charts.
- Provide examples of genetic and non-genetic disorders to students.
- Give a clear differentiation between semi-permeable / selectively permeable, freely permeable and impermeable membranes with suitable examples.
- Clearly elucidate diploid and haploid numbers of chromosomes, chromosomal numbers in body cells and gametes in the class with the help of flow charts.
- Bring out the contrast between mitosis and meiosis with regard to the number of chromosomes in gametes and somatic cells.
- Emphasize the role of the sympathetic and parasympathetic nervous systems.

Suggestions for teachers

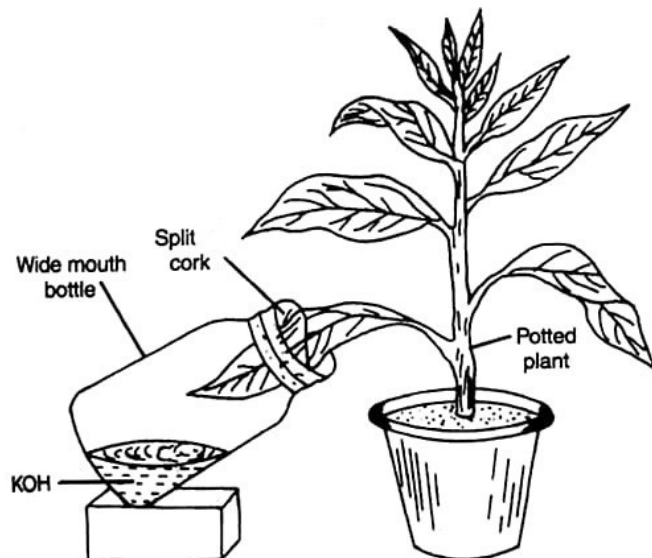
- Ensure sufficient practice of Assertion and Reason questions.
- Train the students to learn definitions with the key words.
- Lay focus on providing the correct example for industrial melanism rather than casual learning.

MARKING SCHEME**Question 1**

(i)	(b) Centromere
(ii)	(c) Photophosphorylation
(iii)	(d) Guttation
(iv)	(b) Vasopressin
(v)	(b) Potassium ions
(vi)	(d) Boy
(vii)	(a) Stapes
(viii)	(d) P, Q and R
(ix)	(c) Ciliary muscles
(x)	(b) R and S
(xi)	(c) A selectively permeable membrane.
(xii)	(a) 24
(xiii)	(a) Both A and R are True
(xiv)	(a) 1 year
(xv)	(b) Peppered Moth

Question 2

- (i) **Name the following:** [5]
- Unicellular outgrowths from the epidermis of roots.
 - A defect in our eyes, in which some parts of the object are in focus while the other parts are blurred.
 - The tropic movement of plant parts in response to chemicals.
 - The main nitrogenous waste formed in the body.
 - The process of attachment of fertilized ovum to the wall of uterus.
- (ii) **Arrange and rewrite the terms in each group in the correct order to be in a logical sequence beginning with the term that is underlined:** [5]
- Australopithecus, Cro-Magnon, Homo erectus, Neanderthal man.
 - Pupil, Aqueous humour, Retina, Vitreous humour.
 - Effector, Receptor, Motor neuron, Sensory neuron.
 - Loop of Henle, Distal convoluted tubule, Bowman's Capsule, Proximal convoluted tubule.
 - Water vapour, Soil water, Leaves, Ascent of Sap
- (iii) **Study the diagram given below and fill in the blanks with suitable words:** [5]



In order to prove that carbon dioxide is necessary for (a) _____, a potted plant is placed in dark for 48 hours to (b) _____ the leaves. A part of a leaf is inserted into a conical flask containing potassium hydroxide solution. This is to absorb (c) _____ from the flask. The plant is then placed in sunlight for a few hours. The experimental leaf is tested for starch. The part of the leaf that was inside the conical flask turns (d) _____, whereas the part of the leaf outside turns (e) _____ in colour.

- (iv) **Choose the odd one out from the following terms and name the category to which the others belong:** [5]
- Prothrombin, Thrombin, Fibrinogen, Albumin
 - Tonsils, Glomerulus, Spleen, Lymph nodes

- (c) Neutrophils, Basophils, Monocytes, Eosinophils
(d) Leaves, Styrofoam, Grass, Cow Dung
(e) Pulmonary artery, Renal artery, Coronary artery, Hepatic artery
- (v) Match the items given in **Column I** with most appropriate ones in **Column II** and **[5]**
rewrite the correct matching pairs:

Column I	Column II
(a) Leydig Cells	1. Lack of thyroxine in children
(b) Stoma	2. 12 pairs
(c) Ova	3. Testosterone
(d) Cranial nerve	4. Diffusion of respiratory gases
(e) Cretinism	5. Haploid cells
	6. 31 Pairs
	7. Diploid cells

Comments of Examiners

- (i) (a) This part was answered correctly by most of the candidates. However, a few candidates wrote 'rootlets' which was an incorrect answer.
- (b) Most candidates failed to score as they wrote incorrect answers like 'hyperopia' and 'myopia', while a few candidates did not answer this question.
- (c) Majority of the candidates answered correctly. A few of the candidates wrote incorrect answers like 'chemical tropism'.
- (d) A large number of candidates answered correctly but some of the candidates wrote 'urine' instead of 'urea'.
- (e) Only few candidates were able to write the correct answer without spelling mistakes. However, many candidates mentioned 'ovulation', 'fertilisation', 'gestation' instead of 'implantation'.
- (ii) A large number of candidates answered it correctly. However, a few candidates wrote the term 'leaves after water vapour' instead of writing 'before it' for part (e). Some candidates mentioned 'vitreous humour' after retina' instead of 'before it'. In addition, a few other candidates changed the sequence of 'Homo erectus with Cro magnon'.
- (iii) Several candidates answered it correctly. However, a few candidates were confused with part (d) and (e). They wrote incorrect answers like Blue black for part (d) and brown for part (e) instead of brown for part (d) and blue black for part (e).
- (iv) (a) Most candidates failed to write the category correctly, and mentioned incorrect answers like 'others are present in blood platelets' instead of 'clotting of blood'.
- (b) A large number of candidates failed to score as instead of Lymphatic organs, the candidates mentioned 'circulatory system, Lymph'.
- (c) Majority of the candidates answered correctly. However, a few of the candidates wrote incorrect answers like 'parts of WBCs'.
- (d) Most candidates answered this part correctly. However, a few candidates incorrectly chose the term 'cow dung'.

Suggestions for teachers

- Show with diagrams that the outgrowths from the epidermis are root hairs.
- Train students to differentiate the eye defects correctly with the help of diagrams and charts.
- Use only the correct terms while teaching the tropic movements to avoid confusion.
- Guide students to get a clear understanding of the main nitrogenous waste formed by liver in the body.
- Guide students to differentiate the terms correctly without any confusion.
- Instruct students to follow correct sequence and the logical approach.
- Provide adequate practice to rewrite the terms in correct sequence. Encourage students to read the question carefully and make them understand the expected sequence.
- Facilitate practical work and observation to overcome confusion among students.
- Demonstrate colour change during the starch test and ensure adequate writing practice.
- Advise students to read the question carefully when the observation of an experiment is asked. Ensure practice of similar questions in class.
- Explain the concepts of the mechanism of coagulation of blood.
- Train students to identify the odd term and mention the category of the rest.
- Clarify both the circulatory system and the lymphatic system and explain the concept of lymphatic system and lymphatic organs. Discuss in class the importance of lymphatic organs in maintaining immunity.
- Highlight the granular cytoplasm of neutrophils, Basophils and eosinophils with diagrams while teaching.
- Emphasise on the examples of Biodegradable and Non-biodegradable waste materials.
- Guide students to identify the blood vessels of Pulmonary circulation and Systemic circulation and the type of blood they carry.

- (e) Many candidates lost mark for choosing the term 'Coronary artery' or 'Renal artery' instead of 'Pulmonary artery.'
- (v) A large number of candidates answered this part correctly. However, a few candidates mentioned incorrect answer for part (d) as 31 pairs instead of 12 pairs. Other incorrect answers included diploid cells instead of haploid cells for part (c) and 'haploid cell' instead of 'testosterone' for part (a).

Suggestions for teachers

- Clarify the relation between the words for matching pairs.
- Guide students to identify the difference between the number of cranial and spinal nerves.
- Provide clear differentiations between the terms haploid and diploid.

MARKING SCHEME

Question 2

(i)	(a) Root hairs (b) Astigmatism (c) Chemotropism (d) Urea (e) Implantation
(ii)	(a) Australopithecus, Homo erectus, Neanderthal man, Cro-Magnon (b) Aqueous humour, Pupil, Vitreous humour, Retina (c) Receptor, Sensory neuron, Motor neuron, Effector (d) Bowman's Capsule, Proximal convoluted tubule, Loop of Henle, Distal convoluted tubule (e) Soil water, Ascent of sap, Leaves, Water vapour
(iii)	(a) Photosynthesis (b) Destarch (c) CO ₂ (d) Brown (e) Blue black
(iv)	(a) Odd - Albumin Category – Clotting of blood (b) Odd – Glomerulus Category – Lymphatic organs (c) Odd – Monocytes Category – Granular WBCs (d) Odd – Styrofoam Category – Biodegradable (e) Odd – Pulmonary artery

Category – Carry oxygenated blood.		
(v)	(a) Leydig Cells	3. Testosterone
	(b) Stoma	4. Diffusion of respiratory gases
	(c) Ova	5. Haploid cells
	(d) Cranial nerve	2. 12 pairs
	(e) Cretinism	1. Lack of thyroxine in children

SECTION B – 40 MARKS

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

Question 3

- (i) Expand the abbreviation-NADP. [1]
- (ii) Mention *two* adaptations in roots for absorption of water from the soil. [2]
- (iii) Differentiate between Afferent arteriole and Efferent arteriole (**diameter**). [2]
- (iv) Give *two* examples of water pollutants. [2]
- (v) Ali has some pea plants in his garden which need a support to grow as seen in the picture given below: [3]



- (a) Name the phenomenon depicted by the shoot in the given figure.
- (b) Define the above phenomenon.
- (c) Write the name of the part marked X.

Comments of Examiners

- (i) Most candidates committed spelling errors. However, a few candidates wrote 'Adenosine' instead of 'Adenine,' and 'Diphosphate' instead of 'Dinucleotide Phosphate'.
- (ii) A large number of the candidates wrote the correct answer.
- (iii) Most of the candidates were confused with the diameter and incorrectly mentioned 'narrow for afferent arteriole' and 'wide for efferent arteriole'.
- (iv) Almost all the candidates answered correctly as they had a clear understanding of the water pollutants.
- (v) (a) Majority of the candidates answered it correctly. However, few of the candidates wrote an incorrect answer for part (a) as 'phototropism'.
- (b) A few candidates answered correctly. Majority of the candidates missed the keywords like 'touch stimulus for growth movement'.
- (c) A large number of candidates answered it correctly, but a few candidates provided incorrect answers like 'stem', 'vine', 'creepers'.

Suggestions for teachers

- Highlight the common errors and share a list of biological abbreviations and their expanded forms.
- Emphasise on adaptations in roots for absorption of water from the soil.
- Teach the concept of the diameter of afferent and efferent arteriole with the help of diagrams and charts.
- Emphasise on various stimuli and growth movements in plants with the help of fresh specimens and charts.
- Ensure students learn to differentiate growth movements from turgor movements by quoting suitable examples.
- Advise students to take practical work seriously to enable them to know the difference between tendril, stem and vine.

MARKING SCHEME

Question 3

(i)	Nicotinamide Adenine Dinucleotide Phosphate
(ii)	<ul style="list-style-type: none"> – Large surface area due to the presence of root hairs. – Concentrated cell sap of root hairs. – Root hairs have thin walls. <p style="text-align: right;"><i>(Any two)</i></p>
(iii)	Afferent arteriole – Wide Efferent arteriole – Narrow
(iv)	Plastic, DDT, Sewage, detergents, oil spills, effluents, hot water, mercury, etc. <p style="text-align: right;"><i>(Any two)</i></p>
(v)	<ul style="list-style-type: none"> (a) Thigmotropism (b) Growth movement of plant parts toward touch stimulus (c) Tendril

Question 4

- (i) Give the biological term for the surgical method of contraception in human females. [1]
- (ii) State *two* harmful effects of acid rain on the environment. [2]
- (iii) Mention *two* advantages of Transpiration. [2]
- (iv) Write *any two* objectives of Swachh Bharat Abhiyan. [2]
- (v) Mohan is fond of playing basketball. His concentration is on shooting the ball into the opponent's basket as given in the picture. [3]



- (a) Which part of the brain helps Mohan to concentrate in putting the ball into the basket?
- (b) Name the sense organ that helps to gauge the distance between the ball and the basket.
- (c) Name the part of the brain that co-ordinates all the voluntary muscles of his body.

Comments of Examiners

- (i) Majority of the candidates answered it correctly. However, a few candidates were confused and mentioned 'vasectomy' instead of 'Tubectomy'. Moreover, spelling error like 'Tubecotomy' were also observed.
- (ii) Several candidates answered the question correctly.
- (iii) The question was correctly answered by a large number of candidates. However, some candidates provided an incorrect answer like 'transpiration removes excess water from plants.'
- (iv) Most of the candidates wrote the correct answer. However, few candidates were confused and mentioned 'the measures to be taken to prevent air pollution' instead of objectives.
- (v) (a) Most of the candidates answered correctly.
A few of the candidates were confused with the terms 'cerebellum' and 'cerebrum'.
(b) All the candidates wrote the correct answer.
(c) Majority of the candidates wrote the correct answer.

Suggestions for teachers

- Lay stress on the usage of correct spellings for biological terms. Provide a clear understanding of the two surgical methods for population control.
- Advise students to write relevant answers.
- Emphasise on the objectives of Swachh Bharat Abhiyaan such as discouraging open defecation and maintenance of personal hygiene.
- Lay focus on the location and functions of cerebrum, cerebellum and spinal cord with the help of diagrams, charts and models.

MARKING SCHEME

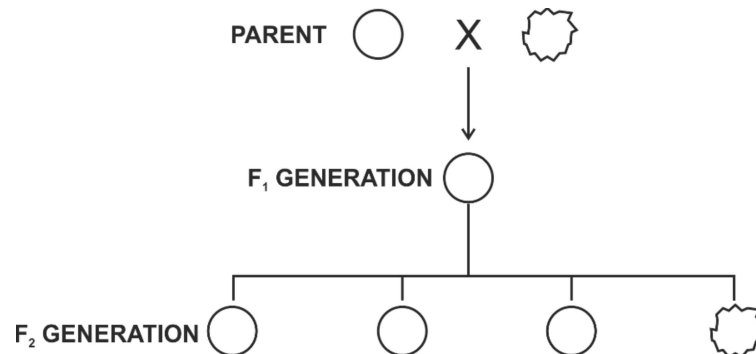
Question 4

(i)	Tubectomy
(ii)	Damage to vegetation, decay of building materials, paints, change in soil pH, erosion of monuments, harm human and animal health, harm to aquatic animals, etc. <i>(Any two)</i>
(iii)	Cooling effect to plant and environment, creates suction force, distribution of water and mineral salts, brings rain. <i>(Any two)</i>
(iv)	Keeping surrounding clean, clean roads and infrastructure, eliminate open defecation by constructing toilets, solid and liquid waste management. <i>(Any two)</i>
(v)	(a) Cerebrum (b) Eye (c) Cerebellum

Question 5

- (i) Name the type of nerve which has the fibres of both sensory and motor neurons. [1]
- (ii) Differentiate between Australopithecus and Modern man based on body hair. [2]
- (iii) "Birth rate in India is very high." Mention *two* reasons in support of the statement. [2]
- (iv) Give the exact location of: [2]

- (a) Pericardium
 (b) Bicuspid valve
- (v) Given below is a schematic representation of the inheritance of the shape of seeds of garden pea. Answer the questions that follow: [3]



- (a) Which is the dominant and recessive allele of the trait?
 (b) What does the ratio 3 : 1 in the F₂ generation represent?
 (c) State Mendel's Law of Dominance.

Comments of Examiners

- (i) Most of the candidates answered this part incorrectly as they wrote 'association neuron' and 'spinal nerve' instead of 'mixed nerve'.
- (ii) Many candidates answered correctly. However, some of the candidates provided vague answers like 'long hair', 'short hair', 'facial hair', etc.
- (iii) Majority of the candidates answered it correctly.
- (iv) (a) Some candidates answered it correctly. Many candidates mentioned incorrect answers like 'on the wall', 'in the wall', 'in the heart', etc.
 (b) Most of the candidates answered correctly. However, few of the candidates mentioned incorrect answers like 'in between right atrium and right ventricle', 'left side of heart', etc.
- (v) (a) A few candidates answered correctly. Many candidates copied the diagram from the question. They did not specify the shape of the seeds in words.
 (b) Majority of the candidates answered correctly. However, a few wrote 'Genotype' instead of 'Phenotype'.
 (c) Most candidates answered it correctly. However, a few candidates failed to

Suggestions for teachers

- Explain the difference between nerve and neuron and the types of nerves clearly with examples.
- Insist on comparative study of various stages in the evolution of human to avoid vague answers.
- Organise a seminar for students to analyse the reasons for population growth in India and the world.
- Explain the location of pericardium with a chart and diagram and insist that students use the correct preposition.
- Show location of valves by using models, charts, diagrams and videos. Write precise location of valves. Discourage candidates from writing 'right side or left side of the heart' for the location of valves.
- Insist on the examples of dominant and recessive traits of the seven Mendelian characters and assess it frequently.
- Instruct students to draw diagrams only when asked in the question.
- Emphasise on the correct meaning of genotype and phenotype.
- Mendel's law of inheritance needs to be explained thoroughly and tested frequently in tests and examinations.

mention a pair of ‘contrasting characters/alleles’ and instead wrote about ‘dominant and recessive traits.’

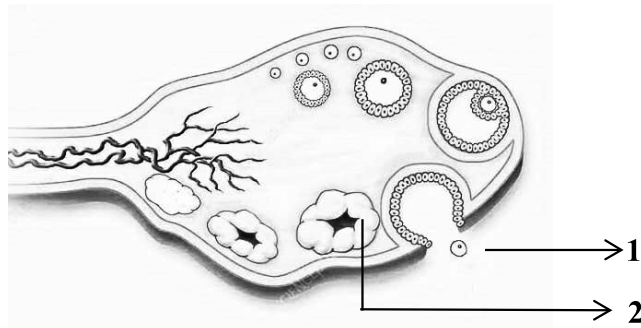
MARKING SCHEME

Question 5

(i)	Mixed nerve
(ii)	Australopithecus – Body covered with hair. Modern man – Reduced body hair.
(iii)	Illiteracy, high mortality rate, children regarded as gift of God, increase family income, do not accept family planning methods, desire for a male child, lack of recreation. <i>(Any two)</i>
(iv)	(a) Surrounding / enveloping / enclosing / covering / around the heart (b) Between the left auricle and left ventricle
(v)	(a) Dominant – Round Recessive - Wrinkled (b) 3 – Round 1 - Wrinkled (c) Out of a pair of contrasting characters / traits / alleles, only one is expressed while the other is suppressed.

Question 6

- (i) Define the term-Diapyknosis. [1]
- (ii) Distinguish between Diabetes mellitus and Diabetes insipidus (**endocrine gland concerned**). [2]
- (iii) Carbon monoxide is dangerous when inhaled in excess. Comment on the statement. [2]
- (iv) The diagram given below shows a section of the human ovary. [2]



- (a) Name the process for the release of the part labelled 1.
- (b) Write the name of the structure marked 2.
- (v) Draw a neat, labelled diagram of a chloroplast. [3]

Comments of Examiners

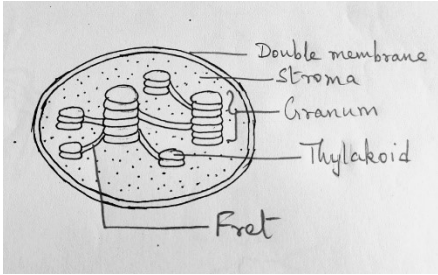
- (i) Most of the candidates answered correctly. However, a few candidates wrote 'blood vessels' instead of 'capillaries.'
- (ii) Majority of the candidates mentioned the correct hormones. However, a few candidates wrote the names of glands and lost marks.
- (iii) A large number of candidates were vague in answering and failed to score. They wrote about the formation of carbamino haemoglobin instead of carboxy haemoglobin.
- (iv) (a) Most of the candidates failed to score as they wrote 'implantation' instead of 'ovulation'.
(b) Majority of the candidates made an error by writing 'graafian follicle' instead of 'corpus luteum'.
- (v) Most of the candidates answered correctly. However, a few candidates made errors in drawing a single membrane and labelling incorrectly.

Suggestions for teachers

- Explain the concept of Diapedesis and the structure of blood vessels with diagrams to avoid confusion. Stress on the fact that diapedesis occurs only through capillaries since they have single layer of epithelium.
- Ensure periodical revision with emphasis on conceptual learning.
- Provide a clear understanding regarding the combination of CO and CO₂ with haemoglobin and the effects on the human body.
- Give a comparative study to remember the terms correctly.
- Explain the structures in the ovaries before and after ovulation with diagrams and charts.
- Instruct students to not to draw a single membrane for chloroplast.

MARKING SCHEME

Question 6

(i)	Squeezing / oozing out of WBCs through the walls of capillaries.
(ii)	Diabetes mellitus – Pancreas Diabetes insipidus – Pituitary
(iii)	CO combines with oxygen to form a stable compound – Carboxyhaemoglobin which cuts off the supply of oxygen to tissues. Results in asphyxiation / death.
(iv)	(a) Ovulation (b) Corpus luteum
(v)	

Question 7

- (i) Define the term hormone. [1]
- (ii) Which parts of the ear are responsible for: [2]
- (a) Static equilibrium?
- (b) Dynamic equilibrium?
- (iii) Mention *two* structural differences between an artery and a vein. [2]
- (iv) Write *any two* limitations of using a Ganong's Potometer to demonstrate the uptake of water. [2]
- (v) A teacher drew the diagram of heart on the blackboard and told the students to copy it in their notebooks. Mahesh couldn't see the diagram clearly as it appeared blurred to him. [3]
- (a) Name the defect of the eye Mahesh is suffering from.
- (b) Where is the image formed in this defect?
- (c) Mahesh consults an eye doctor and is prescribed suitable lenses to correct the defect. Which type of lens do his spectacles have?

Comments of Examiners

- (i) Most of the candidates answered correctly. However, some of the candidates did not specify the secretions of endocrine glands and the manner in which hormones were transported.
- (ii) (a) Majority of the candidates answered correctly. However, a few candidates were confused with the functions of semicircular canals and utriculus/sacculus.
- (b) A few candidates answered correctly. However, some candidates wrote only ampulla but did not specify semicircular canals.
- (iii) Most of the candidates answered correctly. However, a few candidates wrote incorrect answers like 'arteries were thick and veins were thin.' Some candidates mentioned the functions of arteries and veins and lost marks.
- (iv) A large number of the candidates answered correctly. However, a few candidates wrote precautions instead of limitations and lost marks.
- (v) (a) Majority of the candidates answered correctly. However, a few candidates wrote 'hyperopia' instead of 'myopia'.

Suggestions for teachers

- Summarise the properties of hormones after having taught the lesson on endocrine glands.
- Differentiate the parts involved for static and dynamic equilibrium in ear by giving real life examples.
- Explain both the location and function of parts of the ear to avoid such confusion.
- Elucidate the structural differences of arteries and veins with appropriate diagrams and charts.
- Clarify the differences between limitations and precautions in practical classes.
- Give a comparative study to differentiate the defects of the eye. Provide a diagrammatic representation of eye defects and their correction to eliminate errors.
- Explain the concept with diagrammatic representation to show the formation of image in myopia and hyperopia.
- Discuss in class the role of concave lens and convex lens to focus the object with diagrams and charts.

- (b) Most of the candidates answered correctly. A few candidates wrote ‘beyond the retina’ instead of ‘before the retina’ and lost a mark.
- (c) Majority of the candidates answered it correctly. However, a few candidates wrote convex lens in place of concave lens.

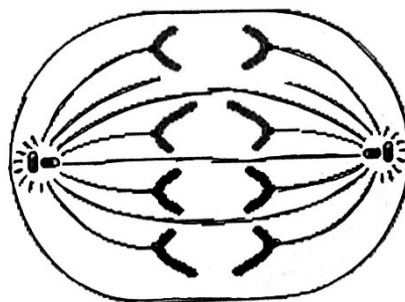
MARKING SCHEME

Question 7

(i)	Secretions of endocrine glands which are transported by blood and act on target organs or cells of the body.
(ii)	(a) Utriculus / Sacculus (b) Semicircular canals
(iii)	Artery – Narrow lumen, thick muscle layer, elastic, valves absent. Vein – Wide lumen, thin muscle layer, non-elastic, valves present.
(iv)	Introducing air bubble is difficult, twig may not remain alive for long, air temperature affects the position of bubble.
(v)	(a) Myopia / short sight / Near sightedness (b) In front of the retina (c) Concave / diverging lens

Question 8

- (i) Define the term ultrafiltration. [1]
- (ii) Name the mineral elements required for: [2]
- (a) Clotting of blood
- (b) Synthesis of thyroxine
- (iii) Mention *two* harmful effects of noise pollution. [2]
- (iv) Why are RBCs efficient in their functions though they lack nucleus and mitochondria? [2]
- (v) The diagram given below represents a stage in mitosis. [3]



- (a) Identify the stage given above.
- (b) Give *one* reason to support your answer in (a).
- (c) Mention the number of chromosomes given in the diagram.

Comments of Examiners

- (i) A large number of the candidates answered it correctly. However, a few candidates did not mention 'glomerulus' and 'filtration of blood under high pressure'.
- (ii) (a) Most candidates answered correctly. However, a few wrote 'vitamin K' instead of 'calcium'.
(b) Majority of the candidates answered it correctly.
- (iii) No errors were found for this question.
- (iv) Majority of the candidates failed to answer both due to carelessness. However, a few candidates answered correctly for nucleus and mitochondria being absent in RBCs.
- (v) (a) Most of the candidates answered correctly. However, a few candidates wrote 'metaphase' and 'prophase' instead of 'anaphase'.
(b) A few candidates answered it correctly. However, many candidates failed to mention that the chromatids are being pulled towards the poles of the cell.
(c) Most of the candidates answered it correctly. However, a few candidates wrote incorrect answers like 2, 16, 23 and 46 and lost the mark.

Suggestions for teachers

- Facilitate periodical revisions to get a clear understanding of concepts.
- Explain the roles of clotting factor, mineral element, vitamin K to build clear understanding.
- Explain the role of Iodine for the production of thyroxin. Quote examples of food that contain iodine.
- Discuss in detail the deficiency of nucleus, mitochondria and endoplasmic reticulum for more efficient function of RBC.
- Elucidate with the help of relevant slides, charts and diagrams the stages of Mitosis.
- Highlight the key words and the important points to identify the stages of mitosis.
- Explain that the most important aspect of mitosis is the same normal chromosome number being maintained in each phase.
- Advise students to study the diagram carefully and ensure practice of such questions.

MARKING SCHEME

Question 8

(i)	Filtration of the liquid part of blood under high pressure in the glomerulus.
(ii)	(a) Calcium / Ca (b) Iodine / I ₂
(iii)	Irritation, headache, interferes in communication, loss of concentration, disturbs sleep, damages eardrum, disturbs bird life. <i>(Any two)</i>
(iv)	Lack of nucleus provides a large surface area for absorption and transportation of oxygen. Lack of mitochondria means that they do not use oxygen and glucose for their respiration, all the oxygen and glucose is transported to tissues.
(v)	(a) Anaphase (b) Chromatids / chromosomes are pulled toward the poles. (c) 4

Note: For questions having more than one correct answer/solution, alternate correct answers/solutions, apart from those given in the marking scheme, have also been accepted.