IAS Mains Botany Papers 1997

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Paper-I

Section A

1. Answer any three of the following in not more than 200 words each
    a. Describe the characters which indicate that blue-green algae are primitive and ancient members of plant kingdom.
    b. What is retrogressive origin of Saprophytes in Bryophytes?
    c. Describe the various types of fruiting bodies in Ascomycetes.
    d. Describe the reproductive structure in Ectocarpus.

2. Give a concise account of the life cycle of the causal organism, snptoms and control measures of any four of the following diseases
    a. Root knot disease of tomato
    b. Late blight of potato
    c. Leaf curl disease of papaya
    d. Red rot of sugarcane
    e. White wart of cucurbits

3. Answer the following questions
    a. Describe different types of vascular steles in Lycopodium.
    b. Describe sexual reproduction in Oedogonium.
    c. Give structure of a bacterial cell.
    d. Describe the leaf structure of Polytrichum.

4. Answer the following questions
    a. Describe the structure of psilotum.
    b. Describe Puri and Garg's theory of morphological nature of Marsilea sporocarp.
    c. Write short notes on
        i. Gemma Cup
        ii. Endothecium
        iii. Carposporphyte
        iv. Apothecium

Section B

1. Answer any three of the following in not more than 200 words each
    a. Enumerate the primitive and advanced characters of flowers.
    b. Give an account of the pollen morphological characters.
    c. Describe the structure of the flower of Liliaceae.
    d. Describe variations in placentation in Thalamiflorae.
2. Compare the following sets
    a. Microsporophyll of Cycas and Pinus
    b. Inflorescence in Ficus and Morus
    c. Dorsiventral and Isobilateral leaf
    d. Glandular and Amoeboid tapetum
3. Answer the following questions
    a. Describe the ovule structure at the time of pollination in Gnetum.
    b. Give an account of the organization of shoot apical meristem.
    c. Describe the importance of a Herbarium. Mention two major Herbaria of India.
4. Answer the following questions
    a. What are somatic hybrids? How are they produced? Discuss the significance of these hybrids.
    b. Describe the floral structure of Rosaceous giving floral diagram and floral formula.

c. Write short notes on the following:

i. ICBN

ii. Apomixis

iii. Totipotency

iv. Heterostyly

v. Cltrastructure of egg apparatus

Paper-II

Section A

1. Answer any three of the following. Each part should be answered in not more than 200 words:

    a. What is the role of Golgi complex in a cell? Describe how Golgi complex is structurally and functionally interconnected with endosplasmic reticulum.

    b. Why was Mendel fortunate in his choice of the pea plant as the experimental material? Why are Mendel's laws important?

    c. The C3 cycle and C4 cycle are temporally separated in CAM plants, whereas they are spatially separated in C4 plants. Explain.

    d. Give the botanical name, family, cultivation and processing of any beverage plant you have studied.

2. Discuss the operon concept of gene action.

3. Answer the following questions

    a. Write an account of polyploidy and its role in evolution.

    b. Discuss the chemical organization of a chromosome:

4. Answer the following questions

    a. Write short notes on any four of the following:

        i. Chemical mutagens

        ii. Downs syndrome

        iii. Seed dormancy

        iv. Active and passive uptake of ions

        v. Shifting cultivation

b. Forests are an important natural resource and need to be conserved. Discuss.

Section B

1. Answer any three of the following. Each part should be answered in not more than 200 words:
    a. Write a short account of photoperiodism in plants.
    b. Discuss the dynamics of translocation of organic substances.
    c. Name the vaznous phytogeographical zones of India and give two examples of characteristic plants from each region.
    d. How is the centre of origin of cultivated plants determined? Discuss the importance of such a study in relation to improvement of crop plants.
2. Describe the process of rhizobial infection and nodule development in a legume root. What is the function of leghaemoglobin in symbiotic nitrogen fixation?
3. Answer the following questions
    a. Define succession and explain with the help of a suitable example.
    b. Write a note on ecosystem under the following heads.
        i. Components
        ii. Energy flow
        iii. Nutrient movement
4. Answer the following questions
    a. Mention any three timber-yielding plants of India. Give the botanical names, their respective families and distribution. Add a note on seasoning of wood
    b. With suitable example enumerate the chief characteristics and importance of the following
        i. Essential oils
        ii. Fatty oils