2015

BOTANY

Paper : 104

INSTRUMENTATION AND LABORATORY TECHNIQUES

Full Marks : 80

Time : 3 hours

The figures in the margin indicates full marks for the questions

1. Answer the following Multiple choice Questions: 1X9=9

   a. A mixture containing two proteins having similar molecular mass but different oligomeric properties can be separated by

      i. SDS-PAGE analysis

      ii. Native PAGE analysis

      iii. Isoelectric focusing

      iv. Both b and c....

   b. In agarose gel electrophoresis

      i. DNA migrates towards the negative electrode

      ii. Super coiled plasmids migrate slower than their nicked counterparts

      iii. Larger molecules migrate faster than smaller molecules

      iv. Ethidium bromide can be used to visualize the DNA.

P.T.O.

c. The magnification of a compound microscope depends upon:

a Focal length of objective lense

b Focal length of eyepiece

c Tube length of eye piece

d Numerical aperture of the objective

Codes

i. a,b,c

ii. a,b,d

iii. b,c,d

iv. a,c,d

d. Which of the radio isotopes are used to label red blood cells

i. Sodium-24

ii. Chromium-51

iii. Iron-59

iv. Copper-64

e. In ELIZA the antigen or antibody is labeled with

i. Horseradish peroxidase

ii. Radio isotopes

iii. Colloidal gold

iv. Fluorescein isothiocyanate

f. Western Blots are primarily to detect

i. Protien

ii. Carbohydrate

iii. DNA

iv. RNA

g. Thin Layer chromatography is a

i. partition chromatography

ii. electrical mobility of ionic species

iii. adsorption chromatography

iv. none of the above

h. Which of the following redioactive element is generally involved in RIA

i. Tritinium

ii. Carbon-14

iii. Iodine-125

iv. All of the above

i. Carbon dating is good for dating objects that are:

i. Between 50-500 yr old

ii. Between 500-50,000 yr old

iii. Between 50,000-50,000,0 yr old

iv. More than 50,0000yr old

2. Answer the following questions: 2X6=12

a. What is resolution? What are the factors that affect on the resolution of microscope?

b. Distinguish between holotype and isotype.

c. What do you mean by Herberia? Cite examples of Indian Herbaria.

d. Write two application of gel electrophoresis in biotechnology.

e. What is buffer? Why is buffer used in biological techniques?

f. What is the application of colorimeter? How does it differ from spectrophotometer?

3. Write brief notes: 5X4=20

a. Maceration preparation

b. Ginger Muller counter

c. Discovery of Radioisotopes

d. Write the working principle of SDS-PAGE.

e. Distinguish between ELIZA and RIA

4. Answer the following questions:

a. What is Radioisotope? Explain the application of Radioisotope in biological research. 3+6=9

b. What is stain and mordent? Discuss in detail the different staining techniques used in microscopy. Cite suitable examples. 2+7=9

c. Explain in detail the working principle of Phase contrast microscopy. What are its advantages and limitation? 5+4=9

5. Give an account on collection, preparation and preservation technique of Herbarium specimen.

Or

6. Write the working principal and applications of the following: (Any two)

b) TEM

c) Spectrophotometer

d) Thin layer Chromatography

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