

63/1 (SEM-5) DSE1/BOTHE5016

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(Held in 2023)

BOTANY

Paper : BOTHE5016

(Analytical Techniques in Plant Sciences)

Full Marks : 60

Pass Marks : 24

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

1. Choose the correct answer of the following : 1×5=5

(a) SEM is used for producing

(i) anatomical (feature) diagram

(ii) 3-D like image

(iii) cell structure and morphology

(iv) tissue and organ structure

(b) R_f value in chromatography means

(i) distance moved by solvent / distance
moved by sub substance on
compound

(ii) distance moved by compound /
distance moved by solvent

(2)

- (iii) measuring the rate of reaction
(iv) measuring the product of reaction
- (c) Measure central tendency by calculating
- (i) mean
 - (ii) mean and mode
 - (iii) mean, mode and median
 - (iv) mode and median
- (d) Compound used for creating density gradient during centrifugation is
- (i) $MgCl_2$
 - (ii) $CsCl_2$
 - (iii) $FeCl_3$
 - (iv) $CuSO_4$
- (e) The magnifying power of the compound microscope is the product of
- (i) objective \times ocular lens
 - (ii) mirror power
 - (iii) convex and concave lenses
 - (iv) measure the resolving power

(3)

2. Answer the following questions : 2 \times 5=10
- (a) What is pulse-chase experiment? What are its advantages? 1+1=2
 - (b) What is negative staining? Give any two examples. 1+1=2
 - (c) What is the basic difference between AGE and PAGE? 2
 - (d) What is marker enzyme? Name the best marker enzymes for mitochondria. 1+1=2
 - (e) What is Pearson's chi-square test? Mention the basic difference between chi-square and Pearson correlation. 1+1=2
3. Write short notes on any five of the following : 5 \times 5=25
- (a) Applications of fluorescence microscopy
 - (b) Representation of biological data
 - (c) Thin-layer chromatography
 - (d) Beer-Lambert law and its application
 - (e) Autoradiography
 - (f) Transmission electron microscope
 - (g) X-ray crystallography

(Turn Over)

4. Answer any *two* of the following questions :

10×2=20

- (a) What is radioisotope? Write a detailed account on the application of radioisotopes in biological research with suitable examples. 2+8=10
- (b) What is centrifugation? Write an explanatory note on its working principle and application. 2+4+4=10
- (c) What is meant by chromosome banding? What are the reasons for occurrence of different chromosome bands? Explain in detail the types of chromosome banding techniques in karyotyping. 2+2+6=10
