IFS Botany Papers 2005

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Paper-I

Section A

1. Answer any four of the following (Answer should not exceed 150 words in each case) : (4 × 10 = 40)
    a. Differentiate between the following (Give examples and diagrams wherever necessary)
        i. Zoospore and compound zoospore.
        ii. Obligate and facultative parasites.
        iii. Ascospore and auxospore.
        iv. Archegonium and carpogonium.
    b. Write short notes on:
        i. Heterocyst in blue green algae
        ii. Interferon.
        iii. Plurilocular sporangia in Ectocarpus.
        iv. Heteromorphic life cycle in Phaeophyceae (Give a diagrammatic sketch) .
    c. Write short notes on:
        i. Thallus of Penicillium.
        ii. Thallus structure of Saprolegnia.
        iii. Alternation of generations in slime molds (Pictorial presentation of life cycle)
        iv. Cleistothecium in Erysiphe.

d. Answer the following:
   i. Gametophytic phase in Laminaria.
   ii. Municipal waste treatment by anaerobic and aerobic microorganisms.
   iii. L S of sporocarp of Marsilea (Labelled diagram only)
   iv. Cultivation of edible mushroom (Volvariella sps.) steps leading to sprouting of basidiocarp.

e. Write notes on
   i. Control of viral diseases of plants.
   ii. Economic importance of Diatomaceous earth.
   iii. T S of Equisetum stem (Diagram only) .
   iv. Nucule of Chara.

2. Answer the following questions
   a. With the help of labelled diagrams only, show the evolutionary trend in the steles of Pteridophyta (20) .
   b. Write an account of the importance of bacteria in soil fertility (20) .

3. Answer the following questions
   a. Discuss the morphological nature of the rhizophore of Selaginella. Draw a neat labelled diagram of T S of rhizophore.
   b. With-the help of diagrams, describe the structure of Marchantia antheridiophore (20) .

4. Draw neat labelled diagrams of the following: (4 × 10 = 40)
   a. Anatomy of Equisetum cone.
   b. Cross-section of the gametophytic thallus of Riccia.
   c. Life cycle of Ectocarpus (Pictorial presentation only) .
   d. Structure of prothallus of Adiantum.

Section B

1. Answer any four of the following. The answer should not exceed 150 words in each case: (4 × 10 = 40)
   a. Mention the important work done by the following botanists:
      i. Prof. S. R. Kashyap
      ii. Prof. F. E. Fritsch
      iii. Prof. P. Maheshwari
      iv. Prof. Birbal Sahni.
   b. Give F. F. And F. D. Of the following families:
      i. Euphorbiaceae
      ii. Asteraceae (Compositae)

iii. Liliaceae

iv. Rubiaceae.

c. Write short notes on

i. Preservation of plant specimens.

ii. Functions of endosperm.

iii. Experimental induction of polyembryony.

iv. Causes and significance of apomixis.

d. Draw labelled diagrams of the following:

i. L S Pinus female cone.

ii. Stem anatomy of Gnetum.

iii. T S normal root of Cycas.

iv. T S young root of Ginkgo biloba.

e. Answer the following

i. Draw a neat labelled diagram of a typical organised embryo sac.

ii. T S of Ephedra leaf.

iii. Application of protoplast culture.

iv. Economic importance of plants belonging to family Umbelliferae.

2. Describe the type of anomalous secondary growth found in the stems of the following (Draw neat labelled diagrams) :

a. Aristolochia (10)

b. Bignonia (10)

c. Boerhaavia (10)

d. Dracaena (10)

3. Answer the following:

a. Discuss the scope of Palynology (10) .

b. Explain Tunic a-corpus theory relating to structural development and differentiation of shoot apex (10) .

c. Draw a diagram of T S of leaf of Typha (10) .

d. Write an account of drug yielding plants (10) .

4. Answer the following questions

a. Describe the principles governing the construction of mechanical system in plants.

b. Give the botanical name, family and plant parts used in the following:

i. Henna

ii. Penicillin

iii. Ginger

iv. Chestnut
v. Indian bow string hemp
vi. Camphor
vii. Clove oil
viii. Sassafras
ix. Mulberry
x. Date Palm (20 × 2 = 40) .

Paper-II

Section A

1. Write short notes on any four of the following in about 150 words each (5 × 10 = 50)
   a. Nucleosome
   b. Male sterility
   c. Chi-square test
   d. Trisomics
   e. One-gene, one-enzyme concept
2. Answer the following questions
   a. Explain the various methods of transfer of genes (20) .
   b. What is recombinant DNA technology? How is it employed in genetic engineering (20) ?
3. Answer the following questions
   a. With suitable classical experiments on sex-linked inheritance, prove that genes are carried on the chromosomes (30) .
   b. How is sex determined in plants (10) ?
4. Answer the following questions
   a. Explain the regulatory mechanism of gene action in microbes (20) .
   b. What is genetic code? Explain the mechanism of genetic code in the transfer of information from DNA to amino acids (20) .

Section B

1. Write short notes on any four of the following in about 150 words each: (5 × 10 = 50)
   a. CAM Pathway
   b. Phytochrome
   c. Gibberellins
   d. Bioindicators
   e. Red Data Books

2. Answer the following questions
    a. Describe the morphological and biochemical changes accompanying seed germination (20) .
    b. Explain the molecular basis of fruit ripening and show how fruit ripening is manipulated (20) .
3. Answer the following questions
    a. Explain the physiology of nitrogen metabolism (20) .
    b. Explain the mechanism of photorespiration in plants (20) .
4. Answer the following questions
    a. Explain the characteristics of various forest types of India (30) .
    b. Explain forests as renewable resources (10) .