ICSE Board
Class X Biology
Sample Paper – 11 Solution

Time: 2 hrs **Total Marks: 80**

SECTION-I

Answer 1

(a)

(i) Testosterone
(ii) Renal artery
(iii) Lymph
(iv) Oxygen
(v) Flaccid

(b)

(i) True.
(ii) False. Abscisic acid is a growth retarding hormone.
(iii) False. Oestrogen produces female sexual characters.
(iv) False. Bleeding is the exudation of plant sap from the injured parts of the plant.
(v) True.

(c)

(i) Serum
(ii) Imbibition
(iii) Meiosis
(iv) Monohybrid cross
(v) Menopause

(d)

SET	Odd Term	Category
i. Dendrite, Cyton, Axon, Macula	Macula	Parts of the neuron
ii. ADH, TSH, NADPH, ACTH	NADPH	Hormones secreted by the pituitary gland
iii. Incus, Stapes, Malleus, Eustachian tube	Eustachian tube	Ear ossicles
iv. Stoma, Stroma, Granum, Thylakoids	Stoma	Structures of the chloroplast
v. Skin, Saliva, Sweat, Tears	Skin	Germ-killing secretions of the body

(e)

(i) Endocrine glands: thyroid, pancreas
(ii) Parthenocarpic fruits: pineapple, banana
(iii) Phytohormones: auxin, cytokinin
(iv) Hereditary traits: eyebrows - thin/thick, ear lobes - free/attached
(v) Diseases caused by bacteria: cholera, diphtheria

(f)

(i) Difference between autosomes and sex chromosomes.

Autosomes	Sex Chromosomes
Autosomes are 22 pairs of chromosomes responsible for various traits in an organism.	Sex chromosomes are a single pair of chromosomes involved in reproduction and sex determination in an organism.

(ii) Difference between corpus callosum and corpus luteum.

Corpus callosum	Corpus luteum
Corpus callosum is a sheet of fibres connecting the two cerebral hemispheres.	Corpus luteum is a yellow mass formed after the release of the mature ovum during ovulation.

(iii) Difference between afferent arteriole and efferent arteriole.

Afferent arteriole	Efferent arteriole
Afferent arteriole is the blood vessel with a wider lumen which transports blood to the glomerulus.	Efferent arteriole is the blood vessel with a narrow lumen which carries blood from the glomerulus.

(iv) Difference between plasmolysis and deplasmolysis.

Plasmolysis	Deplasmolysis
During plasmolysis, cells shrink when placed in hypertonic solution.	During deplasmolysis, cells distend and become turgid when placed in hypotonic solution.

(v) Difference between auxins and cytokinins.

Auxins	Cytokinins
Auxins are synthesized primarily in shoots.	Cytokinins are synthesized primarily in roots.
Promote cell elongation.	Stimulate cell division and cell enlargement.

(g)

(i) Myopia is a defect of the eye in which the optic axis of the eye becomes too short.
(ii) Homo sapiens is the scientific name of man.
(iii) Short-sightedness can be corrected by using concave lens.
(iv) The pancreas produces the insulin hormone.
(v) The embryo inside the uterus is protected from mechanical injury by the amniotic fluid.

(h)

(i) 1. Afferent arteriole
2. Efferent arteriole
3. Glomerulus
4. Bowman's capsule
(ii) The lumen of the afferent arteriole is wider than the lumen of the efferent arteriole.
(iii) Ultrafiltration
(iv) Glomerular filtrate

SECTION-II

Answer 2

(a)

(i) Photosynthesis is an anabolic process by which plants manufacture their food in the form of carbohydrates by using water and carbon dioxide in the presence of sunlight and chlorophyll. They release oxygen as a byproduct during this process.

(ii) A balanced chemical equation for photosynthesis is:

$$6CO_2 + 12H_2O \xrightarrow[\text{chlorophyll}]{\text{light energy}} C_6H_{12}O_6 + 6H_2O + 6O_2 \uparrow$$

(iii) In plants, glucose is stored in the form of starch.

(iv) Light dependent phase or light reaction and light independent phase or dark reaction are the two phases of photosynthesis.

(v) Palisade parenchyma is the immediate layer after the upper epidermis of the leaf. It contains a large number of chloroplasts and hence, is able to trap a large amount of light.

(b)

(i) The aim of the experiment is to demonstrate the phenomenon of transpiration in plants.

(ii) Transpiration is the loss of water in the form of water vapour from the aerial parts of the plant.

(iii) After some time, tiny water droplets are seen deposited on the inner side of the polythene bag.

(iv) A control for this experiment is an empty polythene bag without the plant with its mouth tied and kept in the sunlight.

Answer 3

(a)

(i) The pancreas secretes digestive juices which are the secretions of the gland. The pancreatic juice is sent to the duodenum through the pancreatic duct. The pancreas also secretes insulin, glucagon and somatostatin which are the secretions of cells known as 'Islets of Langerhans'. They directly pour their secretions into the blood. Therefore, the pancreas is both, an exocrine as well as an endocrine gland.

(ii) To get accurate results from any experiment on photosynthesis, it is important that the plants do not have any starch content. The plants can be destarched only when they are kept in the dark so that photosynthesis stops and the plants utilise all the stored starch.

(iii) Green plants prepare their own food by using carbon dioxide and water in the presence of sunlight and chlorophyll. Therefore, green plants are called producers.

(iv) The presence of a thick cuticle reduces the loss of water from the surface of leaves. Banyan trees are very huge and broad and contain a large number of leaves. In order to regulate the rate of transpiration and loss of water, the leaves of the banyan trees are coated with a thick cuticle.

(v) At higher temperatures, the warm air in the atmosphere can hold more water. So, the rate of transpiration also increases. Therefore, when the temperature is high, the rate of transpiration is also high.

(b)

(i) Diabetic patient – glucose (substance present in excess in the urine)
(ii) Stomata – oxygen (gas given out during the day)
(iii) Spinal cord - centre for reflex action (function)
(iv) Cochlea - internal ear (location)
(v) Neuron - transmit impulses from the sensory organs to the central nervous system and vice versa (function)

Answer 4

(a)

(i) The process of focusing the eye for clear vision at different distances is called power of accommodation of the eye.

(ii) (1) During near vision, the shape of the lens is round or convex.
(2) During distant vision, the shape of the lens is flattened or thinner.

(iii) The two structures that are responsible for bringing about a change in the shape of the lens are ciliary muscles and suspensory ligaments.

(iv) (1) In the dark, the rod cells and their pigment, visual purple or rhodopsin gets activated.
(2) In the light, the cone cells and their pigment, iodopsin gets activated.

(b)

(i) Main characteristics of *Homo sapiens sapiens*:

1. Bipedal locomotion with four reversed curves in the spine.
2. Steep forehead and reduced brow ridges.
3. Cranial capacity ranging from 1450-1600 cm^3.
4. Well developed and prominent chin.

(ii)

Organ	Sympathetic system	Parasympathetic system
(1) Heart	Accelerates heartbeat	Retards heartbeat
(2) Pupil of the eye	Dilates the pupil	Constricts the pupil
(3) Salivary gland	Inhibits secretion of saliva	Stimulates secretion of saliva

Answer 5

(a)

(i) 1. Frontal lobe
2. Temporal lobe
3. Occipital lobe
4. Cerebellum
5. Medulla oblongata

(ii) Function of part 4 (Cerebellum) – It coordinates muscular activity and maintains the balance of the body.
Function of part 5 (Medulla oblongata) – It controls the activity of the internal organs such as heartbeat, respiration etc.

(iii) The outer part of the brain contains grey matter, i.e., the cytons of neurons and the inner part contains white matter, i.e., the axons of neurons.

(iv) A bony box called the cranium protects the brain from external injuries. Inner to the cranium, lie three layers of meninges, duramater, arachnoid and piamater. The space between the meninges and the cavities of the brain contain cerebrospinal fluid which protects the brain from any mechanical injury.

(b)

	Function
(i) Aqueous humour	1. Maintains the shape of the eyeball. 2. Provides nourishment to the lens and cornea.
(ii) Aorta	1. Carries oxygenated blood from the heart to the other parts of the body.
(iii) Ethylene	1. Induces fruit ripening. 2. Promotes senescence.
(iv) Medulla oblongata	1. Controls the involuntary activities of the body such as heartbeat, respiration etc.
(v) Spindle fibres	1. Hold the chromosomes in position during cell division and also pull the chromosomes towards the poles during anaphase.

Answer 6

(a)

	Location	Function
Neurilemma	Present on neuron; it covers the axon	It protects the axon and also prevents the leakage of impulses.
Meninges	Cover the brain	It protect the brain from jerks.
Macula	Present laterally to the yellow spot on the nasal side in the eye.	It is the point of no vision. Nerve fibres of all the sensitive cells of the retina converge here and leave the eyeball in the form of an optic nerve.
Genes	Present on chromosomes	They transfer genetic information from the parents to the offspring.
Thylakoids	In the chloroplast	They help in trapping light energy during photosynthesis.

(b)

(i) Principles of Lamarck's theory of inheritance:
1. Use and disuse
2. Inheritance of acquired characters

(ii) Haemophilia and colour blindness are two sex-linked inherited diseases. These are caused due to the expression of recessive genes present on the 'X' chromosome.

(iii) Significance of meiosis:
1. Due to crossing over, progeny with several variations can be produced. This also provides scope for evolution.
2. The chromosome number of a species is kept constant.

(iv) Advantages of a small family:
1. There is no economic pressure on the parents.
2. All the children get quality education.
3. The overall standard of living of such families improves.

Answer 7

(a)

(i) The heart is undergoing atrial systole.

(ii) The heart is undergoing atrial systole because:

1. The cuspid valves are open.
2. The semilunar valves are closed.
3. The muscular walls of both the atria are in contracted state.

(iii) Double Circulation: The passing of blood twice through the heart is called double circulation. It involves pulmonary circulation and systemic circulation.

(b)

(i) 1. Aster
2. Spindle fibres
3. Chromatids

(ii) Anaphase is shown in the given figure because the two chromatids of each chromosome separate and move apart towards the opposite poles.

(iii) This type of cell division occurs in the somatic cells of the body.

(iv) The stage prior to anaphase is metaphase.