

U.G. 6th Semester Examination - 2021**BOTANY****Course Code : BBOTDSHC5****Course Title : Analytical Techniques in Plant Sciences**

Full Marks : 30

Time : 2 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 **ten** questions from the following:

1×10=10

- a) Define fluorochromes.
- b) What is cryofixation?
- c) Name one negative stain used in bacterial staining.
- d) Name one dye used to stain chromosomes.
- e) What do you mean by vital stain?
- f) Name the technique used for the detection of 3D-structure of proteins.

- g) What is G-banding?
- h) Which spectroscopic analysis is associated with the molecular emission?
- i) What is negative staining?
- j) What is null hypothesis?
- k) What do you mean by isopycnic centrifugation?
- l) What do you mean by retention time in the context of chromatography?
- m) Mention the technique used to study the surface topology of a specimen in detail.
- n) Mention two applications of autoradiography.
- o) Name one marker enzyme for the plasma membrane.

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

- a) Explain why pulse-chase experiment is important in biology?
- b) Why are fixatives used during sample preparation for microscopy?
- c) Explain why DNA moves towards the positive electrode in agarose gel electrophoresis?

- d) Differentiate magnification from resolution.
- e) What do you mean by quantum dots?
- f) Distinguish between fluorescence and confocal microscopy.
- g) Why SDS is used in protein gel?
- h) How freeze-fracture method differs from freeze-etching method?

3. Answer any **two** from the following: $5 \times 2 = 10$

a) Using a ray diagram, explain the working of a transmission electron microscope. Write a brief account on the application of this technique. $3+2$

b) The heights (in cm) of ten maize plants are given below:

120, 150, 130, 120, 140, 145, 135, 120, 150 and 140.

Calculate the mean, the median, the mode, the variance and the standard deviation using the given data.

c) What is a probe? How are probes used in FISH? $2+3$
