### CBT SEPTEMBER 2023 CLASS – XI: BIOLOGY

#### **GENERAL INSTRUCTION :**

# SCORE AND REVIEW OF ALL THE QUESTIONS WILL BE PROVIDED IN THE EMAIL TO ALL THE STUDENTS ON NEXT DAY AND AFTER CLOSING OF QUIZ TIME.

#### *IMPORTANT : ALL THE STUDENTS SHOULD FILL THE CORRECT SCHOOL NAME FROM DROP DOWN BUTTON*

#### CHAPTERS COVERED:

Chapter- Morphology of flowering plants, Anatomy of flowering plants and Structural organisation in animals.

**Q.1**: The manner in which the Plantae are distributed in the ovary is called Placentation and it is helpful in classification. In a simple ovary (Formed of one carpel) there is only one type of placentation.

• Marginal: the ovary is single-chambered and the ovules are attached to the Plantae that develop along the ventral suture i.e., along the fused margins of the carpel. i.e., ventral suture, as in pea, Gram, Bean, Cassia.

In compound ovaries, the placentation may be parietal, axile, free central, basal, or superficial.

- Parietal: the ovary is compound and unilocular. the margins of the carpels swell up to form Plantae as is found in cucumber, melon, Brassica, argemone etc.
- Axile: the gynoecium is polycarpellary and syncarpous. the fused margins of the carpels run inwards and meet in the center of the ovary. the ovary becomes multilocular, and the marginal Plantae of all the carpels fused in the center to form a central or axile column to which the ovules are attached as in china rose, potato, tomato.
- Free central: the ovary is compound and unilocular. the ovules are borne on a central axis arising from the base of the ovary and not on the fused margins of the carpels as in dianthus, Primrose (Primulaceae).
- Basal: the ovary is unilocular and the Plantae develops directly on the thalamus and the single ovule is attached to the Plantae at the base of the ovary as in sunflower.



When ovary is one chambered, the possibility of placentation is
A. Basal B. Marginal C. Axile D. Free central
A. A, B & C
B. B, C & D
C. C. A, B, C & D
D. D. A, B & D
Answer - (D) A, B & D
FEED BACK :- Axile placentation is seen in multilocular ovary.

2. Match column I with column II and select the correct option from the given codes.

Column IColumn IIA. Marginal(i) Sunflower, marigoldB. Parietal(ii) PeaC. Axile(iii) Mustard, ArgemoneD. Free central(iv) Hibiscus, tomato, lemonE. Basal(v) Dianthus, Primose

- A. A-(ii), B-(iii), C-(iv), D-(v), E-(i)
- B. A-(i), B-(iii), C-(ii), D-(v), E-(iv)
- C. A-(i), B-(ii), C-(iii), D-(iv), E-(v)
- D. A-(iii), B-(ii), C-(iv), D-(v), E-(i)

**Answer -** (A). A-(ii), B-(iii), C-(iv), D-(v), E-(i)

#### **FEED BACK:**

(A) Marginal - Pea (ovules attached at the margin, fusion line of two carpels

- (B) Parietal Mustard, Argemone (ovules attached along the periphery of the locules)
- (C) Axile Hibiscus, Tomato, Lemon (ovules attached at the central axis in the locules)

(D) Free - Dianthus, Primrose (free central, ovules arise around the central axis of the ovary, here locules are absent)

(E) Basal - Sunflower, Marigold (ovules arise or are attached at the base of the ovary)

So, the correct answer is (A).

3. What is the type of placentation in which ovules are borne on central axis without septa

- A. Parietal, e.g. Primrose
- B. Axile, e.g. China rose
- C. Free central, e.g. Dianthus
- D. Marginal, e.g. Pea
- Answer (C) Free central, e.g. Dianthus

**FEED BACK**:- When the ovules are borne on central axis and septa are absent, as in Dianthus and Primrose the placentation is called free central.

4. Assertion:The placentation in which the placenta forms a ridge along the ventral suture of ovary and ovules are borne on this ridge forming two rows is called parietal placentation. Reason:The marginal placentation has ovules developed on the inner wall of the ovary or on peripheral part. A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion and reason are false.

**Answer** : (D) If assertion and reason are false.

**FEED BACK** : In marginal placentation, one or two alternate rows of ovules occur longitudinally along the ridge in the wall of the ovary in the area of fusion of its two margins or ventral suture, A true parietal placentation two or more longitudinal placentae develop along the wall of a syncarpous or compound pistil.

**Q.2:** Three-dimensional digital image construction of metaxylem vessels in root tips of Zea mays subsp. mexicana from thin transverse sections

Young plant roots share a common architecture: a central vascular cylinder surrounded by enveloping cylinders of ground and dermal tissue produced by an apical promeristem. Roots with closed apical organization can be studied to explore how ontogeny is managed. The analysis of transverse and longitudinal sections has been the most useful approach for this, but suffers from limitations. We developed a new method that utilizes digital photography of transverse sections and three-dimensional (3D) computer virtual reconstructions to overcome the limitations of other techniques.

#### Methods

Serial transverse sections of teosinte root tips (Zea mays subsp. mexicana) were used to construct longitudinal images, 3D images, and an animated 3D model. The high-resolution, high-contrast, and low-distortion sectioning method developed previously by the authors enabled high-quality virtual image construction with the aid of a standard laptop computer.

#### Results

The resulting 3D images allowed greater insight into root tissue ontogeny and organization, especially specific cellular structures such as histogen layers, xylem vessels, pericycle, and meristematic initials.



1. Which of the following correctly represents the position of Casparian strips in root endodermal cells?



#### Answer. (a)

**FEED BACK:** Casparian strips are a cellular feature found in the roots of all higher plants. They are ring-like, hydrophobic cell wall impregnations. These impregnations occur in the endodermis, an inner cell layer that surrounds the central vascular strand of roots

2. Following table, summarises the differences between a monocot root and a dicot root. Identify the incorrect differences and select the correct option.

1. <sup>1</sup>	Characters	Monocot root	Dicot root
(i)	Vascular bundle	Polyarch, <i>i.e.,</i> more than 6 vascular bundles	Diarch to hexarch, <i>i.e.</i> , 2 - 6 vascular bundles
(ii)	Cambium	Absent	Present, so secondary growth occurs
(iii)	Pith	Poorly developed	Well developed large pith
(iv)	Activity of pericycle	Gives rise to secondary roots and cork cambium	Gives rise to lateral roots only

a) i and iii b) i and iv c) iii and iv

d) ii and iii

#### Answer. c) iii and iv

**FEED BACK:** Pith is large and well developed in monocot roots. Monocot roots do not undergo any secondary growth.

3. Assertion :Vascular bundles are conjoint, collateral and closed in dicot stem

Reason: Vascular bundles are conjoint, collateral and open in monocot stem

- A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion
- B. Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion
- C. Assertion is correct but Reason is incorrect
- D. Both Assertion and Reason are incorrect

Answer. D) Both Assertion and Reason are incorrect

**FEED BACK:** In dicot stem, each vascular bundle consists of phloem on the outer side, xylem towards the inner side and a strap of cambium in between the two. Phloem and xylem tissues lie on the same radius . Such vascular bundles are known as conjoint (with both phloem and xylem), collateral (phloem and xylem on the same radius ) and open. In monocot stem, phloem lies towards the outside and the xylem on the inner side. Cambium is absent as the whole procambium is consumed in the formation of vascular tissues. The vascular bundles are, therefore, conjoint, collateral and closed.

## Q.3: The frog has three respiratory surfaces on its body that it uses to exchange gas with the surroundings: the skin, in the lungs and on the lining of the mouth.

While completely submerged all of the frog's respiration takes place through the skin. The skin is composed of thin membranous tissue that is quite permeable to water and contains a large network of blood vessels. The thin membranous skin is allows the respiratory gases to readily diffuse directly down their gradients between the blood vessels and the surroundings. When the frog is out of the water, mucus glands in the skin keep the frog moist, which helps absorb dissolved oxygen from the air.

A frog may also breathe much like a human, by taking air in through their nostrils and down into their lungs. The mechanism of taking air into the lungs is however slightly different than in humans.

In order to draw air into its mouth the frog lowers the floor of its mouth, which causes the throat to expand. Then the nostrils open allowing air to enter the enlarged mouth. The nostrils then close and the air in the mouth is forced into the lungs by contraction of the floor of the mouth. To eliminate the carbon dioxide in the lungs the floor of the mouth moves down, drawing the air out of the lungs and into the mouth. Finally the nostrils are opened and the floor of the mouth moved up pushing the air out of the nostrils.

Frogs also have a respiratory surface on the lining of their mouth on which gas exchange takes place readily. While at rest, this process is their predominate form of breathing, only fills the lungs occasionally. This is because the lungs, which only adults have, are poorly developed.



### Frog Diagramatic L.S of Respiratory System

1. The mechanism of taking air into the lungs is however slightly different than in humans because

- A. Frogs do not have well developed and functional lungs.
- B. Frogs do not have ribs nor a diaphragm
- C. Frogs respire through skin .

D. Both 'A' and 'C'

Answer: B. Frogs do not have ribs nor a diaphragm

**FEED BACK:** Frogs do not have ribs nor a diaphragm which in humans helps serve in expand the chest and thereby decreasing the pressure in the lungs allowing outside air to flow in.

2. Which of the following statements is correct about the respiration in frog?

(i) In frog, cutaneous, buccopharyngeal and pulmonary respiration are found.

(ii) A pair of elongated pink coloured hollow sac like lungs are found in thorax.

(iii) During aestivation and hibernation, gaseous exchange takes place through skin.

- (a) (i), (ii) and (iii)
- (b) (i) and (iii) only
- (c) (ii) and (iii) only
- (d) (i) and (ii) only

Answer. (a) (i), (ii) and (iii)

**FEED BACK:** All three statements are correct (i) In frog, cutaneous, buccopharyngeal and pulmonary respiration are found. (ii) A pair of elongated pink coloured hollow sac like lungs are found in thorax. (iii) During aestivation and hibernation, gaseous exchange takes place through skin.

3. Assertion. Frog neither hibernates nor aestivates.

Reason. Frog can control its body termperature.

- A) If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.
- B) If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.
- C) If Assertion is true but the Reason is false.
- D) If both Assertion and Reason are false.

**Answer.** D) If both Assertion and Reason are false.

**FEED BACK:** Frog undergoes Hibernation (winter sleep) and Aestivation (summer sleep) both and it is an amphibian which cannot maintain its body temperature.