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No. of Printed Pages: 02

[A-2]

SARDAR PATEL UNIVERSITY

M. Sc. (Integrated) Biotechnology – Sixth Semester Examination

Wednesday, 26<sup>th</sup> October, 2016

10:00 a.m. to 01:00 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.  $\log_{10} I/I_0 = abc$ , where  $I/I_0$  is \_\_\_\_\_.
  - a) Absorbance
  - b) Transmittance
  - c) Concentration
  - d) Time
2. Beer's law stated that the amount of light absorbed by a material is directly proportional to the
  - a) Temperature of absorbing solution
  - b) Concentration of absorbing solution
  - c) Thickness of absorbing material
  - d) All of these
3. In mull technique, sample can be ground with
  - a) Liquid paraffin
  - b) 0.1 M HCl
  - c) 0.01M HCl
  - d) None of these
4. The very near infrared region ranges from \_\_\_\_\_ to \_\_\_\_\_.
  - a) 1.5, 2.5
  - b) 1.2, 2.5
  - c) 2.5, 25
  - d) 25, 300
5. Fluorescence is \_\_\_\_\_ phenomenon.
  - a) Absorption
  - b) Emission
  - c) Transmission
  - d) None of these
6. In NMR, sample holder is \_\_\_\_\_ employed.
  - a) Metal
  - b) Quartz
  - c) Glass
  - d) Both a) & b)
7. Ionization radiation is produced by
  - a) Stable atom
  - b) Unstable atom
  - c) Both a) & b)
  - d) None of these
8. \_\_\_\_\_ has the highest ability to induce ionization.
  - a)  $\alpha$ -particles
  - b)  $\beta$ -particles
  - c)  $\gamma$ -radiation
  - d) X-rays

[P.T.O.]

- Q-2 Attempt ANY SEVEN from the following: (14)
1. Write Lambert's law.
  2. Define auxochromic and bathochromic effect.
  3. Enlist applications of visible spectrometer.
  4. Which are the advantages of grating monochromator over prism?
  5. Narrate applications of IR spectroscopy.
  6. Write the principle of fluorescence spectroscopy.
  7. What do you mean by resonance in NMR?
  8. Give the principle of radio ligand assay technique.
  9. Write in brief: Liquid scintillation counting.
- Q-3 (a) Explain the wavelength selectors used in UV Visible spectrometer. (06)  
(b) Give an account on: (06)  
1. Photovoltaic cells  
2. Phototubes
- OR
- (b) Discuss the factors affecting Beer's law. (06)
- Q-4 (a) Describe radiation sources and detectors used in IR spectroscopy. (06)  
(b) Discuss any two components of ESR spectroscopy. (06)
- OR
- (b) Give applications of AES. (06)
- Q-5 (a) What do you mean by chemical shift? Give a detailed account on NMR spectroscopy. (06)  
(b) Discuss the instrumentation of mass spectroscopy and its applications. (06)
- OR
- (b) Give a detailed account on shielding and de-shielding in NMR spectroscopy. (06)
- Q-6 (a) Write a detailed note on radiometric titration method. (06)  
(b) Explain autoradiography technique in detail. (06)
- OR
- (b) Discuss in detail: (06)  
1. Solid scintillation counting method  
2. Applications of nuclear active analysis

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