

ICSE Board
Class X Biology
Sample Paper – 7 Solution

Time: 2 hrs

Total Marks: 80

SECTION-I

Answer 1

(a)

- (i) Haemoglobin
- (ii) Ureter
- (iii) Grana of the chloroplast
- (iv) Phloem
- (v) Graafian follicle

(b)

- (i) False. Cranial nerves are twelve pairs.
- (ii) False. Glucagon is produced by the alpha cells of pancreas.
- (iii) True.
- (iv) True.
- (v) True.

(c)

- (i) Diapedesis
- (ii) Active absorption
- (iii) Metaphase
- (iv) Alleles
- (v) Zygote

(d)

Set	Odd Term	Category
i. Myopia, Cataract, Hypermetropia, Cretinism	Cretinism	Defects of the eye
ii. Blinking, Knitting, Crying, Blushing	Knitting	Natural reflexes
iii. Steroids, Cortisone, Testosterone, Adrenaline	Steroids	Hormones
iv. Phloem, Root hair, Xylem, Cortex	Phloem	Parts involved in conduction of water in plants.
v. Uterus, Cervix, Fallopian tube, Ureter	Ureter	Parts of the female reproductive system.

(e)

Column I	Column II
Embryo	Uterus
Testosterone	Leydig cells
Sperm	Testes
Ovum	Ovary
Progesterone	Corpus luteum

(f)

- (i) **Crossing over:** The process of exchange of genetic material between non-sister chromatids of homologous chromosomes is called crossing over.
- (ii) **Reflex action:** Reflex action is an automatic, quick and involuntary action in the body brought about by a stimulus.
- (iii) **Centrosome:** Centrosome is a cell organelle present in an animal cell which initiates cell division.
- (iv) **Gestation:** Gestation is the time period required for the development of an embryo in the uterus.
- (v) **Photolysis:** Photolysis is the splitting of water molecules into hydrogen and hydroxyl ions in the presence of sunlight.

(g)

- (i) Endocrine glands: thyroid gland, adrenal gland
- (ii) Vaccines: *Homo habilis*, *Homo erectus*
- (iii) Phytohormones: auxin, cytokinin
- (iv) Hereditary traits: eyebrows-thin/thick, ear lobes-free/attached
- (v) Diseases caused by bacteria: cholera, diphtheria

(h)

- (i)
 1. Spinal cord
 2. Grey matter
 3. White matter
 4. Central canal
- (ii) In the brain, the cytons of the neurons are outside (white matter) and the axons are inside (grey matter). In the spinal cord, the cytons are inside (grey matter) and the axons are outside (white matter).

SECTION-II

Answer 2

(a)

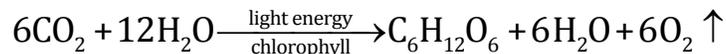
- (i) 1-Cerebrum
2-Cerebellum
3-Medulla oblongata
- (ii) Receptors are nerve cells present in the sensory organs which respond to specific stimuli and pass the impulse to the central nervous system.
- (iii) Part 2 is the cerebellum. It is responsible for maintaining the balance of the body and coordinating muscular activity. If the cerebellum is damaged, the body will become paralysed.

(b)

- (i) If there are no green plants, there will not be any food production and herbivorous animals that depend on plants, will not be able to survive. Carnivorous animals like the tiger that depend on herbivorous animals, indirectly depend on plants for their survival. In the absence of plants, they also will not be able to survive and will eventually die.
- (ii) During the mitotic telophase, at each pole, the chromosomes uncoil and form chromatin fibres. The nucleolus and the nuclear membrane reappear forming two daughter nuclei.
- (iii) When a plasmolysed cell is kept in a hypotonic solution endosmosis occurs, and water starts entering the plasmolysed cell making it deplasmolysed.
- (iv) Xerophytic plants grow in extremely hot climatic conditions where they cannot afford to lose water. The rate of transpiration depends on the surface area of the leaves. Greater the surface area, higher is the rate of transpiration. In order to reduce the loss of water through transpiration, the leaves of xerophytic plants are modified into spines.

Answer 3**(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:



- (iii) In plants, glucose is stored in the form of starch.
- (iv) The light dependent phase or the light reaction and the light independent phase or the dark reaction are the two phases of photosynthesis.
- (v) The 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) The process mentioned in the experiment is transpiration. 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 4

(a)

- (i) The hormones produced by the ovary are oestrogen and progesterone.
1. Oestrogen: It inhibits the secretion of FSH (follicular stimulating hormone) by the pituitary gland so that only one egg matures at a time. It also stimulates the pituitary to secrete LH (luteinising hormone).
 2. Progesterone: It maintains the lining of the uterus and prepares it for receiving the embryo.
- (ii) Sometimes, a zygote may split and separate into two parts. Each of these parts behaves like an independent embryo and produces a full grown individual. The individuals formed in this manner are identical twins.
- (iii) Functions of gibberellins:
1. Help in stem elongation
 2. Break dormancy of seeds and buds
 3. Delay senescence
 4. Induce parthenocarpy
- (iv) Stomata are openings present on the epidermis of a leaf. They are guarded by two bean shaped guard cells which regulate the opening and closing of the stomata, thereby helping in the exchange of gases.
- (v) Phytohormones are the chemical compounds which are produced in one area of the plant, transported around the body of the plant and have their effects at a location far away from the site of their production.

(b)

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

Answer 5

(a)

- (i) The endocrine gland shown in the figure is an adrenal gland.
- (ii) The parts of the adrenal gland are the outer cortex and the inner medulla.
- (iii) The inner part of the adrenal gland secretes the hormone adrenaline.
- (iv) Addison's disease is caused due to the hyosecretion of the outer part of the adrenal gland.
- (v) Due to the overgrowth of the adrenal cortex in some women, more cortical hormones are secreted which are responsible for the secondary sexual characters in males and females. This leads to adrenal virilism. Therefore, some women are seen with beards.

(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 6

(a)

- (i) The stage of cell division shown in the given figure is prophase.
- (ii) 1. Centrioles
2. Spindle fibres
3. Chromosomes
- (iii) During prophase, the chromosomes become short and thick and their chromatids become clearly visible. The spindle apparatus is completely formed.

(b)

- (i) Difference between menarche and menopause on the basis of definition.

Menarche	Menopause
Menarche is the onset of menstruation in young females at about 13 years of age.	Menopause is the permanent stoppage of menstruation in adult females at about 45 years of age.

- (ii) Difference between mitosis and meiosis on the basis of location.

Mitosis	Meiosis
Mitosis occurs in somatic cells.	Meiosis occurs in reproductive cells.

- (iii) Difference between the light reaction and the dark reaction on the basis of location.

Light reaction	Dark reaction
The light reaction occurs in the grana of chloroplasts.	The dark reaction occurs in the stroma of chloroplasts.

- (iv) Difference between plasmolysis and deplasmolysis on the basis of tonicity.

Plasmolysis	Deplasmolysis
Plasmolysis occurs in a hypertonic solution.	Deplasmolysis occurs in a hypotonic solution.

- (v) Difference between a monohybrid cross and a dihybrid cross on the basis of the number of characters.

Monohybrid cross	Dihybrid cross
In a monohybrid cross one pair of contrasting characters are involved.	In a dihybrid cross two pairs of contrasting characters are involved.

Answer 7

(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, 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. Plants can be destarched only when they are kept in the dark so that photosynthesis is stopped and the plants can utilize all the stored starch.
- (iii) All individuals multiply in a geometric ratio whereas space and food remain almost constant which causes a struggle for existence. There is an intense competition between the organisms for favourable shelter, climate, food supply and breeding places.
- (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) Food chain: Food chains show the feeding relationships between living organisms. They refer to the transfer of food from one organism to the other in the form of a chain. Herbivores consume plants directly, while carnivores consume herbivores.
- (ii) An experimental set-up to show that O_2 is evolved during photosynthesis:

