

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5565

J

Unique Paper Code : 2162013603

Name of the Paper : Advanced Tools and Analytical Techniques in Plant Biology

Name of the Course : **B. Sc. (Hons) Botany**

Semester : VI

Duration : 2 Hours

Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt four questions in all.
3. Question No. 1 is compulsory.
4. All questions carry equal marks

1. (a) Write the role of **(any five)**: (5)

(i) Bis-acrylamide in PAGE

(ii) Monochromator

(iii) Immersion oil

(iv) Electron gun

P.T.O.

(v) Osmium tetroxide

(vi) Primer

(b) True or false (**any five**): (5)

(i) Separation of molecules in paper chromatography is based on liquid-liquid partitioning.

(ii) SEM require higher electric power (voltage) than TEM.

(iii) In isopycnic centrifugation the maximum density in the gradient exceeds the density of the particles to be separated.

(iv) Western blotting is used for the separation and analysis of RNA.

(v) Both, *Taq* and *Pfu* DNA polymerase are thermostable.

(vi) G-banding shows darker bands at G/C rich region of the chromosome.

(c) Match the following: (5)

(i) Spectrophotometer

(a) Tswett

(ii) Electron Microscope

(b) Edwin

(iii) Chromatography

(c) Knoll and Ruska

(iv) Ultracentrifugation

(d) Beer and Lambert

(v) Southern blotting

(e) Svedberg

2. Discuss the following **(any three)**: (3x5= 15)

- (a) Selection of cuvette during Visible, UV and IR spectrophotometry.
- (b) How and why temperature, pH and osmotic potential are regulated during tissue homogenization?
- (c) What is centrifugation force? Discuss the factors on which it depends.
- (d) FISH Technique and its application.

3. Discuss the following **(any three)**: (3x5= 15)

- (a) Discuss the importance and limitations of freeze fracture technique.
- (b) What is negative staining? Give an example.
- (c) Selection of sucrose or caesium chloride as density gradient medium.
- (d) Discuss the key steps involve in PCR Technique

4. (a) With the help of suitable diagram briefly discuss the principle, functioning and applications of Column chromatography. (10)

- (b) What are radioisotopes? Name any three radioisotope elements used in biological research. Give an example for each. (5)

5. (a) What is DNA polymorphism? Briefly explain the techniques and applications of RFLP, and AFLP. (10)
- (b) Role of SDS and TEMED in PAGE. (5)
6. What are the differences between Southern, Northern, and Western blotting techniques? Briefly describe their applications. (15)