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SARDAR PATEL UNIVERSITY
M.Sc., 1st Semester examination
Saturday, 1st December 2012
10.30 a.m to 1.30 p.m
PS01CBOT02- Bioinstrumentation

Max.Marks : 70

Q. 1. Choose the correct answer

(1x8=8)

(i) Adsorption chromatography will have

- a. liquid stationary phase c. either liquid or solid stationary phase
b. solid stationary phase d. none of the above

(ii) The wave length of fluorescent light is

- a. longer than the incident light c. same as the incident light
b. shorter than the incident light d. none of the above

(iii) Resolution of microscope is limited by the

- a. numerical aperture c. both numerical aperture and wave length
b. wave length d. none of the above

(iv) Flame ionization detector is a

- a. non destructive detector c. general purpose detector
b. destructive detector d. both b and c

(v) UV radiation induces _____ transitions.

- a. electronic c. nuclear
b. atomic d. molecular

(vi) In ESR spectroscopy the following sources of energy are used

- a. magnetic and UV c. radiowave and microwave
b. magnetic and microwave d. Infra Red and Microwave

(vii) In MALDI-TOF, a matrix is used to ionize the sample to facilitate

- a. vaporization of sample c. easy ionization of sample

- b. soft ionization of sample d. none of these

(viii) Biosensors essentially contain

- a. biocatalyst and transducer c. biocatalyst and an enzyme
b. transducers and a detector d. only biocatalysts

Q.2 Answer any seven :

(2x7=14)

- a. Define: aberration of a lens
b. Define: tunneling current
c. Differentiate bonded phase and liquid-liquid chromatography
d. What is the function of riboflavin in photopolymerization of acrylamide gel?
e. What is meant by long pass filter?
f. Write any two desirable properties of radiation sources used in spectroscopy
g. Define 'Chemical shift'
h. What are 'parent ion and fragmentation ions'?
i. Define transducer. Give one example for a transducer

Q. 3. (a) Write a brief note on instrumentation of phase contrast microscope. (06)

(b) Explain the scanning modes in scanning tunneling microscope. (06)

OR

(b) Write a note on construction and function of electron gun. (06)

Q.4. (a) Explain the process of differential centrifugation. (06)

(b) Explain the principle and application of gel filtration chromatography. (06)

OR

(b) Write note on isoelectric focusing. (06)

Q.5. (a) List the methods for radioactive decay. Describe decay by beta particle emission. (06)

(b) Write notes on

i) Photomultiplier tube

ii) Golay cell

(06)

OR

b) Explain any one method for protein sequencing by Mass Spectroscopy.

(06)

Q.6. (a) Describe 'Bragg's rule". What are the applications of X-ray diffraction analysis?

(06)

(b) Explain the working of T-cell in ESR spectroscopy in detail.

(06)

OR

(b) What are Biosensors? Explain the working principle of any one biosensor.

(06)

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