

MISSION M.B.B.S

Date: 19/08/2022

Subject: BOTANY

Topic : PLANT KINGDOM L1

Class: Standard XI

Instructions:

A

1. Choose the correct statements:

- I. All organisms belonging to Kingdom plantae are eukaryotic
- II. Mosses are grouped under Pteridophytes
- III. All organisms belonging to Kingdom Plantae have well differentiated shoots, roots and leaves.

- ☒ A. Only I
- ☐ B. Only II
- ☐ C. Only II and III
- ☐ D. Only I and III

Eukaryotic, photosynthetic organisms belong to Kingdom plantae. Hence statement I is correct.

Mosses are grouped under Bryophytes. Hence statement II is incorrect.

Some groups of organisms such as algae and bryophytes have a thalloid plant body which is not differentiated into true roots, stems and leaves while plants belonging to pteridophytes, gymnosperms and angiosperms are well differentiated into roots, stems and leaves. Hence statement III is incorrect.

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2. The pigment that imparts green colour to plants is known as

- ☐ A. chloroplast
- ☐ B. chloroglobin
- ☐ C. hemoglobin
- ☒ D. chlorophyll

The green coloured pigment in plants is known as chlorophyll. Chlorophyll is found in chloroplast, a plant organelle. It is used for capturing solar energy and converting it into chemical energy for synthesis of food in plants. This process is known as photosynthesis.

Hemoglobin is found in the red blood cells of human beings for carrying oxygen in the blood. There is no pigment named chloroglobin.

3. Plants utilise X and produce Y. Identify X and Y.

- ☐ A. X - oxygen, Y - glucose
- ☒ B. X - sunlight, Y - glucose
- ☐ C. X - chlorophyll, Y - water
- ☐ D. X - sunlight, Y - water

All green plants perform photosynthesis. During this process, the pigment chlorophyll in plants utilise solar energy to convert carbon dioxide to glucose. Water is broken down in the process to release oxygen.

Glucose is oxidised by plants during cellular respiration to produce energy which is utilised to carry out all the metabolic processes in the cell.

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4. Which of the following are characteristic features of organisms belonging to the plant kingdom

- I. Lack a well-defined nuclei
- II. Possess cell walls composed of chitin
- III. Can manufacture their own food
- IV. Use oxygen for energy production

- ☒ A. Only I and II
- ☒ B. Only II and III
- ☒ C. Only III and IV
- ☒ D. Only I and IV

Organisms belonging to Kingdom Plantae are eukaryotic and possess a well-defined nucleus covered by a nuclear membrane. Hence statement I is incorrect.

Plant cells are bound by a cell wall primarily composed of cellulose. Chitin is found in the cell walls of fungi. Hence statement II is incorrect.

All green plants have the ability to synthesise their own food by the process of photosynthesis. Hence statement III is correct.

All plants use oxygen to breakdown food to produce energy for required for cellular processes. This process is called aerobic respiration and takes place in the mitochondria of the cell. Hence statement IV is correct.

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5. Choose the option with correct statements about the reason for further classification of Kingdom Plantae:
- I. Convenient to place new organisms
 - II. Categorization allows ease in categorizing newly discovered organisms
 - III. Sort the huge diversity of organisms
 - IV. A dump of organisms looks ugly and classification is presentable

- ☐ A. Only I
- ☐ B. Only II and III
- ☐ C. Only I and IV
- ☒ D. Only I, II and III

Kingdom Plantae is further classified into five divisions - Algae, bryophyta, pteridophyta, gymnosperms and angiosperms.

This classification is done to categorize about 3,74,000 plant species into divisions so that species sharing common features can be placed in a category.

This segregation allows studying of the organisms easier. Also, the new organisms that are discovered can be placed based on the common features of a division. This would allow the scientists to predict other features of the newly discovered organisms.

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6. Linnaeus placed bacteria, fungi along with plants in Kingdom Plantae. The character that unified these diverse groups is the

- ☐ A. presence of cell membrane
- ☒ B. presence of cell wall
- ☐ C. similar mode of nutrition
- ☐ D. similar mode of reproduction by spores

One of the main characters that Linnaeus considered during classification was the presence or absence of a cell wall. Bacteria and fungi were placed along with plants because of the presence of cell walls.

Cell membrane is present in bacteria, fungi and plants.

Plants have an autotrophic mode of nutrition.

Bacteria and fungi have heterotrophic modes of nutrition.

Bacteria, fungi and plants produce spores but the mode of production of spores is different. Plants, like algae, produce zoospores during asexual reproduction. Bacteria produce endospores during unfavourable conditions. Fungi produce spores during both sexual and asexual reproduction.

7. The stored food material of *Laminaria* is

- ☐ A. floridean starch
- ☐ B. glycogen
- ☒ C. laminarin
- ☐ D. both b and c

Laminaria is a member of the class Phaeophyceae. It is a brown alga. The stored food in brown algae is laminarin or mannitol.

Glycogen is the stored food material in animals.

Floridean starch is the stored food material in red algae or the members of Rhodophyceae.

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8. Which of the following belong to the same group?

- ☒ A. *Ectocarpus, Chlorella, Gracilaria*
- ☒ B. *Porphyra, Gelidium, Chara*
- ☒ C. *Ectocarpus, Dictyota, Fucus*
- ☒ D. *Laminaria, Fucus, Volvox*

Red algae:- *Gracilaria, Porphyra, Gelidium*

Brown algae:- *Ectocarpus, Dictyota, Fucus, Laminaria*

Green algae:- *Chlorella, Volvox, Chara*

9. Which of the following undergoes meiosis in algae?

- ☒ A. Zoospore
- ☒ B. Zygote
- ☒ C. Aplanospore
- ☒ D. Algae never undergo meiosis as they are haploid

Zygote undergoes meiosis to produce a haploid plant body. This is a feature of the haplontic life cycle.

Zoospores are motile spores and aplanospores are nonmotile spores produced due to mitosis in algae.

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10. Commercially used carrageenan comes from algae

- ☐ A. that store food as mannitol
- ☒ B. that have phycoerythrin pigment
- ☐ C. that store starch in pyrenoids
- ☐ D. that have fucoxanthin pigment

Commercially used carrageenan comes from *Chondrus*, which is a red alga. Phycoerythrin, the pigment for red colour, is a characteristic of all red algae. Pyrenoids are storage bodies in the chloroplasts of green algae. Mannitol is the stored form of food in brown algae. Fucoxanthin is the pigment responsible for their brown colour.