ICSE Class 10 Biology Question Paper Solution 2019

BIOLOGY (PAPER-3)

SECTION I (40 Marks)

*Attempt **all** questions from this Section*

Question 1

(a) Name the following: [5]

(i) The layer of the eyeball that provides nourishment to the eye.

(ii) One gaseous compound which depletes the ozone layer.

(iii) The structure which connects the placenta and the foetus.

(iv) A pair of corresponding chromosomes of the same shape and size and derived one from each parent.

(v) The compound formed when haemoglobin combines with carbon dioxide in blood.

(b) Correct and *rewrite the statements* by changing the biological term that is underlined for each statement: [5]

(i) The theory of Inheritance of Acquired Characters was proposed by Watson and Crick.

(ii) The protective sac which develops around the developing embryo is called the Pericardium.

(iii) Maintaining balance of the body and coordinating muscular activities is carried out by the cerebrum.

(iv) The kidney is composed of number of neurons.

(v) The part of the eye which can be donated from a clinically dead person is the Retina.

(c) Give suitable *biological reasons* for the following statements: [5]

(i) The birth rate in India is very high.

(ii) Carbon monoxide is dangerous when inhaled.

(iii) Root hairs become flaccid and droop when excess fertilizers are added to the moist soil around them.

(iv) Acid rain is harmful to the environment.

(v) All life on Earth is supported by Photosynthesis.

(d) Match the items given in Column A with the most appropriate ones in Column B and **REWRITE** the correct matching pairs: [5]

	Column A		**Column B**
(i)	Cranial nerves	–	Testosterone
(ii)	Leydig cells	–	Natural reflex
(iii)	Acetylcholine	–	12 pairs
(iv)	Spinal nerves	–	Prolactin
(v)	Sneezing	–	Neurotransmitter
		–	18 pairs
		–	31 pairs
		–	Conditioned reflex

(e) Choose the correct answer from the four options given below: [5]

(i) While recording the pulse rate, where exactly does a doctor press on our wrist?

A. Nerve

B. Vein

C. Artery

D. Capillary

(ii) In a human male, a sperm will contain:

A. Both X and Y chromosomes

B. Only Y chromosome

C. Only X chromosome

D. Either X or Y chromosome

(iii) A muscular wall is absent in:

A. Capillary

B. Venule

C. Arteriole

D. Vein

(iv) On which day of the menstrual cycle does ovulation take place?

A. 5^{th} day

B. 28^{th} day

C. 14^{th} day

D. 1^{st} day

(v) Which one of the following does not affect the rate of transpiration?

A. Light

B. Humidity

C. Wind

D. Age of the plant

(f) Identify the **ODD** term in each set and name the **CATEGORY** to which the remaining three belong: [5]

Example: glucose, starch, cellulose, calcium

Odd term: calcium

Category: others are different types of carbohydrates.

(i) Addison's disease, Cushing's Syndrome, Acromegaly, Leukemia.

(ii) Insulin, Adrenaline, Pepsin, Thyroxine.

(iii) Axon, Dendron, Photon, Cyton.

(iv) Chicken pox, Colour blindness, Haemophilia, Albinism.

(v) Polythene bag, Crop residue, Animal waste, Decaying vegetable.

(g) Expand the following biological abbreviations: [5]

(i) ABA

(ii) IAA

(iii) ATP

(iv) DNA

(v) TSH

(h) Study the picture given below and answer the following questions: [5]

(i) Identify the type of pollution.

(ii) Name one pollutant that causes the above pollution.

(iii) Mention the impact of this pollution on human health.

(iv) State one measure to control this pollution.

(v) What is a 'Pollutant'? Explain the term.

Comments of Examiners

(a) (i) Most candidates named the layer of the eyeball that provides nourishment to the eye correctly. However, some candidates could not spell it correctly.

(ii) Majority of the candidates performed well barring some who were not sure and wrote CO_2.

(iii) Many candidates attempted this sub-part of the question well. However, some spelt it as '*Amblical cord*'.

(iv) Most candidates answered it correctly. However, some wrote *Homozygous* instead of *Homologous*.

(v) Incorrect answer was written by most candidates. They wrote *carboxyhaemoglobin* instead of *carbaminohaemoglobin*.

(b) (i) Most candidates wrote *Mendel* and *Darwin* instead of *Lamarck*.

(ii) This was a well attempted question.

(iii) Most candidates answered this sub-part of the question correctly. However, in several scripts spelling errors were noticed.

(iv) Answered correctly by most candidates.

Suggestions for teachers

- Advise students to read the instructions given for each question carefully.
- Explain the parts and functions of eye and brain using charts, models and interactive boards.
- Clarify the difference between carboxyhaemoglobin and carbaminohaemoglobin, Endosmosis and Exosmosis.
- Emphasise on the discoveries made by Watson and Crick, Mendel, Lamarck and Darwin.
- Acquaint students with the hormones secreted by endocrine glands and the disorders caused due to their Hypo and Hyper secretions.

(v) Majority of the candidates answered correctly. However, a few candidates wrote *Choroid* instead of *Retina*.

(c) (i) Most candidates wrote the correct biological reason for the given statement.

(ii) Most of the candidates were vague in their answers. Supply of oxygen to tissues being cut off, was not mentioned by many candidates.

(iii) Many candidates wrote the correct reason. However, some could not explain using technical terms.

(iv) A valid reason was given by most candidates.

(v) Majority of the candidates wrote the correct reason. A few could not give the significance of food and O_2 provided by green plants.

(d) Most candidates wrote correct matching pairs of items given in column A and B. However, a few candidates were not sure of the number of *Cranial nerves* and *Spinal nerves*.

(e) (i) Most of the candidates wrote the correct option. Some wrote *vein* instead of *artery*.

(ii) Majority of the candidates wrote incorrect options. They were unaware that sperms are of two types.

(iii) Most candidates chose the correct answer from the given options.

(iv) The correct answer was written by most candidates.

(v) All candidates wrote the correct option.

(f) (i) Most candidates were able to identify the odd term but could not identify the category correctly.

(ii) Most candidates answered correctly.

(iii) Answered correctly by most candidates.

(iv) The odd term was identified correctly, but the category was mentioned as *eye diseases* by many candidates.

(v) This subpart of the question was well attempted.

(g) (i) Many candidates could not spell *Abscisic acid* correctly.

(ii) Many candidates were not sure of the abbreviation IAA and hence wrote *Indone* for *Indole* and did not mention the number *'3'*.

(iii) Most candidates wrote the correct answer.

(iv) Several candidates wrote the correct answer. However, some candidates wrote *dioxy* for *deoxy*.

(v) Majority of the candidates answered correctly. However, a few wrote *Thyroxine* for *Thyroid*.

- Explain the number of cranial and spinal nerves.
- Advise students to practice the diagrams of stomatal apparatus and the experiment to prove that O_2 is released by green plants during photosynthesis.
- Insist upon learning the correct spellings of the biological terms with their correct meaning.
- Explain to the students to differentiate between
  - placenta and umbilical cord.
  - homologous chromosomes and homozygous condition along with the meanings of 'zygous' and 'logous.'
  - the location of amnion and amniotic fluid.
  - Neuron and Nephron by drawing the attention of the students to the fact that Neuron is the fundamental unit of the nervous system while, Nephrons are units of the kidney.
- Discuss in detail the concept of osmosis, exosmosis and endosmosis. with relevant examples of plant cells being subjected to hypertonic and hypotonic mediums/solutions.
- Point out the difference between the natural reflexes and conditioned reflexes giving relevant examples.
- Giving application-based problems in the class regularly.
- Clarify to the students that all ova/egg contain only X chromosome, while, sperms may contain either X or Y chromosome. Thus, teach the concept of sex determination in humans clearly.
- Clarify menstrual cycle with all the four phases with appropriate diagrams.
- Teach clearly the difference between communicable diseases and hereditary diseases.

(h) (i) The type of pollution was identified correctly by all candidates.
(ii) This subpart of the question was answered correctly by most candidates.
(iii) Most candidates answered correctly.
(iv) Majority of the candidates answered correctly.
(v) Most of the candidates could not explain the term *pollutant*. 'Causes Pollution' was the vague answer written by many candidates.

MARKING SCHEME

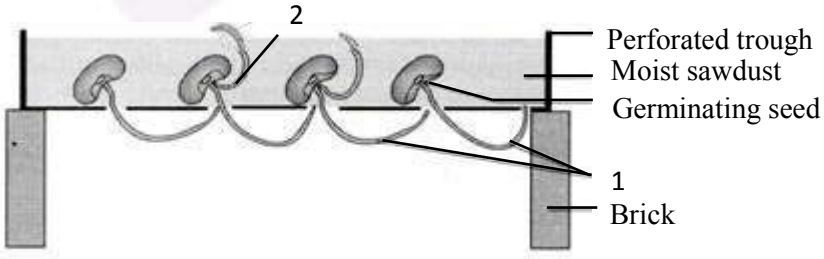
Question 1

(a)	(i) Choroid (ii) Chlorofluorocarbon (CFC) or carbon tetrachloride (iii) Umbilical cord (iv) Homologous chromosomes (v) Carbaminohaemoglobin/$HbCO_2$
(b)	(i) Jean-Baptiste Lamarck (ii) Amnion (iii) Cerebellum (iv) Nephrons/ Uriniferous tubules (v) Cornea
(c)	(i) Illiteracy, children are a gift of God, sign of prosperity, due to high infant mortality, more helping hands for family income, do not accept family planning methods, desire for a male child, lack of recreation. (ii) Easily combines with haemoglobin to form carboxyhaemoglobin which cuts off supply of oxygen to tissues. (iii) Formation of hypertonic solution which results in plasmolysis / exosmosis. (iv) Pollutes soil, damages vegetation, buildings, statues, monuments, kills fish and aquatic animals. (v) All organisms depend directly or indirectly on green plants for food, beginning of all food chains, provides oxygen for respiration. ***(Any alternate correct answer)***
(d)	(i) Cranial nerves – 12 pairs (ii) Leydig cells – Testosterone (iii) Acetylcholine – Neuro transmitter (iv) Spinal nerves – 31 pairs (v) Sneezing – Natural reflex
(e)	(i) C. Artery (ii) D. Either X or Y chromosome (iii) A. Capillary (iv) C. 14th day (v) D. Age of the plant

(f)	(i) O – Leukemia C – Hormonal / Endocrinal disorders (ii) O – Pepsin C – Hormones (iii) O – Photon C – Parts of neuron / nerve cell (iv) O – Chicken pox C – Genetic diseases (v) O – Polythene bag C – Biodegradable wastes
(g)	(i) Abscisic acid (ii) Indole 3-acetic acid (iii) Adenosine triphosphate (iv) Deoxyribo nucleic acid (v) Thyroid stimulating hormone
(h)	(i) Water pollution/ Marine pollution (ii) Detergents, sewage, domestic waste, oil spills from tankers, industrial wastes, hot water from thermal power plants, polythene covers, plastic bottles, dead bodies, insecticides, etc. (iii) Enters food chain to harm health, cause diseases like typhoid, dysentery, jaundice, skin allergies, etc. (iv) Treating industrial wastes and sewage before letting into water bodies, recycling plastic, metal and glass material (v) Any constituent that harms the environment / deteriorates the natural quality of air, water, soil. *(Any alternate correct answer)*

Question 2

(a) Given below is an experimental setup to demonstrate a particular tropic movement in germinating seeds. Study the diagram and answer the questions that follow: [5]



(i) Label the parts 1 and 2.

(ii) Name the tropic movement shown by part 1.

(iii) Part 1 is affected by two stimuli. Name them.
Which one of the two is stronger?

(iv) What is Thigmotropism? Give one example.

(v) What is meant by 'Positive' and 'Negative' tropic movements in plants?

(b) Mention the exact location of the following: [5]

(i) Testis

(ii) Incus

(iii) Thylakoids

(iv) Amniotic fluid

(v) Corpus callosum

Comments of Examiners

(a) (i) Most of the candidates labelled the parts 1 and 2 correctly. However, some candidates labelled the parts as, *root* and *shoot*, respectively.

(ii) The tropic movement shown by part 1 was named correctly by most candidates.

(iii) Most candidates wrote the tropic movements instead of the *stimuli*.

(iv) Most of the candidates answered this subpart correctly. However, some candidates wrote the example of Nastic movements which was incorrect.

(v) Majority of the candidates answered correctly. A few were unable to give a clear differentiation between the *'Positive' and 'Negative' tropic movements in plants*.

(b) In sub-parts(ii)-(iv), most of the candidates wrote the exact location of the asked questions. However, in sub-parts (i), and (v), many candidates could not give the exact location. They wrote vague answers such as, *outside the abdomen* in subpart (i) and *in the brain, in the cerebrum* in subpart (v)

Suggestions for teachers

- Give a simplified explanation of Tropic movements in plants.
- Explain the difference between Tropic movement and stimulus, Positive and negative tropic movements.
- Give suitable examples for tropic movements.
- Emphasise on the importance of prepositions while teaching the exact location of organs and structures.
- Clarify to the students the difference between
  - radicle and root, plumule and shoot.
  - corpus callosum and corpus luteum.

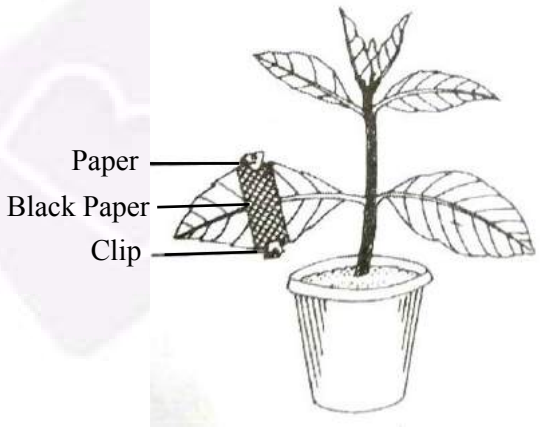
MARKING SCHEME

Question 2

(a)	(i) 1. Radicle 2. Plumule (ii) Hydrotropism (iii) Gravity, water / moisture Water is stronger (iv) Movement of plant in response to touch stimulus. Pea, Vines, Cuscuta, cucumber (v) Movement towards stimulus is positive. Movement away from stimulus is negative.
(b)	(i) Inside scrotal sac (ii) Middle ear / between malleus and stapes (iii) In chloroplast (iv) Between amnion and foetus / surrounds the foetus (v) Between the cerebral hemispheres.

Question 3

(a) The diagram given below represents an experiment to prove the importance of a factor in photosynthesis. Answer the questions that follow: [5]



(i) Name the factor studied in this experiment.

(ii) What will you observe in the experimental leaf after the starch test?

(iii) Explain the process of Photosynthesis.

(iv) Give a balanced chemical equation to represent the process of photosynthesis.

(v) Draw a neat, labelled diagram of an experimental setup to show that oxygen is released during photosynthesis.

(b) State the main functions of the following: [5]

(i) Medulla Oblongata

(ii) Cytokinins

(iii) Tears

(iv) Coronary Artery

(v) Seminal Vesicles

Comments of Examiners

(a)(i) Most candidates did not name the factor studied in the asked experiment. They wrote the *process* instead of the *factor*.

(ii) Many candidates could not give a clear explanation of the starch test. They did not specify the colour change in the covered and uncovered parts of the experimental leaf.

(iii) Majority of the candidates explained the process of Photosynthesis.

(iv) Most candidates wrote the correct equation. A few balanced it by taking $6H_2O$ instead of $12H_2O$.

(v) Most candidates drew an incorrect diagram using a mouse and bell jar instead of taking a hydrilla plant submerged in water.

(b) (i) Few candidates stated the main function of Medulla Oblongata correctly. Majority of them confused it with the function of cerebellum.

(ii) Most candidates answered correctly.

(iii) This was correctly answered by most candidates.

(iv) Most candidates wrote incomplete answers. They did not specify *oxygenated blood*.

(v) Majority of the candidates wrote the correct answer. A few wrote the function of testis instead of seminal vesicles.

Suggestions for teachers

- While teaching starch test in Photosynthesis emphasise on the colour change in the parts of the experimental leaf.
- Advise students to practice the chemical equation for Photosynthesis.
- Guide students that any factor tested for an experiment needs to be proved at the end. Hence, using a mouse and plant under a bell jar cannot prove the release of O_2 during photosynthesis since oxygen cannot be tested. Instruct students to setup the experiment using twigs of hydrilla to prove the release of oxygen.
- Clarify the difference between the *factor* and the *process* studied in an experiment.
- Ensure that students are clear about the main functions of the structures asked in the question paper.

MARKING SCHEME

Question 3

(a)

(i) Sunlight

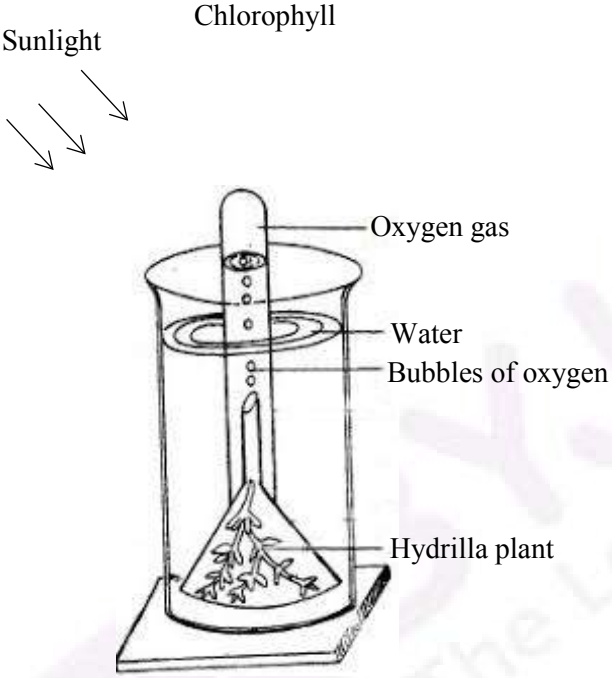
(ii) – Part of leaf covered by black paper turns brown, absence of starch.

– Parts of leaf exposed to sunlight turns blue black, presence of starch.

(iii) Plant cells having chlorophyll, use water and carbon dioxide to produce glucose in the presence of sunlight.

(iv) $6CO_2 + 12H_2O \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} C_6H_{12}O_6 + 6H_2O + 6O_2$

(v)



(b)

(i) Regulates activities of internal organs like breathing, heartbeat, peristalsis.

(ii) Stimulates cell division, plant growth, prevents ageing,expansion of cotyledons in seeds,breaks seed dormancy, promotes synthesis of chloroplasts, delays senescence.

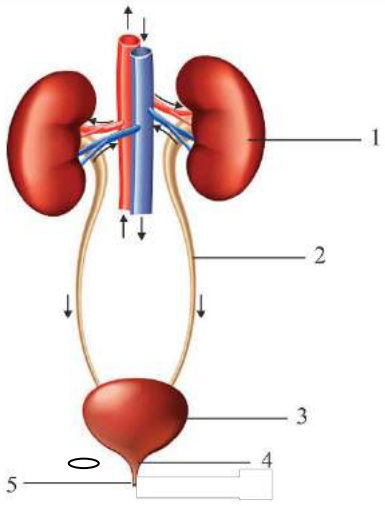
(iii) Lubricates surface of eye, washes away dust, kill germs, keeps surface of eye moist, lysozyme kills bacteria.

(iv) Supplies oxygenated blood to the walls of the heart.

(v) Activates sperms, forms a medium for transportation of sperms.

Question 4

(a) The diagram given below represents an organ system in the human body. Study the same and answer the questions that follow: [5]



(i) Identify the system.

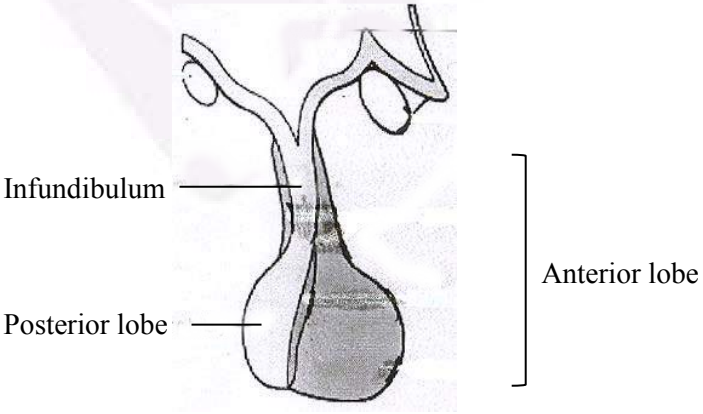
(ii) Label the parts marked 2 and 4. Mention the function of part 5.

(iii) Name the structural and functional units of the part marked 1.

(iv) What is the fluid that accumulates in part 3?
Which is the main nitrogenous waste present in it?

(v) Draw a neat, labelled diagram showing the longitudinal section of part 1.

(b) The diagram given below represents an endocrine gland in the human body. Study the diagram and answer the following questions: [5]



(i) Identify the endocrine gland. Where is it located?

(ii) Why is the above gland referred to as the 'Master gland'?

(iii) Name the hormone which in deficiency causes Diabetes Insipidus.

How does this disorder differ from Diabetes Mellitus?

(iv) Explain the term 'Hormone'.

What is the role of Tropic hormones in the human body?

(v) Which lobe of the above gland secretes:

1. Oxytocin
2. ACTH
3. Growth hormone

Comments of Examiners

(a) (i) Most candidates identified the system correctly. 'Urinogenital system' was written as an incorrect answer by a few candidates.

(ii) Most candidates labelled part 2 and 4 and mentioned the function of part 5 correctly. However, a few did not study the diagram carefully and labelled part 4 as *urethra.*

(iii) This part of the question was answered correctly by most candidates.

(iv) Majority of the candidates wrote the name of the fluid that accumulates in part 3 correctly. However, some candidates could not mention the main nitrogenous waste present in urine.

(v) The longitudinal section of part 1 was drawn correctly by most candidates. However, a few candidates could not show a clear differentiation between renal cortex and medulla.

(b) (i) Most candidates identified the endocrine gland correctly. However, a large number of candidates could not give the exact location of the gland.

(ii) Most candidates answered this subpart correctly.

(iii) This subpart was attempted well by most candidates.

(iv) Majority of the candidates explained the term 'Hormone' correctly but were unable to give the role of Tropic hormones in the human body.

(v) Many candidates wrote incorrect answers as they were uncertain of the hormones secreted by the two lobes of the Pituitary gland.

Suggestions for teachers

- Familiarise students with the parts and functions of the Urinary system.
- Encourage students to draw neat, labelled and accurate diagrams showing all parts clearly.
- Explain the location of the Pituitary gland with the help of a suitable/interactive board.
- Interpret the differences between the two types of Diabetes with respect to hormones and symptoms. Also clarify the keywords *mellitus* and *insipidus*.
- Explain to the students the difference between an organ and an organ system.
- Give a list of organic and inorganic constituents of urine.
- Give a comparison of the four endocrine glands, their secretion, disorders caused due to hyposecretion and hypersecretion.

MARKING SCHEME

Question 4

(a)

(i) Excretory system/Urinary system

(ii) 2 – Ureter

4 – Sphincter

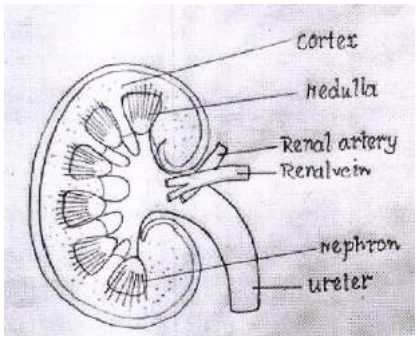
5 – Expels urine

(iii) Nephrons

(iv) Urine

Urea

(v)



(Any other correct labelling)

(b)

(i) Pituitary gland

Hangs from hypothalamus

(ii) Controls the secretions of other endocrine glands/regulates the activities of other endocrine glands.

(iii) Vasopressin / ADH

Diabetes mellitus is due to deficiency of insulin/ high level of sugar in blood, urine has sugar.

Diabetes insipidus: Normal sugar in blood, urine free of sugar / urine loaded with water.

(iv) It is the secretion of an endocrine gland, which is transported by blood and acts on target organs or cells.

Secreted by pituitary gland and stimulates other endocrine glands to secrete their hormones.

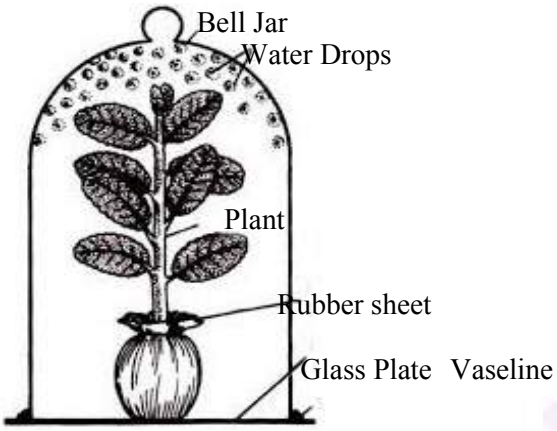
(v) 1 – Posterior/ neurohypophysis

2 – Anterior / adenohypophysis

3 – Anterior /adenohypophysis

Question 5

(a) Given below is an apparatus which was setup to investigate a physiological process in plants. The setup was placed in bright sunlight. Answer the questions that follow: [5]



(i) Name the process being studied. Define the process.

(ii) Why was the pot enclosed in a rubber sheet?

(iii) Mention two external factors which can accelerate the above process.

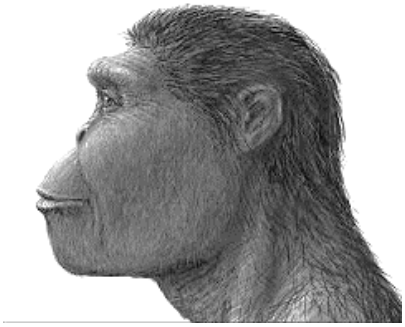
(iv) List two adaptations in plants to reduce the above process.

(v) Draw a neat, labelled diagram of a stomatal apparatus.

(b) Given below are two stages in the evolution of man. [5]

Study them and answer the questions that follow:

A



B

(i) Identify Australopithecus and Neanderthal man from the above pictures.

(ii) Mention two characteristic features each for the two stages.

(iii) Who proposed the theory of 'Natural Selection'?

(iv) Name the organism used as an example to explain 'Industrial Melanism'.

(v) Give two examples of Vestigial organs in humans.

Comments of Examiners

(a) (i) Most candidates answered correctly. However, a few wrote *Photosynthesis* instead of *Transpiration.*

(ii) Few candidates could attempt this subpart correctly. Most of them wrote that transpiration occurs in soil, which is incorrect.

(iii) Though most candidates wrote the external factors, they failed to mention their intensity which will accelerate the process.

(iv) Majority of the candidates listed the two adaptations in plants correctly.

(v) Few candidates drew a neat, labelled diagram of a stomatal apparatus. Most candidates did not draw epidermal cells surrounding the guard cells.

(b)(i) Most candidates identified the pictures correctly.

(ii) Most candidates wrote the two characteristic features each for the two stages correctly.

(iii) Many candidates were unsure of the name of the scientist who proposed Natural Selection. They wrote Lamarck instead of Darwin.

(iv) Most candidates could not write the common name or scientific name of the organism.

(v) Most candidates wrote the two examples of Vestigial organs in humans correctly.

Suggestions for teachers

- Train students in conceptual learning. Advise students to take practical work seriously, to understand the difference between Transpiration and Photosynthesis. Insist on drawing complete diagrams.
- Clarify the importance of epidermal cells surrounding guard cells.
- Instruct students to express the acceleration of physiological processes in plants using adverbs such as "more or less".
- Advise students to comprehend what is asked in the question before answering.
- Explain the difference between a duct and a tubule.
- Teach Human Evolution giving basic characteristics of each stage. Illustrate each stage using pictorial representation of models of evolution of man exhibiting the characteristic feature of the various stages of human evolution.
- Spell out Lamarck's and Darwin's contribution towards study of evolution clearly.
- Explain the meaning of vestigial organ clearly with many examples pertaining to human beings.

MARKING SCHEME

Question 5

(a)

(i) Transpiration

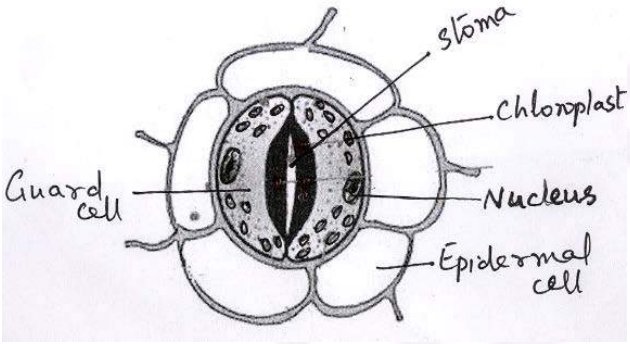
It is the loss of water as water vapour from the aerial parts of the plant.

(ii) To prevent evaporation of water from the pot/ soil.

(iii) Bright sunlight, high temperature, high velocity of wind, low humidity.

(iv) Thick cuticle, loss of leaves, narrow leaves, fewer stomata, sunken stomata, leaves modified into spines, multiple layers of epidermal cells.

(v)



(b)

(i) A – Neanderthal man

B – Australopithecus

(ii) A – absolute bipedalism, large head, broad, flat, sloping forehead, less hair on body, large cranial capacity 1,500 cm^3,

B – Protruding face, Chin absent, prominent eyebrow ridges, flat nose, projecting face, cranial capacity (450- 600 cm^3).

(Any other correct characteristic feature.)

(iii) Charles Darwin

(iv) Peppered moth / Biston betularia

(v) Pinna of ear, wisdom teeth, vermiform appendix, coccyx or tailbone, arrector pili, plica semilunaris, body hair, male nipples.

Question 6

(a) In Mendel's experiments, tall pea plants (T) are dominant over dwarf pea plants (t). [5]

(i) What is the phenotype and genotype of the F_1 generation if a homozygous tall plant is crossed with a homozygous dwarf plant?

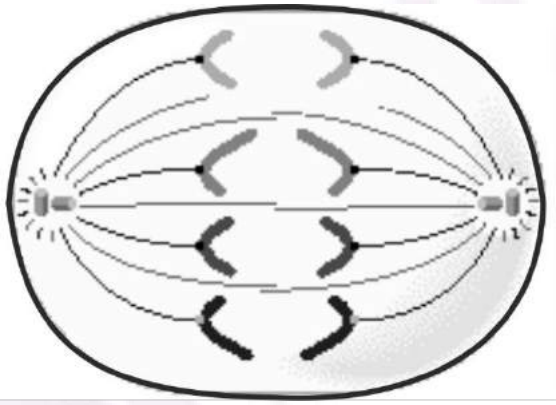
(ii) Draw a Punnett square board to show the gametes and offspring when both the parents are heterozygous for tallness.

(iii) What is the phenotypic ratio and genotypic ratio of the above cross in (ii)?

(iv) State Mendel's Law of Dominance.

(v) What is a Dihybrid Cross?

(b) Given below is a diagram representing a stage during the mitotic cell division. Study the diagram and answer the following questions: [5]



(i) Identify the stage by giving a suitable reason.

(ii) Is it a plant or an animal cell? Give a reason to support your answer.

(iii) Draw a neat, labelled diagram of the stage which follows the one shown in the diagram.

(iv) How many chromosomes will each daughter cell have after the completion of the above division?

(v) Name the four nitrogenous bases.

Comments of Examiners

(a) (i) Most candidates answered correctly. However, a few mentioned shapes of seed and position of flower instead of height of plant.

(ii) Many candidates drew the Punnett square. A few used a criss-cross method to answer.

(iii) Most candidates wrote phenotypic ratio and genotypic ratio of the above cross in (ii) correctly.

(iv) Majority of the candidates stated Mendel's Law of Dominance correctly.

(v) Most candidates could explain Dihybrid cross. However, a few confused it with Monohybrid cross.

(b) (i) Majority of candidates could identify the stage during the mitotic cell division correctly but could not give a valid reason.

(ii) This part of the question was answered correctly by most candidates

(iii) Many candidates did not draw the correct diagram of Telophase. Daughter nuclei with nuclear membrane was not shown.

(iv) Majority of the candidates wrote 46 chromosomes instead of 4 as they did not observe the diagram properly.

(v) Most candidates named the four nitrogenous bases correctly. A few wrote *Thiamine* and *Adenosine* as incorrect answers.

Suggestions for teachers

- Train students to clearly distinguish between Chromosome and Chromatid.
- Draw diagrams on the blackboard to help students comprehend and develop the required skill.
- Give a clear understanding of technical terms like Phenotype, Genotype, Phenotypic ratio and Genotypic ratio.
- Stress upon the difference between Monohybrid and Dihybrid cross, F_1 and F_2 generations.
- Explain the stages of mitosis with the help of well labelled diagrams.
- Lay importance on the position and number of chromosomes in the diagrams.
- Train students to draw labelled diagrams of the phases of mitosis in animal cells and plant cells.
- Instruct students to maintain number of chromosomes in the diagrams drawn for mitosis.
- Give regular practice by giving similar type of questions in unit tests/terminal examinations and clarify the errors.

MARKING SCHEME

Question 6

(a)

(i) Phenotype – all are tall plants

Genotype – All are hybrid / heterozygous dominant

(ii)

	T	t
T	**TT**	**Tt**
t	**Tt**	**tt**

(iii) Phenotypic ratio – 3 : 1

Genotypic ratio – 1 : 2 : 1

(iv) Out of a pair of contrasting characters, the one that is expressed is dominant and the one that is not expressed is recessive.

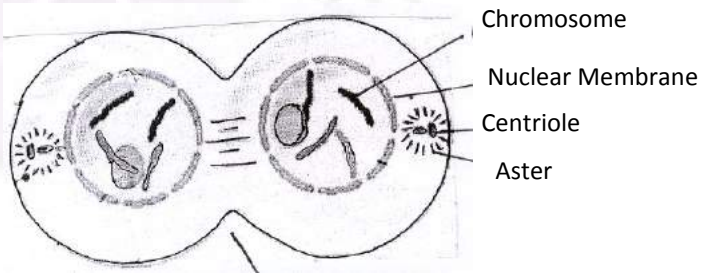
(v) It is breeding plants taking two pairs of contrasting characters.

(b)

(i) Anaphase
Chromatids are being pulled towards the opposite poles.

(ii) Animal cell
Cell wall is absent, centrioles are present, asters are present.

(iii)



(iv) 4

(v) Adenine, Thymine, Cytosine, Guanine.

Question 7

(a) Answer the following questions briefly: [5]

(i) How are the cytons and axons placed in the brain and the spinal cord?

(ii) Which part of the human ear gives 'Dynamic balance' and 'Static balance' to the body?

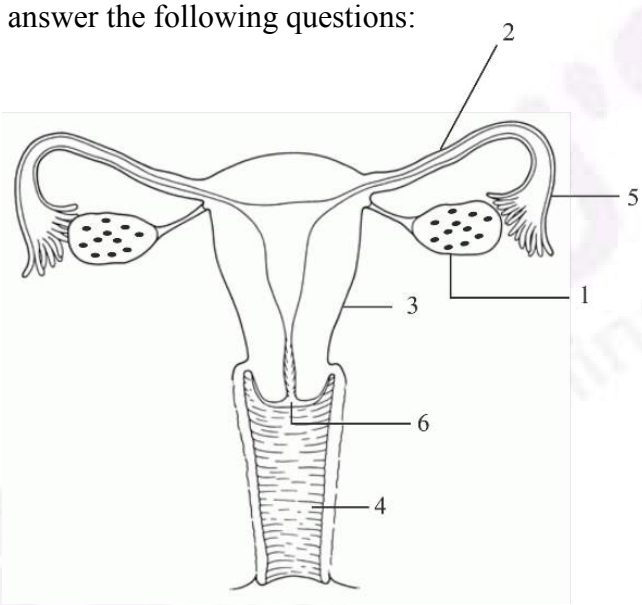
(iii) Explain how the human eye adapts itself to bright light and dim light.

(iv) What is Parthenocarpy? Give one example.

(v) Mention any two objectives of 'Swachh Bharat Abhiyan'.

(b) The diagram given below represents a system in the human body. [5]

Study the diagram and answer the following questions:



(b) (i) Identify the system. [5]

(ii) Label the parts marked 5 and 6.

(iii) Name the two hormones secreted by 1.

(iv) Mention the number and the name of the part involved in fertilization and implantation from the above diagram.

(v) Mention the surgical methods of contraception in:

1. Human males.

2. Human females.

Comments of Examiners

(a) (i) Most candidates wrote incorrect answers. They were unsure of the placement of cytons and axons in brain and spinal cord.

(ii) Majority of the candidates answered this sub part of the question correctly.

(iii) Few candidates wrote correct answers. Many candidates did not write the role of *rhodopsin* for adaptation of eye.

(iv) Most candidates could not give a clear explanation of the term 'Parthenocarpy'. However, the example was written correctly by some candidates.

(v) Most candidates mentioned the two objectives of 'Swachh Bharat Abhiyan' correctly.

(b) (i) Most candidates wrote the correct answer. A few candidates did not mention the word *female* while identifying the system.

(ii) Majority of the candidates labelled part 5 correctly. However, part 6 was identified as Vagina instead of Cervix.

(iii) Most candidates wrote the names of the two hormones secreted by 1 correctly.

(iv) Majority of the candidates did not write the number and name of the part involved in fertilization and implantation.

(v) Most candidates answered correctly the surgical methods of contraception in Human males and females.

Suggestions for teachers

- Give a clear understanding of the structure and functions of the parts of ear and eye using charts, models and interactive boards.
- Explain the arrangement of Cytons and Axons, Grey matter and white matter in brain and spinal cord.
- Teach the functions of sensory cells of retina, emphasising on the pigments of rods and cones and their function in bright and dim light.
- Advise students to comprehend the definitions/ operative terms and then learn.
- Use neatly labelled diagrams and charts to explain the parts of the male and female reproductive system. Stress on the location and function of various parts.
- Teach in detail the definition, site and physiology of fertilization, implantation and gestation.
- Clarify Vasectomy and Tubectomy with suitable illustrations.

MARKING SCHEME

Question 7

(a)	(i) Brain - Outer, grey matter has cytons and inner white matter has axons. Spinal Cord - Outer, white matter has axons and inner grey matter has cytons. (ii) Dynamic - semi-circular canals/ducts/tubes Static - utriculus, sacculus, utricle, saccule, vestibule (iii) Bright light - Pupils constrict, Rhodopsin is bleached. Dim light - Pupils dilate, Rhodopsin is regenerated.

	(iv) Formation of fruit without fertilisation e.g. grapes, water melon, banana, papaya. (v) – To clean roads, streets and buildings in cities and towns. – To eliminate open defecation – To build and monitor the use of latrines – To manage solid and liquid waste
(b)	(i) Female reproductive system (ii) 5 – Oviducal funnel 6 – Cervix (iii) Oestrogen, Progesterone. (iv) Fertilisation – 2, Oviduct/Fallopian tube Implantation – 3, Uterus (v) 1 – Vasectomy 2 – Tubectomy

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.