# ICSE Board
# Class X Biology
# Sample Paper – 2 Solution

**Time: 2 hrs** **Total Marks: 80**

## SECTION I

**Answer 1**

**(a)**

(i) Afferent arteriole
(ii) Hypertension
(iii) Spinal cord
(iv) Calcitonin
(v) Charles Darwin

**(b)**

(i) False. Rods are photoreceptor cells which are sensitive to dim light.
(ii) True.
(iii) False. Vasectomy is the surgical method of sterilisation in males.
(iv) True.
(v) False. A neuron is the basic unit of the brain.

**(c)**

(i) Sino Atrial (SA) node
(ii) Catabolism
(iii) Nucleosome
(iv) Imbibition
(v) Diabetes insipidus

**(d)**

(i) Tympanum, malleus, incus, stapes, oval window
(ii) Graafian follicle, ovum, funnel of oviduct, fallopian tube, uterus
(iii) Soil water, root hair, cortex, endodermis, xylem
(iv) Receptor, sensory neuron, association neuron, motor neuron, effector
(v) Conjunctiva, cornea, pupil, lens, yellow spot

**(e)**

(i) Aqueous chamber
(ii) Acromegaly
(iii) Diaphragm
(iv) Anaphase
(v) Endolymph

**(f)**

(i) Phototropism
(ii) Geotropism
(iii) Thigmotropism
(iv) Chemotropism
(v) Hydrotropism

**(g)**

(i)

| Rods | Cones |
|---|---|
| Rods are sensitive to dim light and contain the pigment rhodopsin. | Cones are sensitive to bright light, responsible for colour vision and contain the pigment iodopsin. |

(ii)

| Enzymes | Hormones |
|---|---|
| Enzymes are proteins secreted or produced at the site of metabolic reaction. | Hormones chemically can be proteins, steroids or amino acids. They are produced by endocrine glands and are transported to the target site by the blood. |

(iii)

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

(iv)

| Mitosis | Meiosis |
|---|---|
| Mitosis helps in replacing the damaged cells and causes body growth. | Meiosis helps in reproduction and brings about variation in the offspring. |

(v)

| Light Reaction | Dark Reaction |
|---|---|
| Light reaction takes place in the grana of the chloroplasts and is dependent on light energy. | Dark reaction takes place in the stroma of the chloroplasts and is independent of light energy. |

**(h)**

(i) A - Erythrocytes; B - Leucocytes; C - Thrombocytes

(ii) Erythrocytes: Supply oxygen to the cells of the body.
Leucocytes: Play an important role in the immunity of the body by producing antibodies or by performing phagocytosis.
Thrombocytes: Help in the coagulation of blood.

(iii) 1. Leucocytes have pseudopodia to catch and engulf microorganisms.
2. Leucocytes show amoeboid movement so that they can squeeze out of the capillaries and reach the site of infection in a short period of time.

## Section II

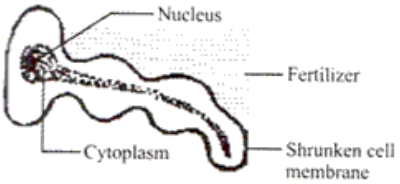
**Answer 2**

**(a)**

(i) 1. Root hair; 2. Soil particles; 3. Xylem; 4. Cortex; 5. Nucleus

(ii) The root hair cell is unicellular.

(iii) Diagram of root hair after adding fertiliser.




(iv) Root pressure and osmotic pressure are responsible for the movement of water.

(v) The pressure is set up by the alternate turgidity and flaccidity of cells which help to move the cell sap upwards due to osmotic pressure. This creates the root pressure which ultimately helps to absorb water.

**(b)**

(i) Stoma

(ii) 1. Chloroplast; 2. Inner wall of guard cell; 3. Nucleus; 4. Outer wall of guard cell; 5. Stomatal opening

(iii) In A, guard cells are turgid and the stoma is open, while in B, guard cells are flaccid and the stoma is closed.

(iv) The guard cells have thick inner walls and thin outer walls. Guard cells contain chloroplasts. During the day because of photosynthesis, synthesis of glucose in the guard cells leads to an increase in osmotic pressure. The surrounding epidermal cells have a lower osmotic pressure and water from them diffuses into the guard cells making them turgid and causing them to bulge outwards.. This results in opening of the stoma. During the night, photosynthesis stops, thus the amount of glucose inside the guard cells decreases due to which guard cells give out water and become flaccid. This results in closing of the stoma.

**Answer 3**

**(a)**

(i) 1. Pinna; 2. Eardrum; 3. Auditory canal; 4. Ear ossicles; 5. Semi-circular canals; 6. Cochlea; 7. Auditory nerve; 8. Eustachian tube

(ii) Part 6, i.e. cochlea, possesses the organ of Corti which helps in transmission of hearing impulses to the auditory nerve. Part 7, i.e. auditory nerve, carries impulses for hearing and balancing from the inner ear to the brain.

(iii) The sharp object may damage the ear drum which is the main structure of the ear. It vibrates to produce sound when sound waves strike it and transmits these vibrations to the ear ossicles and the inner ear. Therefore, it is harmful to use a sharp object to remove wax from the ear.

**(b)**

(i) 1. Umbilical cord; 2. Placenta; 3. Amniotic fluid; 4. Amnion

(ii) Part 2, i.e. placenta, protects the foetus and provides nourishment and oxygen, and removes urea through the umbilical cord. Part 3, i.e. amniotic fluid, acts as a shock absorber. It protects the foetus from mechanical jerks.

(iii) The blood of the foetus is in close contact with the mother's blood. Oxygen and nutrients diffuse from the mother's blood to the foetus' blood and the $CO_2$ diffuses from the foetus' blood to the mother's blood.

**Answer 4**

**(a)**

(i) 1. Larynx; 2. Left lobe of thyroid gland; 3. Trachea; 4. Oesophagus

(ii) Part 2, i.e. the thyroid gland, secretes thyroxine and calcitonin.

(iii) Enzymes are affected by hormones.

(iv) Hormones may be proteins, amino acids or steroids.

(v) Iodine is required for the synthesis of thyroxine. Hence, for the secretion of thyroxine in normal amounts, a proper intake of iodine is necessary.

**(b)**

(i) Reasons for the increase in population in India:

1. Improved food production and the availability of quality food.
2. Most of the rural population of India is illiterate and hence is not aware about the advantages of the small family.

(ii) NADP - Nicotinamide Adenine Dinucleotide Phosphate
BCG - Bacillus Calmette Guerin

(iii) <u>Changes in the evolution from an ape-like form to human form:</u>

1. Bipedal locomotion
2. Increase in cranial capacity

(iv) <u>Principles forming the basis of Darwin's theory of natural selection:</u>

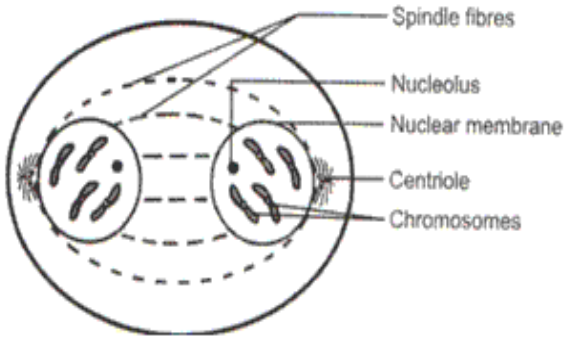
1. Overproduction
2. Struggle for existence

3. Variation
4. Survival of the fittest

**Answer 5**

**(a)**

(i) Anaphase. The sister chromatids are separated and are moving to opposite poles.
(ii) 1. Centrioles; 2. Spindle fibres; 3. Chromatid
(iii) In the given diagram, there are four pairs of chromosomes.
(iv) Telophase follows anaphase.
(v) Telophase:




**(b)**

(i) Increasing population has already out-pressured the limited resources of fossil fuels. It takes millions of years for the formation of fossil fuels. In order to conserve the limited resources of fossil fuels, there is an increasing dependence today on natural sources of energy such as sunlight and wind.
(ii) The medulla oblongata controls involuntary activities such as heart beat and breathing. Injury to the medulla oblongata will lead to the stoppage of these important functions. This results in death.
(iii) Gametes are formed by the process of meiosis. Meiosis is responsible for maintaining the constant number of chromosomes in a species. During fertilisation, if the gametes with half the number of chromosomes are fused, then the chromosomes number is restored in the zygote. Therefore, gametes have a haploid number of chromosomes.
(iv) The broadness of leaves provide greater surface area for the absorption of light. Also, the thinness ensures the immediate trapping of light energy by leaf cells. Therefore, green leaves are thin and broad.
(v) At high temperatures, the warm air is able to hold more water vapour which ultimately increases the evaporation rate by plants. Therefore, at high temperature, transpiration is high.

**Answer 6**

**(a)**

(i) When excess organic matter and nutrients are discharged into water bodies and they accumulate in the slow moving water, the algae use them as a source of food and start multiplying. This rapid proliferation of algae is called an algal bloom. Control of algal bloom:

1. Minimal use of detergents and soaps to keep the water sources free from pollution.
2. Judicious use of chemical fertilisers. Use of organic fertilisers such as vermicompost and green manure.

(ii) The various measures adopted to control soil pollution are

1. Both domestic and commercial wastes should be disposed in sanitary landfills, on vacant lands, where wastes is collected in layers, and then covered with soil.
2. Use of incinerators must be mandatory for biomedical use.
3. Use of vermicompost or green manure in place of chemical fertilisers.

(iii) CFC - Chlorofluorocarbon
DDT - Dichlorodiphenyltrichloroethane
BOD - Biochemical oxygen demand
PAN – Peroxyacetyl nitrate

**(b)**

(i) The defect is hypermetropia.
(ii) In case of hypermetropia, the person cannot see near objects clearly.
(iii) Causes of hypermetropia:

1. The lens is flattened.
2. The eyeball is shortened from front to back.

(iv) Hypermetropia can be rectified by using a converging lens, i.e. convex lens.
(v) The image which falls on the retina of a normal eye is inverted, real and diminished.

**Answer 7**

**(a)**

(i) Veins.

(ii) Valves are present inside the blood vessels.

(iii) Blood flowing through the veins is at low pressure and moving against gravity; hence, it tends to flow downwards, filling the pocket-shaped valves which close. The closing of valves thus prevents the backflow of the blood.

(iv) Valves are present at the opening of the aorta and the pulmonary artery.

(v) The heart is located towards the top of the figure.

**(b)**

(i) 1. Sclera; 2. Iris; 3. Pupil

(ii) There is a change in the size of the pupil from A to B.

(iii) Circular muscles of the iris bring about the change in the size of the pupil.

(iv) The sclerotic layer covers the coloured part of the eye.

(v) Presbyopia occurs in old people where the lens loses its flexibility resulting in far sightedness.

Astigmatism is a defect in which some parts of the object are seen in focus while others are blurred. It arises due to the uneven curvature of the cornea.