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Half yearly examination 2024-25

Class XI.
Maximum Mark - 70

Subject- Biology (044)
Time - 3:0 hrs

SECTION A - Multiple Choice Questions (1MARK)

Q1. A group of plants and animals with similar traits of any rank is (1M)

- a. Taxon b. Species c. Genus d. Order

Q2. 7. Binomial nomenclature was given by

- a. Linnaeus b. Hugo De Vries c. John Ray d. Huxley

Q3. What is the main basis of classification in the five-kingdom system? (1M)

- a. Structure of the nucleus c. Structure of cell wall
b. Asexual Reproduction d. Mode of Nutrition

Q4. Which of the following statements is false about the fungi? (1M)

- a. They are eukaryotes b. They possess a purely cellulosic cell wall
b. They are heterotrophs d. They are non - chlorophyllous

Q5. Plant that has seeds but no flowers and fruits? (1M)

- a. Bryophytes c. Gymnosperms
b. Mosses d. Pteridophytes

Q6. The morphological nature of the edible part of a coconut is. (1M)

- a. Cotyledon b. Perisperm
b. Pericarp d. Endosperm

Q7. Casparian strips occur in (1M)

- a. Cortex c. Epidermis
b. Endodermis d. Pericycle

Q 8. Phloem in gymnosperms lacks (1M)

- a) Sieve tubes only C. Albuminous cells and sieve cells
b) Companion cells only d. Both sieve tubes and companion cells

Q9 . Which membrane protects the eyes of frog in water? (1M)

- (a) Tympanum b) Sebaceous
(b) Skin D) Nictitating

Q10 . The main function of the skin of frog is (1M)

- (a) the exchange of respiratory gases C) the storage of energy
(b) the storage of fat d) to convert light vitamin D

Q11. Mitochondria and chloroplast are considered to be endosymbionts of cell because they: (1M)

- (a) Possess their own nucleic acid (c) Do not reproduce
(b) Have capacity of ATP synthesis (d) All the above

Q12. Which one is not a difference between Prokaryotic and Eukaryotic cell? (1M)

- (a) Presence of membrane bounded organelles
(b) Number of chromosomes
(c) Presence of nuclear membrane
(d) Presence of cell wall

Q13. Nitrogenous bases present in DNA (1M)

- (a) Adenine, guanine, cytosine, uracil
(b) Adenine, guanine, cytosine, thymine

- (c) Adenine, thymine, uracil
- (d) Guanine, uracil

Q14. Which one of the following pairs of nitrogenous bases of nucleic acids is wrongly matched with the category mentioned against it? (1M)

- (a) Adenine, Thymine – Purines
- (b) Uracil, Cytosine – Pyrimidines
- (c) Guanine, Adenine – Purines
- (d) Thymine, Uracil – Pyrimidines

Q15. Crossing over results the exchange of genetic material, which occurs between (1M)

- (a) Non-sister chromosomes
- (b) Sister chromatids
- (c) Non-homologous chromosome
- (d) Homologous chromosomes

Q16 . In cell cycle, DNA replication takes place in (1M)

- (a) G1 phase
- (b) G2 phase
- (c) Mitotic metaphase
- (d) S phase

Q17 The metabolic pathway which produces carbohydrate is (1M)

- (a) Calvin cycle
- (b) Glycolysis
- (c) Cyclic electron pathway
- (d) Krebs cycle

Q18 . The organism that completely lack a cell wall and are smallest living cell know, can survive without oxygen is (1M)

- (a) Bacteriophages
- (b) Yeast
- (c) Mycoplasmas
- (d) Virus

SECTION B – Short answer type questions and answers 2mark

Q19) Draw the labelled diagram of the following: (i) Dicot seed (ii) V.S. of monocot seed. (2M)

Q20). What are the three types of meristematic tissues? (2M)

Q21 Differentiate between nucleotides & nucleosides?. (2M)

Q22. Describe the events taking place during interphase. (2M)

Section C - Long answer type questions 3mark

Q23. List the main differences between mitosis and meiosis. (3M)

Q24. Differentiate between cofactors, coenzymes & prosthetic groups. (3M)

Q25. Difference between Dicot Root and Monocot Root? (3M)

Q26. Draw the neat and well labelled diagram of the Male reproductive system of a frog. (3M)

Q27 . Give a comparison between Cyclic and non-cyclic photophosphorylation. (3M)

Q 28. What is the difference between direct and indirect development?(3M)

Q29 Both gymnosperms and angiosperms bear seeds, then why are they classified separately? (3M)

Section D - Long answer type questions 5 mark

Q30 What are the modifications that are observed in birds that help them fly?(5M)

Q31. Define the following terms: (2.5 +2.5= 5M)

(a) aestivation

(b) placentation

Q32. List out the main differences between plant cell and animal cell. (5M)

SECTION E CASE STUDY / PASSAGE BASED QUESTION

(4MARK)

Case Study 1 (4M)

The splitting of water is associated with the PS II; water is split into $2H^+$, $[O]$ and electrons. This creates oxygen, one of the net products of photosynthesis. The electrons needed to replace those removed from photosystem I are provided by photosystem II. Water splitting complex is associated with the PS II, which itself is physically located on the inner side of the membrane of the thylakoid.

Living organisms have the capability of extracting energy from oxidisable substances and store this in the form of bond energy. Special substances like ATP, carry this energy in their chemical bonds. The process through which ATP is synthesised by cells (in mitochondria and chloroplasts) is named phosphorylation. Photo-phosphorylation is the synthesis of ATP from ADP and inorganic phosphate in the presence of light. When the two photosystems work in a series, first PS II and then the PS I, a process called non-cyclic photo-phosphorylation occurs. The two photosystems are connected through an electron transport chain. Both ATP and $NADPH + H^+$ are synthesised by this kind of electron flow.

1.) Photolysis of water or splitting of water molecule takes place in _____ (1M)

- a) Photosystem PS I
- b) Photosystem PS II
- c) Photosystem PS III
- d) Both PS I and PS II

2.) Water molecule splits into _____ in presence of light. (1M)

- a) Hydrogen, Nitrogen and Electrons
- b) Hydrogen, Oxygen and Protons
- c) Hydrogen, Oxygen and Neutrons
- d) Hydrogen, Oxygen and Electrons

3.) By which mechanism two photosystem can be connected and work in series?. (1M)

4.) Define phosphorylation and Photo-phosphorylation. (1M)

Case Study 2 (4M)

Algae are chlorophyll-bearing, simple, thalloid, autotrophic and largely aquatic (both fresh water and marine) organisms. They occur in a variety of other habitats: moist stones, soils and wood. Some of them also occur in association with fungi (lichen) and animals (e.g., on sloth bear). The form and size of algae is highly variable, ranging from colonial forms like Volvox and the filamentous forms like Ulothrix and Spirogyra.

The algae reproduce by vegetative, asexual and sexual methods. Vegetative reproduction is by fragmentation. Asexual reproduction is by the production of different types of spores, the most common being the zoospores. Sexual reproduction takes place through fusion of two gametes. The algae are divided into three main classes: Chlorophyceae, Phaeophyceae and Rhodophyceae.

The members of chlorophyceae are commonly called green algae. The plant body may be unicellular, colonial or filamentous. They are usually grass green due to the dominance of pigments chlorophyll a and b. The chloroplasts may be discoid, plate-like, reticulate, cup-shaped, spiral or ribbon-shaped in different species. Most of the members have one or more storage bodies called pyrenoids located in the chloroplasts. Green algae usually have a rigid cell wall made of an inner layer of cellulose and an outer layer of pectose. Vegetative reproduction usually takes place by fragmentation or by formation of different types of spores. Asexual reproduction is by flagellated zoospores produced in zoosporangia. The sexual reproduction shows considerable variation in the type and formation of sex cells and it may be isogamous, anisogamous or oogamous. Some commonly found green algae are: Chlamydomonas, Volvox, Ulothrix, Spirogyra and Chara. The members of phaeophyceae or brown algae are found primarily in marine habitats. They show great variation in size and form. They possess chlorophyll a, c, carotenoids and xanthophylls. They vary in colour from olive green to various shades of brown depending upon the amount of the xanthophyll pigment,

fucoxanthin present in them. Food is stored as complex carbohydrates, which may be in the form of laminarin or mannitol. The vegetative cells have a cellulosic wall usually covered on the outside by a gelatinous coating of algin. Vegetative reproduction takes place by fragmentation. Asexual reproduction in most brown algae is by biflagellate zoospores that are pear-shaped and have two unequal laterally attached flagella. Sexual reproduction may be isogamous, anisogamous or oogamous. The common forms are Ectocarpus, Dictyota, Laminaria, Sargassum and Fucus.

- 1) _____ is the colonial form of algae. (1M)
a) Ulothrix c) Volvox
b) Spirogyra d) Chara
- 2) _____ are a micro compartment storage bodies located in the chloroplasts of algae.
a) Algin c) Carragen
b) Pyrenoids d) Mannitol
- 3.) Name the animal which shows mutual association with algae. (1M)
- 4) Give reason – Why members of chlorophyceae class are named as green algae? (1M)