SEAT No._____ No. of Printed Pages : 2

[23/25/41]

SARDAR PATEL UNIVERSITY
M.Sc (I Semester) Examinations
Thursday, 12th April, 2018
10.00 am to 1.00 pm
PS01CBIT22/PS01CBIC22/PS01CMIC22 – Bioinstrumentation
Total marks: 70

I. Choose the correct answers. **(08)**

i) Atomic force microscope is a type of
- a) Light microscope
- b) Electron microscope
- c) Scanning probe microscope
- d) None of the above

ii) Three dimensional image is possible with
- a) Fluorescence microscope
- b) Phase contrast microscope
- c) Confocal microscope
- d) None of the above

iii) Which one of the following gases can not be used as carrier gas
- a) Nitrogen
- b) Helium
- c) Argon
- d) Oxygen

iv) The separation of charged molecule under the influence electric field is known as
- a) Colony hybridization
- b) Dot plot technique
- c) Electrophoresis
- d) None of the above

v) The most suitable spectroscopic method for elemental analysis is
- a) UV- Visible
- b) Infra red
- c) Atomic absorption
- d) Electron spin resonance

vi) In MALDI, the matrix is used, primarily to achieve
- a) Extensive fragmentation of sample
- b) Soft ionization
- c) Detection of ions
- d) Acceleration of ions

vii) To achieve resonance of proton, along with magnetic energy _____ is also used in NMR spectroscopy.
- a) Radio wave
- b) UV rays
- c) X-rays
- d) Gamma rays

viii) 'Group frequency' and finger printing' regions are part of
- a) Near IR spectrum
- b) Far IR spectrum
- c) Visible spectrum
- d) Mid IR spectrum

[P.T.O.]

2. Attempt any **seven** **7x2=14**

i) Define: Depth of focus
ii) Define:Lens aberration
iii) Define:Buoyant density
iv) Write a note on Capillary column
v) What is known as Stokes's shift?
vi) Define: Molar absorbtivity
vii) Comment on Crystallization of biological samples for x-ray diffraction
viii) Define: Chemical shift
ix) What is meant by half life of radioisotopes

3. a) Enlist the type of filters used in Epi-fluorescence microscope and explain their functions. (06)
b) Simultaneous analysis of multiple parameters are possible with Flow-cytometer. Explain. (06)

OR

b) Explain the basic instrumentation of scanning tunnelling microscope. (06)

4. a) Write notes on a) Isotachophoresis b) Electroendosmosis (06)
b) Explain the rate zonal rotors with illustrations. (06)

OR

b) Explain the basic instrumentation of gas liquid chromatography. (06)

5. a) Explain the working of photodiode array in detail (06)

b) Explain the principle of IR spectroscopy. (06)

OR

b) Outline the principle and uses of Geiger-Muller counter? (06)

6. a) Explain Time-of- Flight analyzer in mass spectroscopy. (06)
b) Write a brief note on liquid scintillation counting (06)

OR

b) Explain X-ray diffraction technique in brief. (06)