

**ICSE Board**  
**Class IX Biology**  
**Sample Paper – 2 Solution**

**SECTION-I**

**Answer 1**

**(a)**

- (i) Complete flower
- (ii) Monoecious plant
- (iii) AIDS
- (iv) Gamosepalous
- (v) Ribosomes

**(b)**

- (i) In ex-albuminous seeds, the food material is stored in **cotyledons**.
- (ii) Tomato is a **true fruit**.
- (iii) A fruit is a ripened **ovary**.
- (iv) The respiratory pigment present in the blood is **haemoglobin**.
- (v) **Lipase** enzyme converts fats into fatty acids.

**(c)**

Column A	Column B
(i) Penicillin	Antibiotic
(ii) Cell wall	Plant cells
(iii) Plants without roots, stem and leaves	Thallophyta
(iv) Centrosome	Animal cells
(v) Moss	Bryophyta

**(d)**

- (i) The figure is of the synovial joint.
- (ii) 1 - Ligament  
2 - Synovial membrane  
3 - Synovial fluid  
4 - Cartilage
- (iii) **Ball and socket joint**: In the ball and socket joint, the ball-shaped bone moves within the cup-shaped cavity of another bone. Movement in all directions is possible in this type of joint.

(e)

- (i) *Spirogyra*. It is an alga while Yeast, *Rhizopus* and *Mucor* are fungi.
- (ii) Crab. It belongs to the Class Crustacea while butterfly, housefly, and ant belong to the Class Insecta.
- (iii) Nymph. It is an immature form of insects while egg, larva and pupa are the stages of the life history of insects.
- (iv) Mumps. It is an infectious disease while beri-beri, scurvy and goitre are non-infectious diseases.
- (v) Liver is associated with the digestive system while the mouth, stomach and the small intestine are the structures of the digestive tract.

(f)

- (i) True.
- (ii) False.
- (iii) True.
- (iv) False.

Correct Statement: Insects have three pairs of legs.

- (v) True.
- Correct Statement: Intercostal muscles help in external respiration or breathing.

***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.***

(g)

(i) Ribosome	Synthesis of proteins
(ii) Centrosome	Cell division in an animal cell
(iii) Haustoria	Absorption of food in parasites
(iv) Epiglottis	Closes the glottis while swallowing food
(v) Glenoid cavity	Articulation of humerus

(h)

- (i) Vitamin D: Vitamin D helps body to use calcium and phosphorus to form the bones and the teeth.
- (ii) Sepals: Sepals protect the inner parts of the flower in the bud stage and help to carry out photosynthesis, if they are green in colour.
- (iii) Chloroplast: A chloroplast helps in photosynthesis by trapping the light energy.
- (iv) Endosperm: The endosperm provides nourishment to the growing embryo.
- (v) Golgi bodies: The Golgi bodies secrete hormones, enzymes, etc. They are also responsible for the formation of the acrosome of sperms.

**SECTION-II****Answer 2**

**(a)** Experiment to show that heat is given out during respiration.

1. Apparatus: Two thermos flasks, germinating seeds, dry seeds, cotton, two thermometers.

2. Procedure:

- Take two thermos flasks, mark them as A and B.
- Keep some germinating seeds in flask A and dry seeds in flask B.
- Insert a thermometer in each of the flasks such that the bulbs are completely covered with the seeds.
- Close the mouth of the flasks with a cork. Note down the initial temperature.
- After two days, again note down the temperature.

3. Observation:

After two days, there is a rise in the temperature of flask A, showing that germinating seeds respire and produce heat.

There is no change in flask B since the flask contains dry seeds.

**(b)**

(i) Areolar tissue.

(ii) 1 - Matrix

2 - White fibres

3 - Yellow fibres

(iii) Functions of the areolar tissue:

It joins skin to muscles.

It connects various body parts and fills the spaces between adjacent tissues.

It also helps in repairing of tissues.

(iv) Areolar tissue lies under the skin.

It is found around the muscles, blood vessels and nerves.

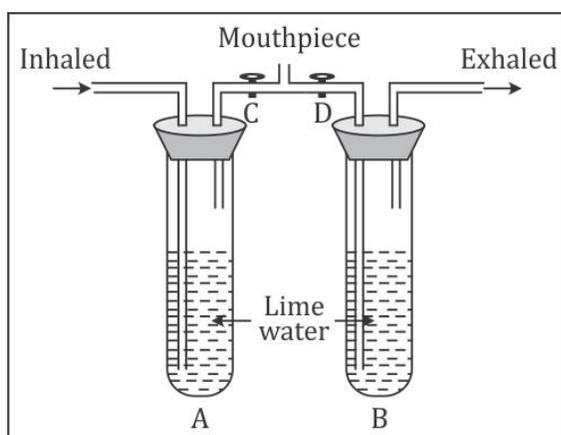
**Answer 3**

**(a)**

- (i) 1 – Cristae  
2 - Outer membrane  
3 - Matrix
- (ii) Mitochondria help in cellular respiration.
- (iii) Mitochondria are sites of cellular respiration. They use molecular oxygen, to oxidize carbohydrates and fats present in the cell to carbon dioxide and water. Oxidation of carbohydrates and fats results in the formation of energy. Since, all the energy required by the body is synthesised in mitochondria they are called powerhouses of the cell.

**(b)**

- (i) Corrected diagram:



- (ii) The aim of the experiment is to demonstrate that exhaled air contains more  $\text{CO}_2$ .
- (iii) Limewater
- (iv) The limewater in flask B turns more milky than that in flask A. This is because the air passed through flask B was exhaled air.

**Answer 4**

**(a)**

- (i) 1- Sweat pore  
2 - Sebaceous glands  
3 - Sweat gland  
4 - Fat cells  
5 – Dermis  
6 - Stratum malpighii  
7 - Stratum corneum  
8 – Epidermis  
9 - Hair shaft

- (ii) When the temperature rises, the skin helps to lose extra heat by sweating and dilation of blood vessels. When the temperature falls, sweating is less and the blood vessels constrict.
- (iii) Part 3 (Sweat gland) – Sweat glands produce sweat to control body temperature. Sweat also contains certain excretory products.  
  
Part 4 (Fat cells) – Fat cells store fat to insulate the body heat.  
  
Part 9 (Hair shaft) – The hair shaft helps to keep the body warm.
- (iv) The excretory substances present in sweat are urea and salt.

**(b)**

- (i) Postulates of the cell theory:
  1. The cell is the smallest unit of structure of all living things.
  2. The cell is the unit of function of all living things.
  3. All cells arise from pre-existing cells.
- (ii) Triple fusion: It is the process in which one of the sperm nucleus unites with the secondary nucleus (two polar nuclei). Together, these nuclei form the triploid nucleus of the cell, from which the nutritive endosperm develops, that will provide energy for the embryo's growth and development.

**Answer 5****(a)**

- (i) Communicable diseases are diseases which are transmitted from one person to another person by infectious agents or pathogens. E.g. mumps, AIDS.
- (ii) BCG: Bacillus Calmette Guerin  
AIDS: Acquired immunodeficiency syndrome

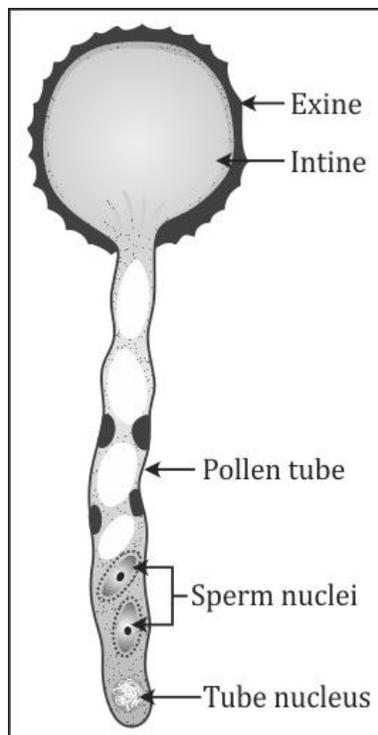
**(b)**

- (i) Epigeal germination: In epigeal germination, the cotyledons are pushed above the soil by the elongation of the hypocotyl. E.g. Bean seed.
- (ii)
  - (1) Tidal volume: Air breathed in and out in normal quiet breathing is called tidal volume. It is 500 mL.
  - (2) Vital capacity: The volume of air that can be taken in and expelled by maximum inspiration and expiration is called vital capacity. It is 4500 mL.

**Answer 6**

**(a)**

(i) Developing Pollen grain:



(ii) One male gamete or sperm nucleus approaches the egg cell, enters, and fuses with the egg cell nucleus to form a diploid zygote. This is known as first fertilisation. The second male gamete moves towards the centre, fuses with a secondary nucleus, or with two polar nuclei within the embryo sac to form endosperm or endosperm nucleus. This is called secondary fertilisation. As fertilisation occurs twice, the process is called double fertilisation.

**(b)**

(i) Malaria is a disease caused by a protozoan *Plasmodium*. It is spread by the bite of the female *Anopheles* mosquito. Its symptoms are high fever and chills.

(ii)

1. Housefly
2. Cholera, typhoid
3. The housefly sits on garbage, decaying organic matter, etc. The disease-causing germs get transferred to its body parts especially its hairy and spiny legs. When such a fly sits on eatables, it contaminates them. When a fly sits on food items, it moistens the food with its saliva which results in food contamination. Sometimes a fly also deposits its excreta while feeding on food items, thus contaminating them.

**Answer 7**

- (i) *Entamoeba histolytica* is a parasite. It lives in the intestine of man. So, excess water does not enter its body. Therefore, it has no contractile vacuole.
- (ii) Wisdom teeth appear last at an age of about 17 to 20 years when the human body is reaching maturity. By this age it is considered that the humans attain wisdom and hence it is called wisdom tooth.
- (iii) The coconut fruit has a fibrous mesocarp, which provides buoyancy and can be easily dispersed through water. Therefore, coconuts are seen floating on water.
- (iv) The nose contains hair and mucous which traps dust particles and bacteria. As a result, only pure air enters into the lungs. However, the mouth does not have a similar first line of defense and so the air breathed through the mouth is not pure. Therefore, one should breathe through your nose and not through your mouth.
- (v) Fungi do not have chlorophyll and so, they cannot make their own food. They have to depend on green plants for their food. Hence, fungi are heterotrophic.