

[489]

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

No. of Printed Pages: 02

**SARDAR PATEL UNIVERSITY**  
**M. Sc. (Integrated) Biotechnology – Sixth Semester Examination**  
**Thursday, 28<sup>th</sup> March, 2019**  
**02:00 p.m. to 05:00 p.m.**

**PS06CIGB05: Bioanalytical Techniques**

- Note: 1) Figures to the right indicate marks  
2) Draw diagram wherever necessary

**Total marks: 70**

**Q-1 Choose the most appropriate alternative for the following:**

**(08)**

1. Which of the following wavelength range is associated with visible spectroscopy?
  - a) 0.8-500 $\mu\text{m}$
  - b) 400-150nm
  - c) 380-750nm
  - d) 0.01-10nm
2. What is the unit of absorbance, derived from Beer Lambert's law?
  - a)  $\text{Lmol}^{-1}\text{cm}^{-1}$
  - b) cm
  - c)  $\text{Lgm}^{-1}\text{cm}^{-1}$
  - d) No unit
3. Which of the following is not true about absorption spectroscopy?
  - a) It involves transmission.
  - b) Scattering is kept maximum.
  - c) Reflection is kept maximum.
  - d) Intensity of radiation leaving the substance is an indication of concentration.
4. \_\_\_\_\_ is used to obtain monochromatic microwave radiation in ESR.
  - a) Prism
  - b) Gratings
  - c) Klystron oscillator
  - d) All of these
5. Sample holder of NMR must be \_\_\_\_\_.
  - a) Chemically inert
  - b) Durable
  - c) Transparent of Rf radiation
  - d) All of these
6. In mass spectroscopy, the mass spectrum is a plot of the \_\_\_\_\_ of the ions at each m/z ratio.
  - a) Resonance frequency
  - b) Relative abundance
  - c) Atomization
  - d) None of these
7. In solid scintillation counting, for  $\beta$  – emitters organic scintillation such as \_\_\_\_\_ are used.
  - a) Zinc sulfate
  - b) Sodium iodide
  - c) Ammonium per sulfate
  - d) None of these
8. Which of the following is/are the type non-ionization radiation?
  - a) Light
  - b) Radio waves
  - c) Infra red
  - d) All of these

**[P.T.O.]**

Q-2 Attempt ANY SEVEN from the following: (14)

1. What is hyperchromic and hypsochromic effect?
2. List limitations of UV spectrophotometer.
3. Draw a block diagram of colorimeter.
4. Enlist advantages of AES.
5. What is the role of monochromator in spectroscopy? Give advantages of grating over prism as a monochromator.
6. What do you mean by nuclear resonance?
7. Write the principle of fluorescence spectroscopy.
8. Give applications of nuclear active analysis.
9. What do you mean by radio ligand assay technique?

Q-3 (a) Describe light sources and wavelength selectors used in UV spectrometer. (06)  
(b) Write Beer's law. Explain factors affecting Beer's law. (06)

OR

(b) Enlist detectors used in UV visible spectroscopy. Explain any two in detail. (06)

Q-4 (a) Write applications and limitations of IR spectroscopy. (06)  
(b) Give an account on ESR. (06)

OR

(b) Describe in detail: (06)  
1. Thermocouple  
2. Golay cell

Q-5 (a) Write a note on MALDI-TOF. (06)  
(b) Discuss various applications of fluorescence spectroscopy in detail. (06)

OR

(b) Give a detailed account on shielding and de-shielding effect in NMR spectroscopy. (06)

Q-6 (a) Describe radiometric titration method in detail. (06)  
(b) Define radiation. Explain any two methods used for the detection and quantifying radioactivity. (06)

OR

(b) Write a note on autoradiography. (06)

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(2)