

BIOLOGY (314)

SECTION–A

1. Name of the technique used for detecting genetic disorders in a foetus is

- (A) amniocentesis
- (B) ultrasound
- (C) X-ray
- (D) MRI

Answer: (A) amniocentesis.

Explanation:

Amniocentesis is the technique used to detect genetic disorders in a fetus.

2. Which of the following makes up the final trophic level in a food chain?

- (A) Parasite
- (B) Producer
- (C) Decomposer
- (D) Carnivore

Answer: (C) Decomposer

Explanation:

Decomposers make up the final trophic level in a food chain

3. The largest lymphoid organ in the human body is

- (A) bone marrow
- (B) thymus
- (C) adrenal
- (D) spleen

Answer: (D) spleen

Explanation:

The spleen is the largest lymphoid organ in the human body

4. Cephalothorax is a characteristic feature present in the phylum

- (A) Echinodermata
- (B) Mollusca
- (C) Arthropoda
- (D) Annelida

Answer: (C) Arthropoda.

Explanation:

Cephalothorax is a characteristic feature present in the phylum Arthropoda

5. When both male and female flowers are present on the same plant, the plant is said to be

- (A) unisexual
- (B) monoecious
- (C) dioecious
- (D) bisexual

Answer: (B) monoecious.

Explanation:

When both male and female flowers are present on the same plant, the plant is said to be monoecious

6. Excessive intake of iron in diet causes

- (A) scurvy
- (B) hypervitaminosis
- (C) anaemia
- (D) hemosiderosis

Answer: (D) hemosiderosis.

Explanation:

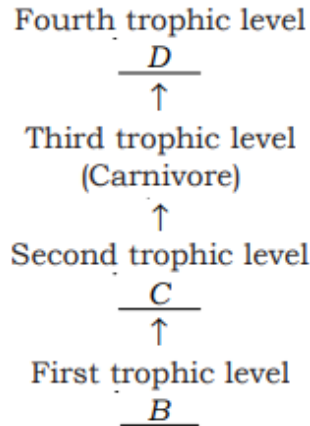
Excessive intake of iron in the diet can lead to hemosiderosis, which involves large deposits of iron in the liver

SECTION-B

17.

Fill in the blanks (attempt any *two* from A to D) :

The flowchart given below is a diagrammatic representation of trophic levels in a A in an ecosystem :



Answer:

A: The ecosystem referred to in this diagram is a food chain.

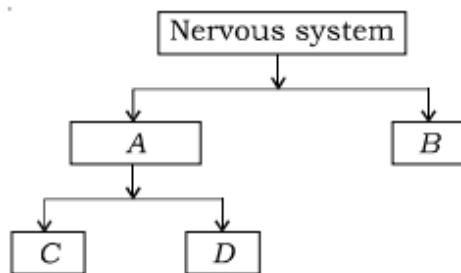
B: The first trophic level refers to Producers, which are plants.

C: The second trophic level represents Herbivores, which consume the producers (plants).

D: The third trophic level, typically a Carnivore, consumes the herbivores .

18.

Complete the flowchart with the basic components of the nervous system (attempt any *two* from A to D) :



Answer:

A: Central Nervous System

B: Peripheral Nervous System

C: Brain

D: Spinal Cord

19. Choose the odd one in each of the following :

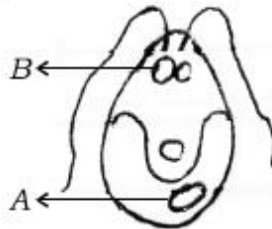
- (a) Ovary → Fallopian tube → Ureter → Vagina
(b) Graafian follicle → Leydig cells → Corpus luteum

Answer:

- (a) **Ureter** – This is not part of the female reproductive system, while the others (ovary, fallopian tube, vagina) are.
(b) **Leydig cells** – These are found in the male reproductive system, whereas Graafian follicle and corpus luteum are related to the female reproductive system .

20.

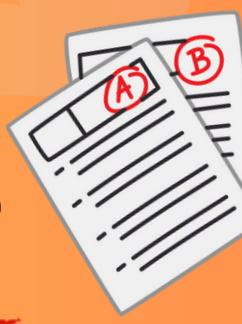
Draw the diagram as given below in your answer-book and label the parts marked A and B in the following diagram :



Answer:

- A: Represents the **Hypothalamus**
B: Represents the **Pituitary Gland**

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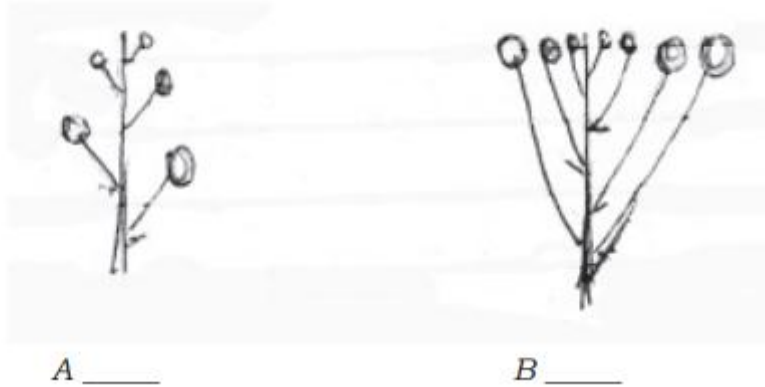
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28.

Identify the type of inflorescence of the diagram given below :



Answer:

- A: Corymb
B: Umbel

SECTION-C

29. Write the main functions of B-cells and T-cells in the immune system.

Answer:

B-cells:

1. Initiate antibody-mediated immune response.
2. Transform into plasma cells which secrete antibodies, and are responsible for producing antibodies that target specific antigens

T-cells:

1. Regulate the immune response.
2. Mediate cell-mediated immunity (CMI) response.
3. Induce B-cells to produce antibodies

30. Name the two diseases caused by the deficiency of protein or carbohydrate or both in the diet of a child. Also list any two characteristic symptoms of any one deficiency disease.

Answer:

The two diseases caused by the deficiency of protein or carbohydrates in the diet of a child are:

1. Marasmus
2. Kwashiorkor

Symptoms of Kwashiorkor:

- i. Underweight with a protruding belly.
- ii. Dark and scaly skin.
- iii. Swelling of legs and feet due to water retention (oedema)

31. What are meristems? Write the location of the following meristems in the plant :

- (a) Apical meristem
- (b) Lateral meristem

Answer: Meristems are tissues in plants consisting of actively dividing cells that are responsible for growth.

(a) **Apical Meristem:** Found at the tips of roots and shoots. It is responsible for the growth in length (primary growth) of the plant.

(b) **Lateral Meristem:** Located along the sides of stems and roots. It is responsible for the growth in thickness (secondary growth) of the plant

SECTION–D

38. With the help of diagrams, briefly explain the following types of placentations found in the angiosperms. Give one suitable example in each case :

- (a) Marginal
- (b) Axile
- (c) Parietal

Answer:

(a) **Marginal Placentation:** In this type of placentation, the ovary is monocarpellary and unilocular (one-chambered). The ovules are arranged along the fused margins of the single carpel. An example is **pea**.



(b) **Axile Placentation:** The ovary is polycarpellary and syncarpous (carpels fused together), with multiple chambers. The ovules are attached to a central axis formed by the fusion of the carpels' margins. An example is **tomato**.



(c) **Parietal Placentation:** The ovary is polycarpellary and syncarpous but unilocular (one-chambered). The ovules are attached to the inner wall where the margins of adjacent carpels meet. An example is **mustard**.



41. (a) Write the differences between blood and lymph.
(b) With the help of flowchart, only show the route of blood flow and lymph flow in the human body

Answer:

Blood	Lymph
Red in color due to hemoglobin	Colorless fluid
Flows rapidly through arteries and veins	Flows slowly in lymphatic vessels
Contains RBCs, WBCs, platelets, and plasma	Contains plasma and WBCs only

Flowchart for blood and lymph flow:

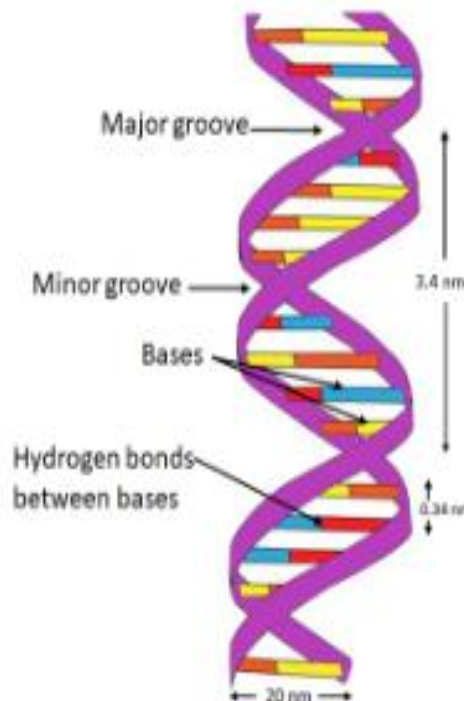
Blood Flow: Heart → Arteries → Capillaries → Veins → Heart

Lymph Flow: Tissue Spaces → Lymph Capillaries → Lymph Vessels → Subclavian Vein → Heart

42. (a) Draw a neat diagram of a double-helical structure of DNA and label the main components.
(b) Distinguish between nucleoside and nucleotide.

Answer:

a)



b)

- **Nucleoside:** Composed of a nitrogenous base attached to a sugar molecule (ribose or deoxyribose), without any phosphate group.
- **Nucleotide:** Consists of a nitrogenous base, a sugar, and one or more phosphate groups.

The main difference is that nucleotides have phosphate groups, whereas nucleosides do not

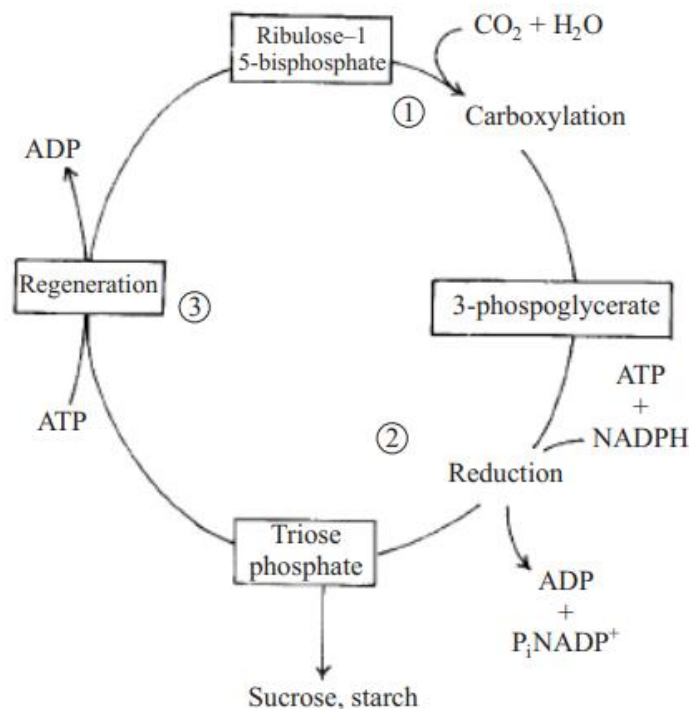
43. (a) Mention the end products of the light reaction in photosynthesis.
 (b) Draw the diagrammatic representation of the Calvin cycle.
 (c) What is photorespiration?

Answer:

- a) **End products of the light reaction in photosynthesis:**

The primary end products of the light reaction are **ATP** and **NADPH** (which are used in the Calvin cycle), and **oxygen (O₂)** as a by-product

b)



- c) **Photorespiration:** Photorespiration occurs when the enzyme **RuBP carboxylase (Rubisco)** oxygenates RuBP instead of carboxylating it. This process is wasteful as it leads to the production of CO_2 instead of fixing it, with no ATP production and a loss of about 25% of carbon that had been fixed by the plant during photosynthesis

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