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SARDAR PATEL UNIVERSITY
M.Sc., 1st Semester examination
Saturday, 1st December
10.30 a.m to 1.30 p.m
PS01CBIC02- Bioinstrumentation

Max.Marks 70

Q. 1. Choose the correct answer

(1x8=8)

- (i) Partition chromatography will have
- a. liquid stationary phase
 - b. solid stationary phase
 - c. either liquid or solid stationary phase
 - d. none of the above
- (ii) The wave length of fluorescent light is
- a. longer than the incident light
 - b. shorter than the incident light
 - c. same as the incident light
 - d. none of the above
- (iii) Resolution of microscope is limited by the
- a. numerical aperture
 - b. wave length
 - c. both numerical aperture and wave length
 - d. none of the above
- (iv) Flame ionization detector is a
- a. non destructive detector
 - b. destructive detector
 - c. general purpose detector
 - d. both b and c
- (v) In IR spectroscopy, water is not used as a solvent since
- a. Water has two proton
 - b. Water has a high dielectric constant
 - c. Water is polar in nature
 - d. None of the above
- (vi) In NMR spectroscopy the following sources of energy are used
- a. magnetic and microwave
 - b. magnetic and radiowave
 - c. radiowave and microwave
 - d. visible and radiowave
- (vii) In positron emission, the atomic number----- and the mass number -----
- a. Reduces and remains same
 - b. Both remain same
 - c. increases and decreases
 - d. both decrease

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 interference in microscopy
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 affinity chromatography. (06)

OR

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

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

(b) Write notes on

i) Photodiode array

ii) Thermistor

(06)

OR

b) Explain Peptide Mass Fingerprinting 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 desirable properties and uses of biosensors.

(06)

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