DSE-I:Analytical techniques in plant sciences

Unit-1

1. Answer the following questions:(1×8)

(1) ____ is used in electron microscope?

(2)Degree of scattering in transmission electron microscope is a function of ____.

(3)Nagative staining is used for examining____.

(4)____helps us in getting three dimensional picture of specimen.

(5)Flow cytometry uses____.

(6)___Fluorescent dye can be used for red flourescence?

2. Answer the following questions:(2×8)

(1)FACS(2)Light microscope(3)Freeze etching (4)Freeze fracture

Unit-2

1. Answer the following questions: (1x 8 =8)

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i) The main purpose of cell fractionation is to ------------------.

ii) In cell fractionation various components of cells including its organelles can be

isolated in different layers depending upon their physical properties such as --------

and ------------.

iii) In cell fractionation, the various fractions obtained during differential centrifugation

are ---------------, ----------------- and ----------.

iv) ---------- first developed the ultracentrifuge which he used to estimate the molecular

weight of ------------------.

Group-B

2. Answer the following questions: (1.5x 8 =12)

i) What is homogenization?

ii) Which cells are toughest to homogenize and why?

iii) What are the 3 criteria an isolation medium should have?

iv) What is Svedberg unit? Why is it used?

v) What is a spectrophotometer?

vi) What are the different radiant energy sources for spectrophotometer?

vii)What are the wavelengths used for nucleic acids and proteins in spectrophotometer?

viii)

What are the different radio-isotopes that can be used for DNA research?

Group-C

3. Answer the following questions: (2x 8 =16)

i) What is cell fractionation? Name its 3 basic steps.

ii) What is differential velocity centrifugation?

iii) What is density gradient centrifugation?

iv) What is the role of marker enzymes in cell fractionation?

v) What is autoradiography?

vi) What is pulse chase experiment?

vii)How spectrophotometer can be used for enzyme assay?

Viii)Define beer-Lamberts law.

4. Answer the following questions: (6x4= 24)

i) Give a general account of differential centrifugation technique.

ii) Give a general account of density gradient centrifugation technique.

iii) What are radioisotopes? Discuss their role in biological research.

iv) Describe the working principle of a spectrophotometer and its role in biological research.

Unit-3

Answer the following questions: (1x 8 =8)

i) In ----------------- chromatography, the stationary phase is held in a narrow tube and

the mobile phase is forced through it under high pressure.

ii) In chromatography the stationary phase can be -------- or ------------ supported on a

solid.

iii) In chromatography mobile phase can be -------------- or --------------.

iv) In electrophoresis, under the influence of electric field the -------- charged DNA

moves towards ---------- end of the gel.

v) The technique of electrophoresis was developed by -----------------.

Group-B

2. Answer the following questions: (1.5x 8 =12)

i) What is chromatography?

ii) What is electrophoresis?

iii) What is the dye used for DNA in gel electrophoresis and why?

iv) What are the factors that influence the migration of charged molecules in

electrophoresis?

v) For what purpose x-ray crystallography is used?

vi) What is retention factor in chromatography?

vii)What are the factors affecting column efficiency?

viii)How gas chromatography does differ from other forms of chromatography?

Group-C

3. Answer the following questions: (2x 8 =16)

i) What is TLC?

ii) What is Affinity chromatography?

iii) What is paper chromatography?

iv) What are the different types of gel electrophoresis?

v) What is mass spectrometry?

vi) What is the role of buffer in gel electrophoresis?

vii)What is reverse phase HPLC?

viii)What is the role of mobile phase?

Group-D

Answer the following questions: (6x4= 24)

i) Discuss the method of gel electrophoresis for nucleic acid separation.

ii) Discuss the basic principles of gel permeation chromatography.

iii) Discuss the working principle, application and limitations of ion exchange

chromatography

iv) Discuss the method of gel electrophoresis for protein separation.

Unit-4

i) The word 'statistik' in German means ------------------.

ii) The application of statistical methods in biology is called ------------.

iii) Biostatistics is also called as ---------- and it was coined by ------------ .

iv) The father of biostatistics is --------------.

v) Number of fruits on a tree is -------------- variable.

vi) Quantitative variables that can have any numerical value is called ----------------

variable.

vii)Quantitative variables that has only fixed or finite values are called ------------

variables.

Group-B

2. Answer the following questions: (1.5x 8 =12)

i) What is graphical representation of data?

ii) What is biased sampling? Discuss with example.

iii) What is cumulative frequency?

iv) What is range?

v) What is central tendency?

vi) What is mean deviation?

vii)How population mean differs from sample mean?

viii)What is null hypothesis?

Group-C

3. Answer the following questions: (2x 8 =16)

i) What is biostatistics?

ii) How data can be represented?

iii) What is Arithmetic mean?

iv) What is Mode?

v) What is standard deviation?

vi) What is dispersion?

vii)What is t-test and what is its application?

viii)What is variance?

Group-D

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