

**ICSE Board**  
**Class X Biology**  
**Sample Paper – 13 Solution**

**Time: 2 hrs**

**Total Marks: 80**

**SECTION-I**

**Answer 1**

**(a)**

- (i) G<sub>1</sub>, S, G<sub>2</sub>, Karyokinesis, Cytokinesis
- (ii) Root hair, Cortex, Endodermis, Pericycle, Xylem
- (iii) Pinna, Tympanum, Ear ossicles, Cochlea, Sensory hair cells
- (iv) Receptor, Sensory neuron, Interneuron, Motor neuron, Effector
- (v) Bowman's capsule, Glomerulus, Proximal convoluted tubule, Loop of Henle, Distal convoluted tubule

**(b)**

- (i) Testosterone
- (ii) Ethylene
- (iii) Greenhouse effect
- (iv) Guard cells
- (v) Micturition

**(c)**

- (i) The type of lens used to correct hypermetropia is convex.
- (ii) The basic unit of the human kidney is the nephron.
- (iii) The end-product of fermentation is ethyl alcohol/lactic acid.
- (iv) A non-degradable pollutant is DDT.
- (v) The period of complete development of the foetus till birth is termed zygote.

**(d)**

- (i) C. Nucleosomes. A nucleosome is the basic unit of DNA packaging in eukaryotes consisting of a segment of DNA wound in sequence around eight histone protein cores.
- (ii) A. Humidity. Humidity does not affect the process of photosynthesis.
- (iii) B. Vasectomy. In vasectomy, the male vas deferens are cut and tied or sealed.
- (iv) A. Wisdom teeth. In man, wisdom teeth, vermiform appendix and pinna are vestigial.
- (v) B. Pulmonary. All veins carry impure or deoxygenated blood except the pulmonary vein which carries pure or oxygenated blood.

(e)

- (i) **Survival of the fittest:** During the struggle for existence, only individuals with advantageous adaptations or variations survive, while those without these variations are eliminated. This is called survival of the fittest.
- (ii) **Mitosis:** Mitosis is a type of cell division during which a cell divides into two daughter cells, each containing the same number of chromosomes as the parent cell.
- (iii) **Bleeding:** Exudation of sap or watery solution from a cut or injured parts of a plant is called bleeding.
- (iv) **Cushing's syndrome:** It is a condition caused by hypersecretion of the adrenal cortex resulting in excessive production of glucocorticoids.
- (v) **Apical dominance:** The phenomenon of suppression of growth of the lateral buds by the apical buds is called apical dominance.

(f)

Column I	Column II
1. Pacemaker	d) SA node
2. Stroma	g) Site of dark reaction
3. Afferent nerve	f) Transmits impulses from receptor organ to spinal cord
4. Prolactin	e) Stimulates production of milk by the mammary glands
5. Saccules	a) Associated with static body balance

(g)

- (i) Grana and light reaction.
- (ii) Uterus and implantation.
- (iii) Autonomic nervous system and involuntary actions.
- (iv) Lymphocytes and antibodies.
- (v) Antitoxins and serum and passive immunisation.

(h)

- (i) False. Tubectomy in woman is a method of preventing pregnancy.
- (ii) False. Deforestation and automobile exhaust are two main sources of air pollution.
- (iii) True.
- (iv) True.
- (v) False. Osmoregulation is related to the habitat of the organism.

**SECTION-II**

**Answer 2**

**(a)**

- (i) Excretion is the process of removal of nitrogenous waste products from the body.
- (ii) Nephron.
- (iii) The cortex of the kidney shows a dotted appearance due to the presence of malpighian corpuscles.
- (iv) Functions of the kidney:
  - Urine formation
  - Osmoregulation
- (v) Differences in the composition of the blood flowing through blood vessels A (renal vein) and B (renal artery):

<b>Renal vein</b>	<b>Renal artery</b>
• Carries deoxygenated blood	• Carries oxygenated blood
• Contains less water and urea	• Contains more water and urea

**(b)**

- (i) Iodine stimulates the secretion of thyroxine hormone. Deficiency of iodine in the diet causes simple goitre.
- (ii) Adrenaline.
- (iii) Nervous coordination affects a particular muscle or gland, while chemical coordination affects any organ.
- (iv) Hormones are secretions of the endocrine glands which are carried by blood to all the parts of the body but act on target organs.
- (v) Adrenocorticotrophic hormone (ACTH).

**Answer 3**

**(a)**

- (i)
  1. Aorta
  2. Left auricle
  3. Left ventricle
  4. Dorsal aorta
  5. Inferior vena cava
  6. Superior vena cava
  7. Pulmonary artery
- (ii) If the coronary artery gets an internal clot, it will result in a heart attack.
- (iii) Difference between 5 (inferior vena cava) and 4 (dorsal aorta):

<b>Inferior vena cava</b>	<b>Dorsal aorta</b>
<ul style="list-style-type: none"> <li>• Thin and less muscular walls</li> </ul>	<ul style="list-style-type: none"> <li>• Thick muscular walls</li> </ul>

**(b)**

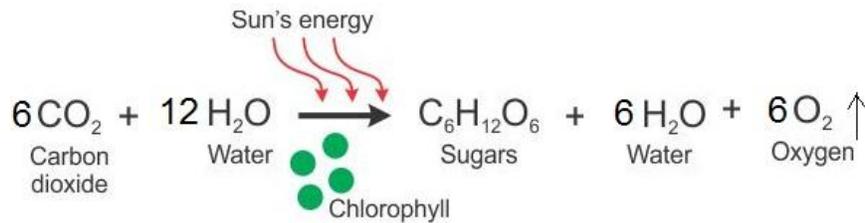
- (i) Testes
- (ii) Chromosomes
- (iii) Brain
- (iv) Chloroplast
- (v) Inner ear

**Answer 4**

**(a)**

(i) The process by which green plants manufacture their own food from CO<sub>2</sub> and water in the presence of sunlight is called photosynthesis.

(ii) Balanced equation for photosynthesis:



(iii) Starch

(iv) Phases of photosynthesis:

- Light reaction
- Dark reaction

(v) Palisade parenchyma contains a large number of chloroplasts. As a result, the extent of photosynthesis is more in palisade parenchyma.

**(b)**

(i) The pressure developed in the cortical cells of the root which pushes the water into the xylem vessels of the stem is called root pressure.

(ii) Differences between mitosis and meiosis:

Mitosis	Meiosis
• Equational division	• Reductional division
• Two daughter cells formed	• Four daughter cells formed

(iii) Function of auxins: Promote cell elongation

(iv) Adrenaline increases the heartbeat and blood supply to the muscles, decreases the blood supply to the digestive system, resulting in dry mouth.

(v) Neanderthal man

**Answer 5**

**(a)**

- (i) 1: White matter  
2: Grey matter  
3: Dorsal root  
4: Ventral root  
5: Dorsal root ganglion  
6: Sensory ganglion  
7: Spinal nerve  
8: Synapse
- (ii) Arrows indicate the direction of the impulse. The pathway indicated is termed the nervous reflex arc pathway.
- (iii) Spinal nerve

**(b)**

- (i) Rise in population in recent years: In recent years, advancement in technology and medical facilities has increased. This has increased the birth rate and decreased the death rate which has resulted in a rise in the population.
- (ii) Significance of imbibition in plants: Imbibition helps in germination of seeds and absorption of water by roots in the initial stages. Imbibition pressure helps in the ascent of sap.
- (iii) Hydrotropism: Movement of plant parts in response to water or moisture is called hydrotropism. Movement of plant part towards water is called positive hydrotropism, while movement away from the source of water is called negative hydrotropism.
- (iv) Speciation: As the environment changes, advantageous variations are selected by nature which result in a new species altogether. The origin of new species by gradual modification is called speciation.
- (v) Immunity: Immunity is the resistance of our body against microorganisms or pathogens. Immunity is of two types—natural immunity and acquired immunity.

**Answer 6**

**(a)**

- (i) Beetroot cells contain soluble sugar, whereas potato cells contain insoluble starch. As a result, osmotic processes readily occur in beetroot cells than in potato cells.
- (ii) Cell membrane.
- (iii) Sucrose.
- (iv) Plasmolysis occurs due to the presence of sucrose solution. The cell membrane withdraws itself from the cell wall and the cell gets plasmolysed.

**(b)**

- (i)
  - (a) Mortality: Mortality is the number of deaths per 1000 people of population per year.
  - (b) Natality: Natality is the number of live births per 1000 people of population per year.
- (ii) Importance of turgidity for plants:
  - Provides shape and rigidity to soft tissues.
  - Turgor in root cells builds up root pressure.
- (iii) Characteristics of Cro-Magnon man:
  - Cranial capacity is about 1450–1600 cm<sup>3</sup>.
  - Large skull, broad face, rounded forehead and prominent chin.
- (iv) Functions of ethylene:
  - Induces fruit ripening
  - Promotes senescence

**Answer 7**

**(a)**

(i) Advantages of transpiration for plants:

- Cools plants when the outside environment is hot.
- Creates transpiration pull to draw the sap upwards.

(ii) Functions of WHO:

- To collect and supply information about the occurrence of diseases of epidemic nature.
- To promote and support projects for research on diseases.

(iii) Rods and cones

(iv) Need to control population:

- To ensure self-sufficiency in food
- To avail better education
- To minimise the pressure on fuels
- To avail better health services

(v) Principle of vaccination:

Germ or germ-causing substances of a certain disease is introduced into the body which stimulates antibody production in the body. These antibodies destroy germs in any subsequent infection of that very disease.

**(b)**

- (i) 1 → Pulmonary vein  
 2 → Dorsal aorta  
 3 → Hepatic portal vein  
 4 → Renal artery  
 5 → Renal vein  
 6 → Hepatic vein  
 7 → Inferior vena cava  
 8 → Pulmonary artery

(ii)

1. Left auricle
2. Right ventricle

(iii) Structural differences between blood vessels '7' (vein) and '2' (artery):

Vein	Artery
<ul style="list-style-type: none"> <li>• Thinner muscular walls</li> </ul>	<ul style="list-style-type: none"> <li>• Thick muscular walls</li> </ul>
<ul style="list-style-type: none"> <li>• Wider lumen with valves</li> </ul>	<ul style="list-style-type: none"> <li>• Narrow lumen without valves</li> </ul>