

Total Pages —6

I-UG-C1-Maj—BOT-II

2025

BOTANY

Full Marks : 100

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

SECTION — A

1. Answer the following : 1 × 10

(a) _____ is a molecule that absorbs light and then re-emit it as a different colour.

(b) The first electron microscope was discovered by _____.

(c) _____ process is used to Fractionate sub-cellular organelles.

(Turn Over)

(2)

- (d) Sedimentation co-efficient is expressed in _____ unit.
- (e) The substance fixed in place for the chromatography procedure is called _____.
- (f) _____ is an anionic detergent used in electrophoresis.
- (g) IR spectrophotometer uses the light wave-length range _____.
- (h) The maximum rpm of a standard ultra-centrifuge is _____.
- (i) In a bomb calorimeter, the sample is burnt in the presence of _____ gas.
- (j) Full form of AGE is _____.

(3)

SECTION – B

2. Answer the following questions : 2×9

- (a) What is negative staining?
- (b) What is Cryofixation?
- (c) What is microscopy? What are the functions of Microscope?
- (d) Write the principle of TEM.
- (e) What is rotor in centrifugation? How it works?
- (f) What is cell fractionation?
- (g) Write application of PAGE.
- (h) State role of SDS in SDS-PAGE.

(4)

- (i) Give functions of UV-Visible spectroscopy.

SECTION - C

3. Write notes on any *eight* of the following :
5 × 8

- (a) Shadow casting
- (b) Explain pulse chase experiment
- (c) Write notes on HPLC
- (d) Flow cytometry
- (e) Paper chromatography
- (f) Auto-radiography
- (g) Fluorescence spectroscopy
- (h) X-ray diffraction

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(Continued)

(5)

- (i) Flame photometer

- (j) Affinity chromatography.

SECTION - D

4. Answer any *four* of the following : 8 × 4

- (a) Give an account of Scanning Electron microscope and its application.
- (b) Explain the working principle of a fluorescence microscope.
- (c) Write an essay on density gradient centrifugation.
- (d) Describe ion-exchange chromatography.

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(Turn Over)

(e) Explain the principle on working mechanism of UV-visible spectroscopy.

2024

Full Marks - 100

Time - 3 hours

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Answer *all* questions

Part-I

1. Answer the following : 1 × 10

a) Which part of compound microscope helps in gathering and focusing light rays on the specimen to be viewed ?

- i) Eye piece lens
- ii) Objective lens
- iii) Condenser lens
- ii) Magnifying lens.

b) The Resolving power of Human eye is _____.

c) One Svedberg's Unit (s) is equal to _____.

d) Catalase is the marker enzyme of _____.

e) The positively charged beta particles are known as _____.

[2]

- f) In a spectrophotometer, the desired wavelength of light is selected by a component called _____.
- g) Ninhydrin is used to detect _____ in the paper Chromatography.
- h) SDS-PAGE expands on _____.
- i) Agarose is a polymer of _____ monosaccharide.
- j) Electrophoresis was invented by _____.

Part-II

2. Answer the following : 2 × 9

- a) What is magnifying power of a Microscope ?
- b) What is Critical Point Drying ?
- c) Write the components of SEM.
- d) Write the Factors affecting Sedimentation.
- e) What is the half-life of a Radioactive isotope ?
- f) Write two advantages of Fluorescence spectroscopy.
- g) What is optical density ?

[3]

- h) Write the applications of HPLC.
- i) What do you mean by stationary phase and mobile phase ?

Part-III

3. Write notes on any *eight* of the following : 5 × 8

- a) Resolution power of Microscope
- b) Ultracentrifugation
- c) CsCl_2 gradient
- d) Pulse-chase experiment
- e) Beer-Lambert's law.
- f) Principle of IR Spectroscopy
- g) Ion exchange chromatography
- h) X-ray crystallography
- i) Applications of Autoradiography
- j) PAGE.

Part-IV

4. Answer any *four* of the following : 8×4

- a) Give an account of Scanning elaborate Microscope. (SEM)
- b) What is flow cytometry ? Give an example account of it.
- c) Describe the principles and applications of Spectrophotometry.
- d) Give an account of Paper Chromatography with its applications.
- e) Describe the Agarose Gel Electrophoresis (AGE) with its advantages.