B.Sc. 5th Semester (Honours) Examination, 2023 (CBCS)

Subject : Botany

Course : DSE-1

(Techniques in Plant Sciences)

Time : 2 Hours **Full Marks : 40**

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

1. Answer *any five* from the following: 2×5=10

   (a) Explain the purpose of using immersion oil in light microscopy.

   (b) What is shadow casting in electron microscopy?

   (c) Mention the advantages of Cryofixation.

   (d) Cite one application of HPLC.

   (e) What is the role of a condenser in a light microscope?

   (f) What is the primary purpose of SDS-PAGE in protein characterization?

   (g) What is the purpose of a reference solution in a spectrophotometric measurement?

   (h) Point out the role of stationary phase in column chromatography.

2. Answer *any two* from the following: 5×2=10

   (a) Describe the principle of Ion-exchange chromatography. Mention the limitations of this technique. 3+2

   (b) Define and differentiate between a sample and population. Discuss the advantages and disadvantages of using samples in statistical analysis. 2+3

   (c) Outline the process of freeze etching technique. Mention the advantages of freeze etching in structural analysis. 3+2

   (d) Write a short note on applications of density gradient in ultra-centrifugation.

3. Answer *any two* from the following: 10×2=20

   (a) Compare AGE, PAGE and SDS-PAGE in terms of their applications, resolving power and the types of molecules they are best suited to separate. Explain the principles of SDS-PAGE. 6+4

   (b) Describe the fundamental principles of HPLC. Point out the components of HPLC. 6+4

   (c) Discuss the role of flow cytometry in cell sorting and isolation. Outline with a flow diagram how a flow cytometer operates. 5+5

   (d) What is Standard Deviation? Why is it called "root means squared deviation"? Find the standard deviation for the following distribution :

   11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21. 2+2+6

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B.Sc. 5th Semester (Honours) Examination, 2023 (CBCS)

Subject : Botany

Course : DSE-1(OR)

(Reproductive Biology of Angiosperms)

Time : 2 Hours   **Full Marks : 40**

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words
as far as applicable.

1. Answer *any five* from the following: 2×5=10

   (a) Differentiate between monosporic and tetrasporic megasporogenesis.

   (b) What do you mean by Melissopalynology?

   (c) Does Apomixis require fertilization and pollination? Give reasons in support of your answer.
   1+1

   (d) How do aquatic plants undergo pollination?

   (e) What is triple fusion? Name the nuclei involved in triple fusion.
   1+1

   (f) Draw and describe about Amoeboid tapetum.

   (g) Define self-incompatibility. How do self-incompatible plants pollinate?
   1+1

   (h) What is NPC system?

2. Answer *any two* from the following: 5×2=10

   (a) Describe the development of a female gametophyte in angiosperms.

   (b) Elucidate the characteristics of wind, water and insect-pollinated flowers.

   (c) Give a brief idea on Intra-ovarian and in-vitro pollination.

   (d) What are the major events occur on the stigma surface after pollination?

3. Answer *any two* from the following: 10×2=20

   (a) What is Apomixis? Discuss the applications of Apomixis in plant breeding.
   2+8

   (b) What do you understand by a bisporic embryo-sac? Draw and describe the organization and ultrastructure of a typical mature embryo-sac.
   2+8

   (c) Give an account of structure and nature of endosperm in angiosperms.
   10

   (d) Explain the process of microsporogenesis in angiosperms with suitable diagram.
   10

B.Sc. 5th Semester (Honours) Examination, 2023 (CBCS)

Subject : Botany

Course : DSE-1(OR)

(Silviculture and Forest Management)

Time : 2 Hours   **Full Marks : 40**

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as applicable.*

1. Answer *any five* from the following: 2×5=10

   (a) Define autecology and synecology.

   (b) What is litter-fall?

   (c) Name two medicinally important trees with their families.

   (d) Distinguish between major and minor forest products.

   (e) What do you mean by phyto-remediation?

   (f) Define vegetative mapping.

   (g) What is production ecology?

   (h) What are herbivores? Cite one example.   1+1

2. Answer *any two* from the following: 5×2=10

   (a) Describe the role of green manuring and vermicompost in agro forestry.

   (b) Define social forestry. Mention the major implications of social forestry in environment and economic development.   1+4

   (c) Briefly describe on Man-wildlife conflict studies.

   (d) Describe the major steps of tree improvement programme.

3. Answer *any two* from the following: 10×2=20

   (a) Define pollination. Describe the role of animals in pollination and seed dispersal.   2+8

   (b) What is phenology? Describe the different types of trees on the basis of wood properties. 2+8

   (c) What are the major plant derived insecticides? Mention the major role of defense in chemical and biological means.   2+4+4

   (d) What do you understand by National forest policies? Describe the types of forest with suitable examples.   2+8

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