

U.G. 5th Semester Examination-2021

BOTANY

[HONOURS]

Discipline Specific Elective (DSE)

Course Code : BOT-H-DSE-T-01

(Analytical Techniques in Plant Science)

Full Marks : 40

Time : 2½ Hours

The figures in the right-hand margin indicate marks.

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

1. Answer any **five** of the following: 2×5=10
- Define transmittance and absorbance.
 - Name the different types of spectrophotometers.
 - What do you mean by stationary phase?
 - State the principle of gel electrophoresis.
 - What is freeze itching?
 - Which of the following are considered to be the lowest form of Electromagnetic radiation and why?
(i) IR radiation (ii) Micro waves (iii) Radio waves

- Write down the full form of HPLC and NMR.
- Scanning electron microscopy (SEM) is used to study the internal structure of cells and transmission electron microscopy (TEM) is used to study surface structure of cell. Is this statement true or false? Justify your answer.

2. Answer any **two** of the following : 5×2=10
- Define chemical shift. How is it useful in NMR spectroscopy? 2+3=5
 - Give a schematic diagram of HPLC. 5
 - What do you mean by marker enzyme? How it is used in centrifugation? 2+3=5
 - State the differences between agarose gel electrophoresis and polyacrylamide gel electrophoresis. 5
 - Define mean deviation and standard deviation. How these two are different? 3+2=5
3. Answer any **two** of the following questions : 10×2=20
- Write in details the process of sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE) technique. 10
 - What do you mean by null hypothesis and alternate hypothesis? Write down the formula of chi-

squared test. How degree of freedom is calculated in case of chi-squared test? Define P value.

$$3+3+2+2=10$$

c) Explain how fluorescence microscopy is used in the study of Chromosome banding. Write in details the sample preparation for scanning electron microscopy.

$$2+8=10$$

d) How thin layer chromatography (TLC) differs from gas liquid chromatography (GLC)? Write down the uses, merits and demerits of ion-exchange chromatography, affinity chromatography.

$$4+6=10$$
