[96] SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

M.Sc. (I Semester) Biochemistry Examination

24th October, 2018 (Wednesday)

Paper: PS01CBIC22- BIOINSTRUMENTATION

TIME- 10.00AM - 01.00PM

TOTAL MARKS: 70

Q-1 Choose the most appropriate answer: **(8)**

1. Which of the following microscopy is best suited to get the surface view of an object?
   (a) SEM (b) STM
   (c) TEM (d) Both 'a' and 'b'

2. Refractive index of air is _____
   (a) 0.50 (b) 0.75 (c) 1.00 (d) 1.25

3. In equation, $G = \omega^2 r$, ω denotes
   (a) angular velocity (b) radial distance (c) centrifugal force (d) none

4. Separating gel has a pH of _____.
   (a) 8.8 (b) 6.8 (c) 7.8 (d) 8.8

5. The most sensitive method for measurement of weak β emitters is_____
   (a) Autoradiography (b) solid scintillation counting
   (c) Liquid scintillation counting (d) none of these

6. For UV Spectrophotometer, only quartz cuvette is to be used because __
   (a) Quartz is unbreakable (b) Quartz is transparent to UV
   (c) Quartz is opaque to UV radiation (d) Quartz is cheaper than glass

7. Which of the following techniques may be employed for determination of molecular mass of an analyte?
   (a) AAS (b) MALDI-TOF (c) IEF (d) IR spectroscopy

8. A biosensor consists of all of the following components except:
   (a) Transducer (b) Quadrupole analyser
   (c) Biocatalyst (d) electronic processor

CP-T01

Q-2 Answer in Brief: (Any Seven) **(14)**

1. Define interference
2. What is the function of pin hole aperture in confocal microsopy?
3. What is electroendoosmosis?
4. What is the advantage of solvent saturation in TLC chamber?
5. Define chemical shift. What is its significance in NMR spectroscopy
6. What are the limitations of IR spectroscopy?
7. Write a note on Total consumption burner.
8. What are the essential properties of density gradient materials?
9. What is Cerenkov radiation?

Q-3 **(A)** Explain the role of filters in fluorescence microscope. **(06)**

(B) Explain the process of image formation in STM **(06)**

OR

(B) Write a note on the various sources of illumination used in light microscopes. **(06)**

Q-4 **(A)** Describe the principle and applications of SDS PAGE. **(06)**

(B) Explain analytical Ultracentrifugation. **(06)**

OR

(B) Write a note on the principle and advantages of affinity chromatography. **(06)**

Q-5 **(A)** Explain the basic theory of IR spectroscopy including the types of IR induced molecular vibrations. **(06)**

(B) Write a note on spin-spin interaction in NMR spectroscopy. **(06)**

OR

(B) Write a note on:
(i) Photodiode array **(ii)** Deuterium discharge lamp **(06)**

Q-6 **(A)** Explain the principle of MALDI TOF. What are its applications? **(06)**

(B) Write a note on the desirable properties of Biosensors. **(06)**

OR

(B) Write a note on the sample positioning methods for Autoradiography. **(06)**

—X—