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SEAT No._____

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SARDAR PATEL UNIVERSITY

M.Sc. (Integrated) Biotechnology

Sixth Semester Examination

Friday, 20th April, 2018

02.00 p.m. to 05:00 p.m.

PS06CIGB05: Bio-analytical Techniques

Total Marks: 70

Note: (1) Figures to the right indicate marks.
(2) Draw a neat and labeled diagram, wherever necessary.

Q. 1 Choose the most appropriate answer from the four alternatives given: [08]

(i). ..... is the most commonly used source for visible radiation.

(a) Tungsten filament lamp (b) Nernst glower (c) Hydrogen lamp (d) Mercury arc

(ii). The Wavelength of an absorption spectrum is 275nm. In what part of the electromagnetic spectrum does it lie?

(a) Radiowave (b) Microwave (c) UV-visible (d) Infra red

(iii). Which of the following is not true for bolometer?

(a) Electrical resistance increases with increase of temperature

(b) Electrical resistance decreases with increase of temperature

(c) Made one arm of wheatstone bridge

(d) None of these

(iv). Electron spin resonance uses the detection of a physical phenomenon of .....of electromagnetic radiation.

(a) Adsorption (b) Absorption (c) Radiation (d) Reflection

(v). Fluorescence spectroscopy deals with..... phenomenon.

(a) Emission (b) Absorbance (c) Transmission (d) None of them

(vi). NMR spectra become complicated by.....

(a) Spin spin coupling (b) Shielding and deshielding effect

(c) Both (a) and (b) (d) None of these

(vii). Ionization radiation is produced by.....

(a) Stable atom (b) Unstable atom

(c) Both (a) and (b) (d) None of them

(viii). In autoradiography, ...acts upon a photography emulsion to produce a latent image.

(a) Non ionizing radiation (b) Ionization radiation

(c) Visible radiation (d) None of them

C.P.T.O.

Q.2 **Answer any SEVEN from the following:** **[14]**

(i). Write a short note on sources of UV radiation.

(ii). Draw a labeled diagram of single beam monochromator.

(iii). List advantages of golay cell as a detector.

(iv). Write principle of emission flame photometry.

(v). Define stoke shifts.

(vi). Write a short note on RF generator of NMR.

(vii). How ionization taken place in mass spectroscopy.

(viii). Write the principle of radio immunoassay technique.

(ix). Write a short note on autoradiography.

Q.3 (a) Write beer's-Lambert's law. Describe Lambert's law in detail. **[6]**

(b) Give an account on: (i) Barrier layer cell (ii) Photomultipliers **[3+3]**

OR

(b) What are auxochromes? Explain auxochrome effect in detail. **[6]**

Q.4 (a) Give advantages and disadvantages of AES. **[6]**

(b) Draw block diagram of AAS. Explain the role of chopper, atomic vapour producer and nebulizer. **[6]**

OR

(b) Discuss techniques used for solid sample preparation in IR spectroscopy. **[6]**

Q.5 (a) Write in detail about principle and instrumentation of Fluorescence spectroscopy. **[6]**

(b) Give an account on MALDI-TOF and discuss various applications of Mass spectroscopy. **[6]**

OR

(b) Write the principle and important applications of NMR spectroscopy in details. **[6]**

Q.6 (a) Explain in detail about any two methods used for radiation detection. **[6]**

(b) Write a detail note on nuclear active analysis. **[6]**

OR

(b) Give a detail account on radio ligand assay technique. **[6]**

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