

effect on resolution if numerical aperture of lens is increased or decreased.

- (b) Why ultracentrifuges are refrigerated and heavily armored.
- (c) Why are fixatives used during sample preparation in microscopy?
- (d) The "Temperature, pH and osmotic potential of the medium are important during homogenization of the tissue." Justify the statement.
- (e) TLC is advantageous over paper chromatography. Why?
- (f) DNA moves towards the positive electrode in AGE. Why?

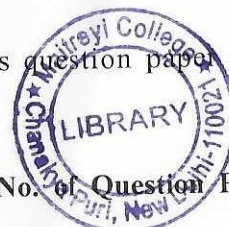
(ii) Using appropriate illustrations explain the working of Flow Cytometry. (5)

- 7
- (i) Discuss briefly the principle of centrifugation, and describe the procedures in the differential centrifugation technique for isolating subcellular particles. (5)
 - (ii) Elaborate the principles of pulse-chase experiment with suitable example. (5)
 - (iii) Explain the principle of spectrophotometer using Beer-Lamberts Law. (5)

(1000)

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[This question paper contains 4 printed pages.]



Your Roll No.....

Sr. No. of Question Paper : 4428

G

Unique Paper Code : 32167503

Name of the Paper : Analytical Techniques in Plant Sciences

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

Semester : V

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **five** questions in all, including Question 1 which is compulsory.
3. Attempt all parts of a question together.

1. (i) Define (**any five**) : (1×5=5)

- (a) R_f
- (b) Fluorochromes
- (c) Half-Life
- (d) Magnification
- (e) Chromosome painting

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- (f) Cryofixation
(g) Blotting technique
- (ii) Match the columns : (1×5=5)
- | | |
|---------------------|-------------------------|
| (a) Albert Claude | (i) Confocal Microscopy |
| (b) James Alwine | (ii) Chromatography |
| (c) Henri Becquerel | (iii) Northern Blotting |
| (d) Marvin Minsky | (iv) Autoradiography |
| (e) Tswett | (v) Centrifugation |
- (iii) Expand (**any five**) : (1×5=5)
- (a) CBB
(b) GFP
(c) RPM
(d) FACS
(e) MALDI
(f) ELISA
2. With the help of labelled illustrations only explain the steps of (**any three**) : (5×3=15)
- (i) Southern Hybridization
(ii) Polyacrylamide Gel Electrophoresis
(iii) Ion Exchange Chromatography
(iv) FISH

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3. Differentiate between the following (**any three**) : (5×3=15)
- (i) Scanning, and Transmission Electron microscopy
(ii) HPLC and GLC
(iii) Paper, and, Thin layer Chromatography
(iv) Freeze-fracture, and, Freeze-etching
4. Write short notes on **any three** of the following : (5×3=15)
- (i) Shadow Casting
(ii) Affinity Chromatography
(iii) Applications of Radioisotopes in research
(iv) Marker Enzymes
5. Describe the principle and applications of the following techniques (**any three**) : (5×3=15)
- (i) X-Ray Diffraction
(ii) Column Chromatography
(iii) Ultracentrifugation
(iv) Confocal Microscopy
6. (i) Give brief answers to the following. Attempt **any five** : (2×5=10)
- (a) What is the difference between resolution and magnification? What would be the

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