ICSE Board
Class IX Biology
Sample Paper – 4 Solution

SECTION - I

Answer 1

(a)

(i) Tonoplast
(ii) Vessels, tracheids, xylem parenchyma, fibres
(iii) Ptyalin
(iv) Mucus
(v) Phloem

(b)

(i) Pepsin converts proteins to **proteases**.
(ii) The condition wherein the androecium matures earlier than the gynoecium is called **protandry**.
(iii) Removal of hair from the skin of animals during the formation of leather is called **tanning**.
(iv) The single cotyledon of a maize seed is called **scutellum**.
(v) In 1910, **salvarson** killed the germs of syphilis and sleeping sickness.

(c)

(i) True
(ii) False.
Correct Statement - Pancreatic juice contains three kinds of enzymes viz. amylopsin, trypsin and steapsin.
(iii) False.
Correct Statement - Seeds without endosperm are called exalbuminous or non-endospermic seeds.
(iv) False.
Correct Statement - Canines are used for tearing the food.
(v) False.
Correct Statement – The term 'antibiotic' was coined by Selman Waksman in 1942.

(d)

(i) Human cells contain **23 pairs** of chromosomes.
(ii) **Ginger** is an underground stem.
(iii) The heat-regulating centre is located in the **hypothalamus**.
(iv) During snakebite, a person is given **antivenin** injection
(v) Haemophilia is a **genetic** disease.

(e)

(i) Ischium. (It is a bone of the pelvic girdle while the jejunum, duodenum and ileum are the regions of the small intestine.)
(ii) Boric acid. (Boric acid is an antiseptic while the phenol, cresol and formalin are disinfectants)
(iii) Vitamin B_1. (It is a water soluble vitamin while vitamin K, A and D are fat soluble.)
(iv) Typhoid. (It is a bacterial disease while mumps, small pox and polio are viral diseases.)
(v) Liver. (It is not a part of the digestive tract but the mouth, stomach and small intestine are parts of the digestive tract.)

Please note that the information provided in brackets is to help you in your learning. It does not have to be included in your answer.

(f)

Column A	Column B
(i) Ptyalin	c. Starch
(ii) Trypsin	a. Proteins
(iii) Lipase	b. Fats
(iv) Lactase	e. Lactose
(v) Invertase	d. Sucrose

(g)

(i)

Tendon	Ligament
Tendon is made up of white fibres.	Ligament is formed of yellow fibres.

(ii)

Photosynthesis	Respiration
The end product of photosynthesis is oxygen.	The end product of respiration is carbon dioxide.

(iii)

Kingdom Monera	Kingdom Protista
In the Kingdom Monera, the nuclear material is not well organised and scattered in the cytoplasm.	In the Kingdom Protista, the nuclear material is bound by the nuclear membrane and it is distinct.

(iv)

Liver fluke	Earthworm
A liver fluke is without a body cavity.	An earthworm shows the presence of a true body cavity.

(v)

Anopheles	*Culex*
Eggs of the *Anopheles* mosquito are laid singly and horizontally.	Eggs of the *Culex* mosquito are laid in rafts and are erect.

(h)

(i) 1– Bile duct
2 – Pancreas
3 – Cystic duct
4 – Gall bladder
5 – Pancreatic duct

(ii) Part 5 i.e. the pancreatic duct opens into the duodenum.

(iii) Amylopsin and trypsin

(iv) The fluid that flows in part 1 i.e. the bile duct is the bile. Bile, decreases the surface tension of fats, and breaks them down into tiny droplets. This process is called emulsification which makes the further digestion of fats easy.

SECTION-II

Answer 2

(a)

(i) 1 – Mouth, 2 - Oesophagus, 3 - Stomach, 4 – Pancreas, 5 - Small intestine, 6 - Large intestine, 7 – Anus, 8 – Liver, 9 - Caecum

(ii) In Part 1 i.e. the mouth, the starch is converted into maltose by the action of ptyalin.

Part 5 i.e. the small intestine, is the site of all enzymatic reactions to complete the digestion of food. It is also the site of absorption of digested food.

(iii) Part 9 i.e. the caecum of the rabbit, is longer than that of man. In the case of the rabbit, the caecum contains some bacteria which produce certain enzymes that digest cellulose. In man, cellulose in not digested due to the absence of cellulose-digesting bacteria.

(b)

(i) 1 – Cell, 2 - Centrosome, 3 - Endoplasmic reticulum, 4 - Nucleus, 5 - Cytoplasm, 6 - Golgi bodies, 7 - Vacuole, 8 - Mitochondrion

(ii) Centrosomes

(iii) Part 1 i.e. the cell membrane is a semi-permeable membrane which allows certain substances to pass through it.

(iv) Part 1 i.e. the cell membrane is semi-permeable, but the cell wall is freely permeable.

Answer 3

(a)

(i)

(a) Balloons – Lungs
(b) Rubber sheet – Diaphragm
(c) Bell jar – Rib cage

(ii) When the rubber sheet is pulled down, the balloons will inflate.

(iii) At the time of inspiration, the diaphragm contracts and flattens, which results in the increasing of the thoracic cavity, so that more volume of air can be accommodated. At the time of expiration, the diaphragm relaxes, thus bringing the thoracic cavity back to the normal size.

(iv) The pulling of the rubber sheet indicates inspiration.

(d)

(i) The given figure shows the cross section of the phloem tissue.

(ii) 1 - Sieve tube
2 - Phloem parenchyma.
3 - Companion cell

(iii) The given structure i.e. the phloem is found in all parts of the plant body i.e. roots, stems leaves, etc.

(iv) Part 1 i.e. sieve tubes help in the longitudinal transmission of food from the leaves to the storage organs or the growing parts of the plant.

Answer 4

(a)

(i) Functions of the skin:

1. Protection: The skin protects the underlying tissues and internal organs from any mechanical damage. It acts as a barrier, and prevents loss of water due to evaporation, so that essential nutrients and body fluids are retained inside the body. The skin, prevents the entry of harmful substances or infectious agents inside the body. It protects the body against harmful ultraviolet light.

2. Sensation: The skin, serves as a sensory organ and enables our body to react to heat, cold, touch, pressure, pain, vibration and injury.

3. Temperature regulation: The skin, prevents energy loss from the body. It conserves body heat in cold weather and facilitates loss of heat in hot weather.

4. Storage of food: The skin, acts as a storehouse of energy by storing reserve food in the form of fat in the hypodermis.

5. Synthesis of Vitamin D: The skin, has the ability to synthesise a small quantity of Vitamin D in the presence of sunlight.

6. Excretion: The skin helps in removing wastes from the body in the form of sweat.

Write any three of the above functions in your answer.

(ii)

- They start working instantaneously.
- They are not dependent on previous exposure to infections.
- They are effective against a wide range of potentially infectious agents. (any three)

(b)

(i) Degenerative diseases are diseases which are caused because of the deterioration in the structure and function of body organs in old age. These diseases are non-infectious diseases.
Examples –
Arthritis: It is usually caused due to the inflammation of joints due to deteriorating metabolism.
Heart attack: It is caused when the cardiac muscles are unable to contract and relax rhythmically.

(ii) Though a whale lives in water it is a mammal because of the following reasons:
1. It gives birth to young ones and suckles them.
2. It breathes through lungs.
3. It has a four chambered heart.

On the other hand a fish breathes through gills and its heart is two chambered.

Answer 5

(a)

(i) Functions of carbohydrates:
1. Carbohydrates are the major source of energy.
2. They also regulate fat metabolism.
3. They help in normal bowel movements.

(ii) A diet which contains adequate quantities of all the nutrients is called a balanced diet.
Importance of a balanced diet:
1. It helps to maintain normal mental and physical status.
2. It enables increased work capacity.
3. It helps to build up resistance to diseases.
4. It helps in the fast growth of the body.

(b)

(i) 1 - Nasal Cavity, 2 - Hard palate, 3 - Soft palate, 4 - Epiglottis, 5 - Oesophagus, 6 - Larynx, 7 - Cartilage rings, 8 - Trachea, 9 - Cut end of ribs, 10 - Bronchus, 11 - Bronchiole, 12 - Alveolus, 13 - Right lung, 14 - Diaphragm, 15 - Pleural membrane.

(ii) Lungs are protected by the ribcage and the pleural membranes.

(iii) Part 12 i.e. the alveolus increases the surface area for gaseous exchange between the lungs and blood.

(iv) The C-shaped rings of cartilage that line the trachea support the walls of the trachea and thereby, prevent the collapsing of the trachea.

(v) Nasal cavity → Nasopharynx → Larynx →Trachea → Bronchi and Bronchioles → Alveolar ducts → Alveolar air sacs → Pulmonary alveoli.

Answer 6

(a)

1. Pepsin: Converts proteins into proteases and peptones.
2. Trypsin: Hydrolyses proteins into peptones and polypeptides.
3. Lipase: Hydrolyses fats into fatty acids and glycerol.
4. Rennin: Converts the milk protein caseinogen into insoluble casein.
5. Sucrase: Hydrolyses sucrose into monosaccharides.

(b)

1. 1 - Enamel, 2 - Dentine, 3 - Blood capillaries, 4 - Gum, 5 - Cement, 6 - Jaw bone, 7 - Neck, 8 - Pulp
2. The enamel is the hardest part of the tooth.
3. The pulp containing blood capillaries is the living part of the tooth.

Answer 7

(a)

(i) 1 – Pollen tube, 2 - Nucellus, 3 - Embryo sac, 4 - Endosperm nucleus, 5 - Egg cell, 6 - Synergids, 7 - Integument, 8 - Micropyle, 9 - Germinating pollen.

(ii) Part 1 is the pollen tube. A pollen grain reaches the stigma, absorbs nutrients secreted by the stigma and starts to grow as a pollen tube.
The intine of the pollen grain grows into a tube and passes through the style by dissolving its tissue by enzyme action.

(iii) Part 2 i.e. the nucellus is a nutritive tissue.

(b)

(i) An antibiotic is a chemical substance produced by a living organism which can stop the growth of some disease producing fungi or bacteria.

(ii) Criteria for a good antibiotic:

1. An antibiotic should be able to kill a variety of disease-producing microorganisms.
2. It should not produce any undesirable effects.
3. It should not kill the normal bacteria of the host.

(iii) Uses of antibiotics:

1. Antibiotics are used as food preservatives for fish and meat.
2. They are also used to treat animal feed.
3. They are used to control the growth of plant pathogens.