



BK BIRLA CENTRE FOR EDUCATION
SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY | CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL



MID TERM EXAM MARKING SCHEME 2024-25

BIOLOGY (044)

Class: XI
Date: 14/09/2024

Duration: 3 Hr
Max. Marks: 70

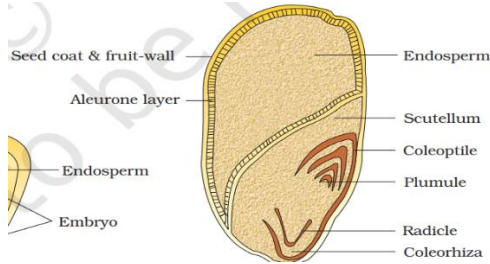
SECTION-A

- | | | |
|------|---|---|
| Q1. | (c) Deuteromycetes | 1 |
| Q2. | (c) Trypanosoma | 1 |
| Q3. | (d) water is essential for fertilization for their homosporous nature. | 1 |
| Q4. | (c) it is hygroscopic | 1 |
| Q5. | (a) flame cells | 1 |
| Q6. | (c) Epiphyllous | 1 |
| Q7. | (c) Androecium | 1 |
| Q8. | (a) (i)– T.S of dicot root (ii) – T.S of monocot root | 1 |
| Q9. | (d) Cambium present between xylem & phloem, known as open type vascular bundle. | 1 |
| Q10. | (c) Tympanum | 1 |
| Q11. | (a) Robert Brown discovered the cell | 1 |
| Q12. | (c) Adenine | 1 |
| Q13. | (b) Both A and R are true, and R is not the correct explanation of A. | 1 |
| Q14. | (d) A is false but R is true. | 1 |
| Q15. | (a) Both A and R are true, and R is the correct explanation of A. | 1 |
| Q16. | (c) A is true but R is false. | 1 |

SECTION-B

- | | | |
|------|--|----------------------|
| Q17. | Characteristic Features of Euglenoids (Any two points)
Unicellular: Euglenoids are single-celled organisms.
Pellicle: They have a flexible outer covering called a pellicle, allowing shape changes.
Flagella: Possess one or two flagella for movement | 1+1 |
| Q18. | Classification of Gymnosperms and Angiosperms
Seed Enclosure: Gymnosperms have naked seeds on cones, while angiosperms have seeds enclosed within fruits.
Reproductive Structures: Gymnosperms use cones; angiosperms use flowers. | 1+1 |
| Q19. | Characteristic Features of Class Mammalia
Hair/Fur: Presence of hair or fur for insulation.
Mammary Glands: Females have mammary glands to produce milk.
Warm-blooded, maintaining a stable body temperature.
Viviparous: Most give birth to live young. | $\frac{1}{2}$
X 4 |

Q20.



2

Q21. Fluid Mosaic Model of Plasma Membrane (Any four points)

½

Lipid Bilayer: Composed of phospholipids with hydrophilic heads and hydrophobic tails.

X 4

Fluidity: Lipids and proteins move laterally, providing flexibility.

Proteins: Integral and peripheral proteins facilitate transport and communication.

Carbohydrates: Glycoproteins and glycolipids aid in cell recognition.

Cholesterol: Maintains membrane stability and fluidity.

SECTION-C

Q22. a) Archaeobacteria:Biotechnology:*Thermophiles* are used in industrial processes.

1

b) Ascomycetes:Food Industry: Yeasts (e.g., *Saccharomyces cerevisiae*) are used in baking and brewing for fermentation processes.Ascomycetes like *Penicillium* are used to produce antibiotics such as penicillin.

1

c) Agriculture: Nitrogen-fixing bacteria (e.g., *Rhizobium*) improve soil fertility by converting atmospheric nitrogen into a form that plants can use.

1

Q23. (a) Gemmae: Small, asexual reproductive structures found in some non-vascular plants like liverworts and mosses. They develop into new individuals when detached from the parent plant.

1

(b) Prothallus: The gametophyte stage of ferns and other pteridophytes, typically a small, heart-shaped structure that produces gametes (sperm and eggs).

1

© Male Strobili: Also known as pollen cones, these are the male reproductive structures in gymnosperms, producing and releasing pollen.

1

Q24. Lightweight Skeleton: Birds have a lightweight skeleton with hollow bones to reduce body weight.

1

Feathers: Provide lift and aid in temperature regulation.

1

Strong Muscles: Well-developed pectoral muscles power the wings during flight.

1

Q25. a)Actinomorphic, Bisexual, sepals five united,petals five, united, stamens five, epipetalous, bicarpellary, syncarpous, ovary superior.

1

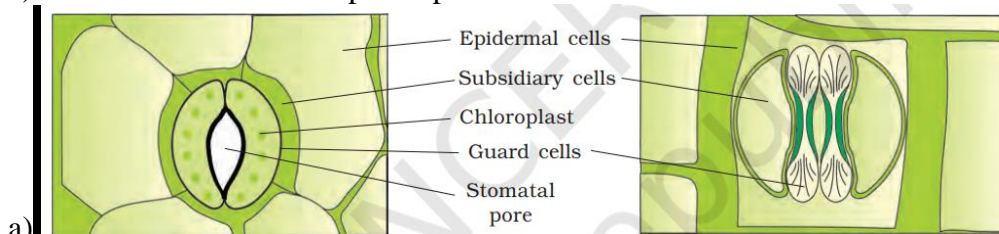
b) This family includes important crops such as potatoes, tomatoes, and eggplants, which are staple foods worldwide.

1

c) Pharmaceuticals: Some plants produce alkaloids used in medicine.

1

Q26.



2

a) b) The tangential as well as radial walls of the endodermal cells have a deposition of water-impermeable, waxy material suberin in the form of casparian strips.

1

- Q27. The skin is smooth and slippery due to the presence of mucus. The skin is always maintained in a moist condition. The colour of dorsal side of body is generally olive green with dark irregular spots. On the ventral side the skin is uniformly pale yellow. The frog never drinks water but absorb it through the skin. Body of a frog is divisible into head and trunk. A neck and tail are absent. Above the mouth, a pair of nostrils is present. 3

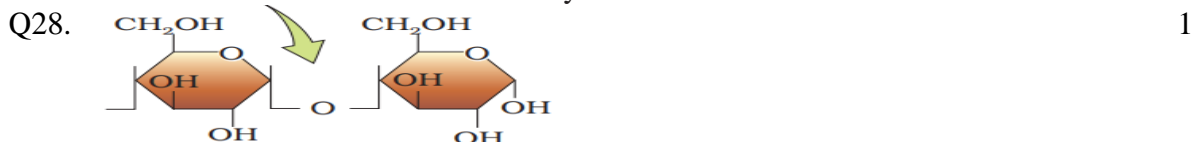
OR

The ability to change the colour to hide them from their enemies (camouflage). This protective coloration is called mimicry.

Skin acts as aquatic respiratory organ (cutaneous respiration). Dissolved oxygen in the water is exchanged through the skin by diffusion. On land, the buccal cavity, skin and lungs act as the respiratory organs.

Frogs are beneficial for mankind because they eat insects and protect the crop.

Frogs maintain ecological balance because these serve as an important link of food chain and food web in the ecosystem.



SECTION-D

- Q29. The epidermis which covers both the upper surface (adaxial epidermis) and lower surface (abaxial epidermis) of the leaf has a conspicuous cuticle. The abaxial epidermis generally bears more stomata than the adaxial epidermis. The latter may even lack stomata. 2

It has two types of cells – the palisade parenchyma and the spongy parenchyma. The bulliform cells in the leaves have absorbed water and are turgid, the leaf surface is exposed. When they are flaccid due to water stress, they make the leaves curl inwards to minimise water loss. 1

All tissues except epidermis and vascular bundles constitute the ground tissue. It consists of simple tissues such as parenchyma, collenchyma and sclerenchyma. 1

- Q30. (a) Ribozymes: Ribozymes are RNA molecules that can catalyze specific biochemical reactions, similar to protein enzymes. They are unique because they are not proteins but RNA-based enzymes. 1

(b) Co-factors: Co-factors are non-protein chemical compounds that assist enzymes during the catalysis of reactions. They can be metal ions or organic molecules and are essential for the proper functioning of many enzymes. 2

© Isomerases: Enzymes that catalyze the rearrangement of atoms within a molecule to form isomers.

Ligases: Enzymes that catalyze the joining of two molecules, often requiring energy in the form of ATP.

Factors affecting enzyme activity: Temperature, pH level, Substrate concentration
Enzyme concentration

OR

Effect of Carbonic Anhydrase on Reaction Rate:

Carbonic anhydrase significantly increases the rate of the reaction that converts carbon dioxide and water to carbonic acid (and vice versa). This enzyme allows the reaction to proceed rapidly enough to maintain physiological processes like respiration and acid-base balance.

SECTION-E

Q31. (a) Pisces: Pisces are aquatic vertebrates, primarily characterized by having gills, fins, and scales. They are cold-blooded and breathe through gills. 2

(b) Amphibia: Amphibians are cold-blooded vertebrates that can live both in water and on land. They have moist skin and usually undergo metamorphosis from a larval stage to an adult. 2

(c) Reptilia: Reptiles are cold-blooded vertebrates with dry, scaly skin. They lay shelled eggs on land and breathe with lungs throughout their life. 1

OR

(a) Direct vs. Indirect Development:

Direct Development: The organism develops into a juvenile form resembling the adult, without a larval stage. 2

Indirect Development: Involves a larval stage that undergoes metamorphosis to become an adult. 2

(b) Largest Phylum of Animalia:

Arthropoda is the largest phylum, characterized by an exoskeleton, segmented body, and jointed appendages. 1

(c) Usefulness of Parapodia and Nephridia in Annelids:

Parapodia: Aid in locomotion and respiration.

Nephridia: Function in excretion, removing metabolic wastes from the body.

Q32. (a) Digestive System of Frog: 3

Draw a diagram showing the mouth, esophagus, stomach, small intestine, large intestine, liver, pancreas, and cloaca.

(b) Role of Bile: 2

Bile emulsifies fats in the small intestine, aiding in digestion. It is stored in the gallbladder.

OR

(a) Male Reproductive System of Frog:

Draw a diagram showing testes, sperm ducts, ureters, urinary bladder, and cloaca.

(b) Role of Cloaca:

The cloaca is a common chamber into which the digestive, excretory, and reproductive systems open. It serves as an exit for urine, feces, and reproductive cells.

Q33. Cell Structure

(a) Structure of Nucleus and Centrosome: 3

Nucleus: A membrane-bound organelle containing genetic material (DNA). It controls cell activities. (Label nuclear membrane, nucleolus, chromatin).

Centrosome: An organelle that organizes microtubules during cell division. 2

(b) Centromere: A centromere is a region on a chromosome that links sister chromatids. It plays a crucial role during cell division. The position of the centromere classifies chromosomes into:

Metacentric (middle)

Submetacentric (slightly off-center)

Acrocentric (close to one end)

Telocentric (at the end)

OR

(a) Double Membrane-bound Organelles:

Mitochondria: Powerhouse of the cell, generating ATP. (Draw and label cristae and matrix).

Chloroplast: Site of photosynthesis in plant cells. (Draw and label thylakoid, stroma).

(b) Mesosome in Prokaryotic Cells:

A mesosome is a folded invagination of the plasma membrane in prokaryotic cells, involved in cellular processes like respiration and DNA replication.