

[99/126]

SEAT No. \_\_\_\_\_

No. of Printed Pages : 2

**SARDAR PATEL UNIVERSITY**

**M.Sc. (I Semester) Examination**

**24<sup>th</sup> October, 2018 (Wednesday)**

**Paper: PS01CBOT22/ PS01CZOO22- BIOINSTRUMENTATION**

**TIME- 10.00AM - 01.00PM**

**TOTAL MARKS: 70**

**(8)**

**Q-1 Choose the most appropriate answer:**

- i. Which of the following microscopy is used to visualize live cells?  
(a) SEM (b) Phase contrast microscopy  
(c) TEM (d) All of these
- ii. Refractive index of air is \_\_\_\_\_  
(a) 0.50 (b) 0.75 (c) 1.00 (d) 1.25
- iii. In equation,  $G = \omega^2 r$ ,  $\omega$  denotes  
(a) angular velocity (b) radial distance (c) centrifugal force (d) none
- iv. Separating gel has a pH of \_\_\_\_\_  
(a) 8.8 (b) 6.8 (c) 7.8 (d) 8.8
- v. The most sensitive method for measurement of weak  $\beta$  emitters is \_\_\_\_\_  
(a) Autoradiography (b) solid scintillation counting  
(c) Liquid scintillation counting (d) none of these
- vi. 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
- vii. 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
- viii. A biosensor converts a biological reaction finally into  
(a) chemical signal (b) photo signal  
(c) electrical signal (d) none of these

(1)

(P.T.O.)

(14)

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

- i. Define: Lens
- ii. What is the function of pin hole aperture in confocal microscopy?
- iii. What is electroendosmosis?
- iv. What is the advantage of solvent saturation in TLC chamber?
- v. Define chemical shift. What is its significance in NMR spectroscopy?
- vi. What are the limitations of IR spectroscopy?
- vii. Write a note on beta particle emission.
- viii. What are the essential properties of density gradient materials?
- ix. What is Cerenkov radiation?

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

**(B) Explain the scanning modes in AFM (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 gel filtration 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 applications and limitations of NMR spectroscopy. (06)**

**OR**

**(B) Write a note on:** (06)

- (i) Photodiode array      (ii) Deuterium discharge lamp

**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 —

(2)