

**ICSE Board**  
**Class X Biology**  
**Sample Paper – 10 Solution**

**Time: 2 hrs**

**Total Marks: 80**

**SECTION-I**

**Answer 1**

**(a)**

- (i) Amnion
- (ii) Afferent arteriole
- (iii) RBCs (Red Blood Cells)
- (iv) Chloroplast
- (v) Cohesive force/Transpiration pull

**(b)**

- (i) False. Myopia is a defect of the eyeball being elongated.
- (ii) True.
- (iii) True.
- (iv) True.
- (v) True.

**(c)**

- (i) Angina pectoris
- (ii) Osmotic pressure
- (iii) Cytokinesis
- (iv) Auxin
- (v) Gestation

**(d)**

SET	ODD TERM	CATEGORY
i. Pinna, Tympanum, Ear ossicles, Lacrimal gland	Lacrimal gland	Parts of the ear
ii. Cerebrum, Thalamus, Hypothalamus, Pons	Pons	Parts of the forebrain
iii. Plasmolysis, Diffusion, Imbibition, Osmosis	Plasmolysis	Methods of absorption and conduction of water
iv. Fallopian tube, Vas deferens, Uterus, Vagina	Vas deferens	Parts of the female reproductive system
v. Lymphocytes, Neutrophils, Acidophils, Basophils	Lymphocytes	Granular white blood cells

(e)

- (i) The chemical factors responsible for plant growth are called phytohormones/plant hormones.
- (ii) Oxygen released during photosynthesis comes from water.
- (iii) ATP stands for Adenosine triphosphate.
- (iv) A highly muscular chamber of the heart is the left ventricle.
- (v) The duct which leads from the epididymis to the urethra is the vas deferens/sperm duct.

(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 a spontaneous, quick and involuntary action in the body due to a stimulus.
- (iii) **Evolution:** Evolution is a slow and continuous process whereby complex forms of life have emerged from simpler forms through millions of years.
- (iv) **Gestation:** Gestation is the period of development of an embryo in the uterus.
- (v) **Photolysis:** Photolysis is the process of splitting of water molecules into hydrogen and hydroxyl ions in the presence of light energy.

(g)

Column I	Column II (Answers)
i. Gregor Mendel	(c) Garden pea
ii. Centromere	(d) Chromatids
iii. Myxoedema	(a) Undersecretion of thyroxine
iv. Dark reaction	(e) Stroma
v. Phenotype	(b) Long hair

(h)

- (i) Cerebellum
- (ii) Eustachian tube
- (iii) Hydathodes
- (iv) Vas deferens
- (v) Leptotene

**SECTION-II**

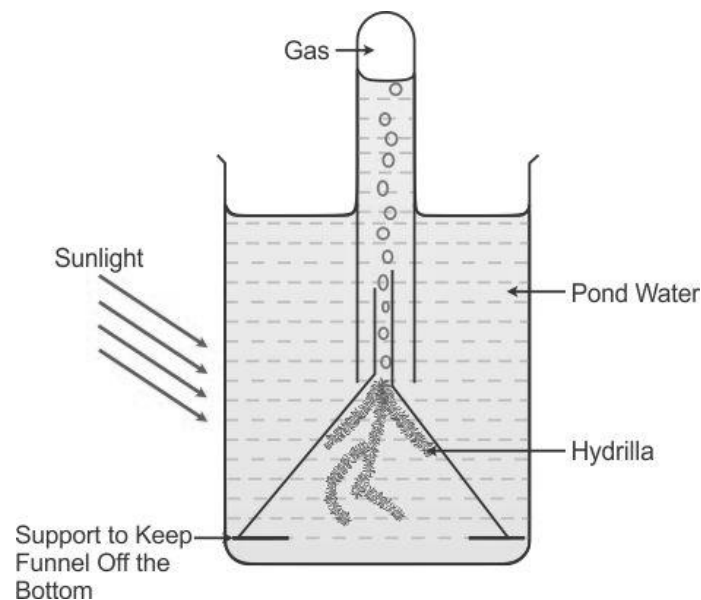
**Answer 2**

**(a)**

- (i) Root pressure is the pressure that develops in the cortical cells of the root which pushes the cell sap upwards in the xylem.
- (ii) Synapsis is the pairing of homologous chromosomes during meiosis.
- (iii) Significance of turgidity:  
It develops root pressure which helps in the ascent of sap in the xylem vessels.
- (iv) Adrenaline prepares the body for fight and flight mechanism. It increases the heartbeat, blood pressure and breathing becomes faster.
- (v) Vestigial organs are those organs that have ceased to be of any use to the possessor but still persist generation after generation in a reduced form.

**(b)**

- (i) Experimental set-up to show that  $O_2$  is evolved during photosynthesis:



- (ii) Biosynthetic phase is a light independent phase of photosynthesis during which hydrogen of NADPH is used to combine with carbon dioxide to produce ATP.

**Answer 3**

**(a)**

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

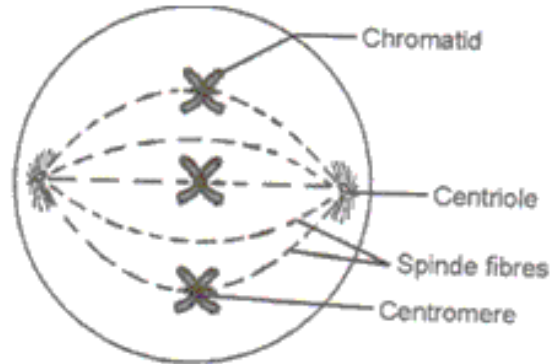
**(b)**

- (i) After industrial revolution, the pollution in the area caused the death of lichens and darkening of the tree trunks with soot. As a result, the dark variety was better hidden and was not easily picked by birds as compared to the light variety.
- (ii) In hilly areas, there is a deficiency of iodine rich compounds in the soil. Hence, the food grown in such type of soil also becomes iodine deficient. Therefore, goitre is common in people living in hilly areas.
- (iii) Xerophytic plants are found in extremely hot climatic conditions. In order to conserve water and reduce the rate of transpiration, the leaves of xerophytic plants are modified into spines.
- (iv) Blood is pumped out of the heart into the arteries with great force and pressure. To withstand this high pressure, the arteries are deep seated in the body..
- (v) When a person is in a cinema hall, his pupils are dilated and there is regeneration of rhodopsin. When the person suddenly comes outdoors into the bright light, his pupils remain dilated for some time and due to the presence of rhodopsin, he is unable to see properly for some time.

**Answer 4**

**(a)**

(i) Metaphase of mitosis:



(ii) Difference between mitosis and meiosis:

<b>Mitosis</b>	<b>Meiosis</b>
1. Mitosis occurs in somatic cells.	1. Meiosis occurs in reproductive cells.
2. The daughter cells contain the same number of chromosomes as compared to the parent cell.	2. The daughter cells contain half the number of chromosomes as compared to the parent cell.
3. Two daughter cells are formed.	3. Four daughter cells are formed.
4. Mitosis helps in the growth and replacement of injured cells.	4. Meiosis helps in the formation of gamete cells.

(b)

(i) Difference between a chromosome and a centrosome on the basis of the location.

<b>Chromosome</b>	<b>Centrosome</b>
A chromosome is a thread-like structure present in the nucleus of a cell.	A centrosome is a cell organelle present in the cytoplasm of a cell.

(ii) Difference between turgidity and flaccidity on the basis of the state of the cell.

<b>Turgidity</b>	<b>Flaccidity</b>
The cell is fully distended and turgid.	The cell content shrinks and the cell is in a plasmolysed state.

(iii) Difference between transpiration and guttation on the basis of the structure responsible.

<b>Transpiration</b>	<b>Guttation</b>
Transpiration occurs through stomata.	Guttation occurs through hydathodes.

(iv) Difference between birth rate and death rate on the basis of the definition.

<b>Birth rate</b>	<b>Death rate</b>
Birth rate is the number of live births per 1000 of the population per year.	Death rate is the number of deaths per 1000 of the population per year.

(v) Difference between auditory nerve and optic nerve on the basis of their function.

<b>Auditory nerve</b>	<b>Optic nerve</b>
The auditory nerve transmits impulses from the ear to the brain.	The optic nerve transmits impulses from the eye to the brain.

**Answer 5**

**(a)**

- (i) Due to remarkable discoveries in the field of medical science and an increase in food production, people have started living a comfortable life and their life span has increased considerably. There is a sharp decrease in the number of deaths in all age groups. The birth rate is exceeding the death rate which has led to a rise in population in the recent years.
- (ii) The permanent stoppage of the menstrual cycle in females is called menopause. It usually occurs around the age of 45 years.
- (iii) Variations are differences between individuals of a species. Variations cause changes which leads to evolution.
- (iv) Development of fruits without fertilisation is called parthenocarpy.
- (v) Functions of the nervous system:
  - 1. It controls all the voluntary and involuntary activities of the body.
  - 2. It keeps us informed about the surroundings through the sense organs.

**(b)**

- (i) The phenomenon represented in the set-up is transpiration.
- (ii) Pot 'B' acts as a 'control' for the experiment. It helps us to compare the result that we obtain from the experiment.
- (iii) The presence of a thick cuticle on the leaf surface prevents excessive transpiration in plants. Xerophytic plants grow in hot climatic conditions and it is very important for these plants to conserve water. Therefore, xerophytic plants show the presence of a thick cuticle.
- (iv) Bleeding is the exudation of plant sap due to high root pressure through the injured parts or cut surfaces of a plant.

**Answer 6**

**(a)**

- (i) **Endosmosis:** The movement of water into a cell, when it is placed in a hypotonic solution is called endosmosis.
- (ii) **Placenta:** Placenta is a disc-like structure attached to the uterine wall. It provides nourishment and oxygen to the developing foetus.
- (iii) **Ovulation:** The process of rupturing the Graafian follicle to release the mature ovum is called ovulation.
- (iv) **Corpus luteum:** Corpus luteum is a yellow mass formed after the release of the mature ovum from the Graafian follicle. It secretes female sex hormones, oestrogen and progesterone.
- (v) **Ultrafiltration:** Filtration of the liquid part of the blood due to a pressure created in the glomerulus because of the difference in the diameter of the afferent arteriole and the efferent arteriole is called ultrafiltration.

**(b)**

- (i) The diagram represents the cross-section (transverse section) of the spinal cord.
- (ii)
  - 1. Grey matter
  - 2. Cell body
  - 3. Central canal
  - 4. White matter
- (iii) Part 3, i.e., the central canal is filled with the cerebrospinal fluid.
- (iv) Functions of spinal cord:
  - 1. It conducts sensory impulses from the skin and the muscles to the brain.
  - 2. It conducts motor responses from the brain to the muscles of the trunk and the limbs.



**Answer 7**

**(a)**

- (i) Homologous chromosomes: Homologous chromosomes are a pair of chromosomes of the same shape and size, each of which is obtained from either of the parents.
- (ii) Difference between renal artery and renal vein:

<b>Renal artery</b>	<b>Renal vein</b>
1. The renal artery contains more urea.	1. The renal vein contains less urea.
2. The renal artery carries oxygenated blood.	2. The renal vein carries deoxygenated blood.

- (iii) Examples of conditioned reflexes:
  1. Knitting while watching television.
  2. Covering the mouth while sneezing.
  3. Driving a car.
- (iv) Role of insulin:
  1. Insulin activates the cells to consume more glucose.
  2. It stimulates the conversion of glucose to glycogen.
- (v) Characteristics of hormones:
  1. Hormones are not stored inside the body and are excreted out of the system.
  2. Hormones produced in one species usually show similar influence in the other species.

**(b)**

- (i) Oxytocin is responsible for stimulating uterine contractions. This is why, it is administered to pregnant woman at the time of labour.
- (ii) To retain the original chromosome number of the species during sexual reproduction, the gametes must be produced with a haploid number of chromosomes.
- (iii) Photosynthetic reactions are enzyme dependent reactions. All enzymes work best at their optimum temperature, beyond which they degenerate. Therefore, at optimum temperature, i.e., 35°C, the rate of photosynthesis is higher. However, the rate of photosynthesis slows down as the temperature goes on increasing.
- (iv) In the morning, the rate of transpiration is higher as compared to that in the evening. In the morning, the seedlings may lose water and even their viability. To avoid this, the farmers sow seedlings in the evening.
- (v) Blood flows against gravity in the veins. To prevent the backflow of blood, the veins contain valves in their inner walls.