

**ICSE Board  
Class X Biology  
Sample Paper – 6 Solution**

**Time: 2 hrs**

**Total Marks: 80**

**SECTION-I**

**Answer 1**

**(a)**

<b>Odd One</b>	<b>Category</b>
(i) Cerebellum	Parts of the forebrain
(ii) Ureter	Parts of the human female reproductive system
(iii) Liver	Endocrine glands
(iv) Pinna	Ear ossicles
(v) Night blindness	Sex-linked inheritance

**(b)**

(i) True.

(ii) False.

Correct Statement: Respiration occurs in all the cells of the plant.

(iii) False.

Correct Statement: The pancreas is both exocrine and endocrine in function.

(iv) True.

(v) False.

Correct Statement: All voluntary actions are controlled by the cerebrum.

**(c)**

(i) Chloroplast: The chloroplasts are located inside the plant cells and are mainly contained in the mesophyll cells located between the upper and the lower epidermis of the leaves.

(ii) Incus: The incus is present between the malleus and the stapes bones in the middle ear.

(iii) Corpus Callosum: The corpus callosum is located between the two cerebral hemispheres.

(iv) Guard Cells: Guard cells are present on the lower epidermis of a dorsiventral leaf surrounding/ on either side of the stoma.

(v) Pulmonary semilunar valve: The pulmonary semi lunar valve is located at the opening of the right ventricle into the pulmonary artery.

**(d)**

- (i) Intrauterine device
- (ii) Abscisic acid
- (iii) Gibberellic acid
- (iv) National malaria eradication programme
- (v) Biological oxygen demand.

**(e)**

- (i) Menopause: Menopause is the permanent stoppage of the menstrual cycle which usually occurs in human females above the age of 45 years. in.
- (ii) Transpiration: Transpiration is the loss of water in the form of water vapour from the aerial parts of the plant's body.
- (iii) Tonicity: Tonicity is the relative concentration of solutes in a solution.
- (iv) Plasmolysis: When a cell is kept in a hypertonic solution, water is drawn out of the cell by exosmosis causing the shrinkage of its cytoplasm. This is called plasmolysis.
- (v) Cytokinesis: Cytokinesis is the division of the cytoplasm during cell division.

**(f)**

- (i) Ganong's Potometer.
- (ii) A potometer does not measure the water loss by transpiration but it measures the water uptake by the plant. Water absorbed by the plant is not completely lost by transpiration; some of the water is used for the cells activities.
- (iii) Transpiration.
- (iv) The part reservoir is used to bring the air bubble to its original position. This is done by releasing some water from the reservoir into the capillary tube.
- (v) The movement of the air bubble in the graduated tube gives the volume of water lost in a given time which is equal to the rate of transpiration of the leafy shoot.

**(g)**

- (i) Hypothalamus and controls body temperature.
- (ii) Suspensory ligaments and holds eye lens in position.
- (iii) Semi circular canals and dynamic equilibrium.
- (iv) Mitochondria and cellular respiration.
- (v) Seminiferous tubules and production of sperms.

**(h)**

- (i) (B) Moth
- (ii) (A) Retina
- (iii) (A) Remove starch from the plant
- (iv) (B) Nicotinamide adenine dinucleotide phosphate
- (v) (A) Receptor cell, sensory neuron, relaying- neuron, effector muscles.

**Section II**

**Answer 2**

**(a)**

(i) Umbilical cord

(ii) It is the placenta.

Functions of the placenta are:

1. Nutrients diffuse from the mother's blood into the foetus' blood.

2. Oxygen is supplied to the foetus and the carbon dioxide diffuses into the mother's blood from the foetus' blood.

(iii) The amniotic fluid forms a cushion around the embryo and protects it from jerks and shocks. It also protects the embryo from getting dried up.

(iv) 280 days.

**(b)**

<b>(i) Natality</b>	<b>Mortality</b>
Natality is the number of children born per 1000 living persons per year.	Mortality is the number of deaths per 1000 living persons per year.
<b>(ii) Stoma</b>	<b>Stroma</b>
Stoma is a pore present in the epidermal layers of the leaves. It is guarded by two bean shaped guard cells on either side.	Stroma is the colourless ground substance present in the chloroplasts.
<b>(iii) Acromegaly</b>	<b>Cretinism</b>
Acromegaly is caused due to the over secretion of the growth hormone. It causes extra growth of the bones in the face and in the hands and feet.	Cretinism is caused due to a deficiency of thyroxine. It affects the growth of children showing dwarfism and mental retardation.
<b>(iv) Transpiration</b>	<b>Guttation</b>
Transpiration is the loss of water in the form of water vapour that occurs through the stomata, cuticle and lenticels. The stomata are mainly responsible for this water loss. The stomatal pore is guarded by two bean shaped guard cells.	The process by which water escapes from hydathodes present on the leaf margins is called guttation.
<b>(v) Diabetes mellitus</b>	<b>Diabetes insipidus</b>
Diabetes mellitus is caused due to the insufficient secretion of insulin.	Diabetes insipidus is caused due to the deficiency of anti-diuretic hormone.

**Answer 3**

**(a)**

- (i) The defect is hypermetropia (far-sightedness) because in the diagram, the image is formed behind the retina.
- (ii) Reasons for hypermetropia are:-
  1. Shortening of the eye ball from front to back.
  2. The lens becomes too flat.
- (iii) Hypermetropia can be rectified by using convex lenses of appropriate power (focal length).
- (iv) Vitreous chamber

**(b)**

- (i) In hilly regions, the soil is iodine deficient, thus the food grown in such soil is also iodine deficient. Iodine is necessary for the synthesis of the thyroid hormone. Simple goitre is caused due to hyosecretion of thyroxine. Therefore, people living in hilly regions usually suffer from simple goitre.
- (ii) During summer, excess water is lost from the body by perspiration. As a result there is more reabsorption of water from the kidney tubules into the blood. The urine is therefore more concentrated and thicker. In winters, the perspiration is highly reduced; thus smaller amounts of water are reabsorbed by the kidney tubules making the urine more dilute. Therefore, the urine is slightly thicker in summer than in winter.
- (iii) Potato cubes absorb water by the process of endosmosis and the cell membrane acts as a semi-permeable membrane. Due to endosmosis, the potato increases in size. At this time due to turgor pressure and wall pressure, the potato becomes firm.
- (iv) The absence of a nucleus in a mature mammalian erythrocyte increases the surface area volume ratio. More erythrocytes can be accommodated in the same space. At the same time, the oxygen carrying capacity of the erythrocytes increases. A lack of mitochondria ensures that all the oxygen absorbed by RBCs is transported and delivered fully to the tissues. Therefore, a matured mammalian erythrocyte lacks a nucleus and mitochondria.
- (v) Plants prepare their food by the process of photosynthesis. Herbivores are dependent on plants for their food. Carnivores depend on herbivores. All animals directly or indirectly are dependent on plants to obtain food for energy. Therefore, photosynthesis is considered as a process supporting all life on earth.

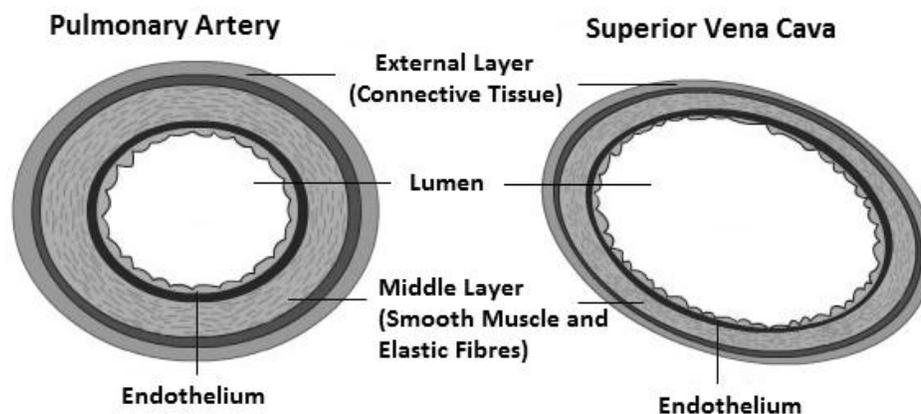
**Answer 4**

**(a)**

- (i) *Pisum sativum*.
- (ii) The genotype of the F<sub>1</sub> generation is RrYy i.e. heterozygous pea plant with yellow and round seeds.
- (iii) The dihybrid phenotypic ratio is 9: 3: 3: 1 in the F<sub>2</sub> generation.  
Yellow and round seeds  
Round and green seeds  
Yellow and wrinkled seeds  
Green and wrinkled seeds
- (iv) **Law of Independent Assortment**- When there are two pairs of contrasting characters, the distribution of the members of one pair into the gametes is independent of the distribution of the other pair.
- (v) Gametes obtained from F<sub>1</sub> → YR, yR, Yr, yr.

**(b)**

- (i) Atrial systole.
- (ii) 1. Pulmonary artery  
2. Superior vena cava.  
3. Aorta.
- (iii) The atria are contracting in this phase. In the diagram, the arrows indicating the flow of blood are shown from the atria to the ventricles. During an atrial systole, the atria contract and the blood moves from the atria to the respective ventricles.
- (iv) Diagram of Artery and Vein:



### Question 5

**(a)**

- (i) *Homo erectus*
- (ii) Pollutant
- (iii) Menarche
- (iv) Umbilical cord
- (v) Cerebrospinal fluid
- (vi) Lenticels
- (vii) Photosynthesis
- (viii) Response
- (ix) Lysozymes
- (x) Isotonic Solution

**(b)**

- (i) Organs which are found in reduced or rudimentary condition and do not perform any function in the possessor are called vestigial organs or non-functional organs. They help in understanding the history of evolution and continuity of life.  
Examples: Wisdom teeth, vermiform appendix, pinna.
- (ii) Evolution is a slow and continuous process whereby complex forms of life have emerged from simpler forms through millions of years.
- (iii) Functions of auxins: (Any two)
  1. Promote cell elongation
  2. Suppress the growth of lateral buds
  3. Delay fall of leaves
  4. Induce formation of parthenocarpic fruits

**Answer 6**

**(a)**

- (i) Guanine, thymine, adenine, cytosine.
- (ii) Deoxyribonucleic acid.
- (iii) Gene
- (iv) Difference between mitosis and meiosis:

<b>Mitosis</b>	<b>Meiosis</b>
1. Two daughter cells are produced.	Four daughter cells are produced.
2. Diploid cells are produced.	Haploid cells are produced.

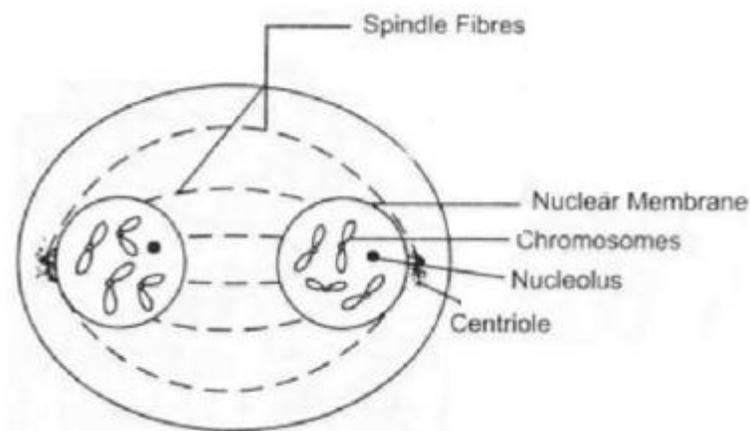
**(b)**

- (i)
  - 1. Posterior vena cava
  - 2. Aorta
  - 3. Renal artery
  - 4. Renal vein.
- (ii)
  - 5. Ureters: Transport urine from the kidneys to the urinary bladder.
  - 6. Urinary bladder: It stores the urine temporarily.
  - 7. Sphincter: It guards the opening of the urinary bladder into the urethra and relaxes only at the time of urination (micturition).
  - 8. Urethra helps to release the urine from the urinary bladder out of the body.
- (iii) Adrenal gland. They are placed on top of both the kidneys like a cap.

**Answer 7**

**(a)**

- (i) Anaphase of mitosis because the chromatids are moving towards the opposite poles.
- (ii) 1. Centriole  
2. Spindle fibres  
3. Chromatid
- (iii) Four
- (iv) Telophase: The stage that comes after anaphase



**(b)**

- (i) Part 3: Liver and Part 4: Gut
- (ii) Blood goes from the gut to the liver because the liver monitors the flow of nutrients in the blood circulation. All extra nutrients are stored and toxic substances are detoxified in the liver.
- (iii) The hepatic portal vein carries blood from the gut to the liver.
- (iv) This type of system is known as the hepatic portal system.