

**ICSE Board
Class X Biology
Sample Paper – 5 Solution**

Time: 2 hrs

Total Marks: 80

SECTION-I

Answer 1

(a)

- (i) Corpus callosum
- (ii) Synapsis
- (iii) *Biston betularia*
- (iv) Stomata
- (v) Eye orbit

(b)

- (i) Hearing
- (ii) Chloroplast
- (iii) Phagocytosis
- (iv) Cerebellum
- (v) Conduction of nerve impulse

(c)

- (i) Osmosis
- (ii) Amniotic membrane
- (iii) Demography
- (iv) Hypermetropia
- (v) Systole

(d)

- (i) Micturition
- (ii) Osmotic pressure
- (iii) Opposite to each other
- (iv) Spleen
- (v) 7.3 to 7.5

(e)

- (i) Capillary
- (ii) A Red blood cell (RBC) and a white blood cell are the two cells observed in A. A mature RBC lacks a nucleus and is biconcave in shape while a WBC is a nucleated cell without haemoglobin and is irregular in shape.
- (iii) In A, the process of diapedesis is taking place. In this process WBCs squeeze out of the blood capillaries. In B, the process of phagocytosis is taking place. In this process, WBCs engulf pathogens with the help of pseudopodia. Once the pathogens are engulfed the WBCs destroy the pathogens.

(f)

Set	Odd Term	Category
(i) Myopia, Cataract, Hypermetropia, Cretinism	Cretinism	Defects of the Eye
(ii) Blinking, Knitting, Crying, Blushing	Knitting	Simple reflexes
(iii) Steroids, Cortisone, Testosterone, Adrenaline	Testosterone	Hormones secreted by adrenal gland
(iv) Phloem, Root hair, Xylem, Cortex	Phloem	Structures involved in absorption and conduction of water.
(v) Uterus, Cervix, Fallopian tube, Ureter	Ureter	Parts of the Female reproductive system

(g)

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

(h)

- (i) Syphilis, gonorrhoea
- (ii) Ethylene, Abscisic acid
- (iii) Incus, stapes
- (iv) Diffusion, osmosis
- (v) Myopia, hypermetropia

Section II

Answer 2

(a)

- (i) Red blood cells. Found in the blood.
- (ii) Sperm and ovum. Sperms are found in the testes in males and ova are found in the ovaries in females.
- (iii) Beta cells. Found in the pancreas.
- (iv) Nerve cells/ Neurons. Neurons are found in the head and spinal cord mostly all over the body.
- (v) Lymphocytes. They are found in the spleen and in the lymph nodes.

(b)

- (i) 1. Prostate Gland; 2. Cowper's gland; 3. Urethra; 4. Epididymis; 5. Testes
- (ii) Seminiferous tubules are located in the testes in the male reproductive system.
- (iii) Sperms mature in the epididymis.

Sperm	Ovum
A sperm is the male gamete.	An ovum is the female gamete.
It is motile.	It is non-motile.
Millions of sperms mature at a time.	Only one ovum matures at a time.

Answer 3

(a)

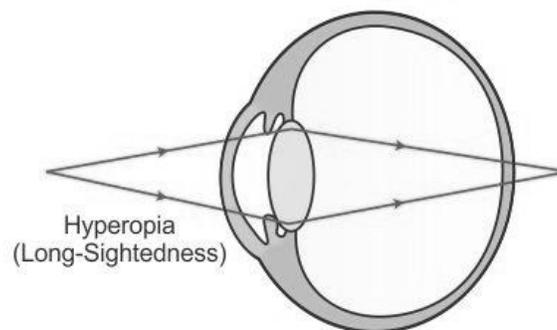
- (i) Iodine is an important factor required for the synthesis of thyroxine. Deficiency of iodine in the diet leads to hyposecretion which causes simple goitre. Therefore, iodine is important for our body.
- (ii) When we stand in front of a large crowd, anxiety results in the secretion of adrenaline. Adrenaline is responsible for preparing the body for emergency situations. Therefore, the mouth dries up and the heartbeat increases.
- (iii)

Nervous Coordination	Chemical Coordination
1. Nervous coordination is carried out electrochemically through nerve fibres.	1. Chemical coordination is carried out chemically through blood.
2. Its effects are short-lived.	2. Its effects are long-lasting.
3. It cannot regulate metabolism.	3. It regulates metabolism.
4. It can be modified by learning from pervious experiences.	4. It cannot be modified by learning from pervious experiences.

- (iv) Osmoregulation: It is the process of regulation of the percentage of water and salts in the body.

(b)

- (i) Hypermetropia:



- (ii) Neurons are nerve cells which are the functional units of the nervous system.
- (iii) Anatomical adaptations in the leaf to check transpiration are as follows:
 - 1. In some plants, the stomata are not exposed on the surface but they are sunken.
 - 2. The leaves are sometimes modified into spines.

Answer 4

(a)

- (i) Hypotonic Solution
- (ii) Turgid
- (iii) 1. Cell wall; 2. Cell membrane; 3. Chloroplasts; 4. Vacuole; 5. Nucleus
- (iv) Uses of turgidity to the plants:
 - 1. Turgidity of guard cells regulates the opening and closing of the stomata and thus helps in the exchange of gases during photosynthesis.
 - 2. Turgidity provides rigidity to the soft tissues like the leaves, young stems etc.

(b)

- (i) In a variegated leaf, the chloroplasts are present in patches.
- (ii) If the leaf is tested with the iodine test, the green part of the leaf will show blue-black colour and the non-green part will show brown colour.
- (iii) The green part of the leaf turns blue black on adding iodine indicating the presence of starch. The parts of the leaf that stain brown by iodine indicate the absence of starch. This shows that only the green parts of the plant containing chlorophyll manufacture starch during the process of photosynthesis.
- (iv) Chlorophyll is the green pigment which traps the light energy from the sun and initiates the process of photosynthesis.
- (v) The leaf is boiled in alcohol in order to dissolve the chlorophyll. The white leaf allows colour changes taking place due to the iodine test to be easily seen.

Answer 5

(a)

- (i) Homologous chromosomes are a pair of chromosomes of the same shape and size, one from each parent.
- (ii) Difference between renal artery and renal vein:

Renal artery	Renal vein
1. The renal artery contains more urea.	1. The renal vein contains less urea.
2. It carries oxygenated blood.	2. It carries deoxygenated blood.

- (iii) Riding a bicycle, solving a mathematical problem.
- (iv) Insulin promotes the consumption of glucose by the cells.
- (v) Characteristics of hormones:
 1. Hormones are produced in very small quantities and they are biologically very active.
 2. Hormones produced in one species usually show similar influence in other species.

(b)

- (i) Oxytocin is responsible for stimulating uterine contractions. So it is administered to pregnant woman at the time of labour.
- (ii) To retain the original chromosome number of the species, gametes must be produced with haploid chromosomes for sexual reproduction.
- (iii) Photosynthetic reactions are enzyme dependent reactions. All enzymes work best at their optimum temperature beyond which they degenerate. Thus at optimum temperature i.e. 35 degree Celsius, the rate of photosynthesis is higher but it is low at high temperature i.e. beyond 35 degree Celsius.
- (iv) In the morning the rate of transpiration is higher than in the evening. In the morning the seedlings may lose water and lose their viability. To avoid this, farmers sow seedlings in the evening.
- (v) In veins, blood flows against gravity. Thus to prevent the back flow of blood, veins contain valves in their inner walls.

Answer 6

(a)

- (i) 1. Frontal lobe, 2. Temporal lobe, 3. Occipital lobe, 4. Cerebellum, 5. Medulla oblongata.
- (ii) Function of Part 4 (Cerebellum) - Coordination of muscular activity and balance of the body. Function of Part 5 (Medulla oblongata) - It controls the activity of the internal organs such as the heart beat, respiration, etc.
- (iii) The outer part of the brain contains grey matter i.e. the cell bodies of the neurons and the inner part contains white matter i.e. the axons of the neurons.
- (iv) The cranium protects the brain from external injuries. Inner to the cranium lie the three layers of the meninges viz. duramater, arachnoid and piamater. The space between the meninges and the cavities of the brain contain the cerebrospinal fluid which protects the brain from mechanical injury.

(b)

- (i) Function of the aqueous humour:
 - 1. To keep the shape of the eyeball.
 - 2. To provide nourishment to the lens and the cornea.
- (ii) Function of the aorta: It carries oxygenated blood from the heart to the other parts of the body.
- (iii) Function of cytokinins:
 - 1. Stimulate cell division and cell enlargement
 - 2. Prevent ageing of plant parts
 - 3. Inhibit apical dominance
- (iv) Function of the medulla oblongata: It controls the involuntary activities such as heart beat, respiration, etc.
- (v) Function of spindle fibres: Spindle fibres hold the chromosomes in position during cell division and they also pull the chromosomes towards the poles during anaphase.

Answer 7

(a)

- (i) The trait tongue rolling is dominant.
- (ii) Out of the two parents, the female shows tongue rolling and the male is a non-tongue roller. In the F_1 progeny, a son and a daughter are tongue-rollers and another daughter is a non-tongue roller. This indicates that the female carries heterozygous genes i.e. one gene for tongue rolling and another for non-rolling. If the female was a homozygous parent then all the three offsprings would have got at least one gene for the tongue rolling making them all tongue rollers.
- (iii) Mutation: A sudden change in one or more genes or in the number of chromosomes or in the structure of the chromosomes.
- (iv) Law of Dominance: Out of a pair of contrasting characters present together, only one is able to express itself while the other remains suppressed.

(b)

- (i) Two reasons for the increase in the population of India:
 - 1. Illiteracy and lack of awareness.
 - 2. Natural increase of births over deaths.
- (ii) Wisdom teeth, vermiform appendix and pinna.
- (iii) The growth movement of plants in response to the stimulus of gravity is called geotropism. Movement of roots in the downward direction is an example of positive geotropism.
- (iv) Evolution of modern man occurred through the following ancestral forms:
 - 1. *Australopithecus*
 - 2. *Homo habilis*
 - 3. *Homo erectus*
 - 4. *Neanderthal man*
 - 5. *Cro-Magnon*
 - 6. *Homo sapiens*