

[A-57]

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SARDAR PATEL UNIVERSITY

T.Y.B.Sc. Examination, SIXTH Semester

Saturday, 9TH April 2016

Time : 02.30 pm To 05.30 pm

Instrumentation Course Code : USO6CINS06

Course Title : Analytical and Biomedical Instrumentation

Total Marks : 70

Q-1 Write answers to the following multiple choice questions in your answer book by selecting the proper option. [10]

- (1) In the interference filter, the transparent film is made up by ____.
(a) gold (b) copper (c) silver (d) nickel
- (2) ____ Hz is the frequency range of alpha(α) state.
(a) 0.5 - 4 (b) 4 - 8 (c) 8 - 13 (d) 13 - 22
- (3) In absorption instruments, as a detecting system, ____ is used.
(a) phototube (b) Hg tube (c) photomultiplier (d) Ag tube
- (4) In the Beer-Lambert's law, the absorbance (A) in the solution is given as
(a) $A = \epsilon bc / K$ (b) $A = \epsilon cb$ (c) $A = \epsilon cb / T$ (d) $A = K \epsilon c / b$
- (5) In the sample handling techniques, ____ window material is commonly used.
(a) NaCl (b) KCl (c) $AgCl_2$ (d) $CaCl_2$
- (6) The source of radiation in IR spectrometer is ideally a ____ radiator.
(a) black body (b) white body (c) silver body (d) golden body
- (7) Gas cell contains path length of ____ cm.
(a) 5 (b) 10 (c) 15 (d) 20
- (8) The full form of ECG is
(a) electro cardio gram (b) electric carbon graphy
(c) electro calibration gram (d) electro cardio graph
- (9) The Nernst filament is a small rod composed of fused rare oxides of Yttrium and ____.
(a) Zn (b) Zr (c) Pt (d) Au
- (10) The sample holder of NMR spectrometer is generally having a diameter of ____.
(a) 0.5 cm (b) 0.5 mm (c) 0.05 mm (d) 5 mm

Q-2 Answer the following questions in brief. (Answer any Ten Questions) [20]

- (1) Enlist the types of detectors for IR spectroscopy.
- (2) Enlist the parts of optical null method detectors.
- (3) Write a short note on optical filter.
- (4) Enlist the biomedical instruments.
- (5) Draw only the block diagram of EMG machine.
- (6) Define systolic & diastolic pressure.
- (7) Enlist the basic components of IR spectrophotometer.
- (8) Enlist the types of recording system in IR spectroscopy.
- (9) Enlist the basic components of NMR spectroscopy.
- (10) Enlist the various circulatory systems of our body.
- (11) Write a short note on chemical shift
- (12) What is the recording principle of ECG?

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- Q-3 (a)** Explain photomultiplier tube. [5]
(b) Write a note on interference filter. [5]
OR
- Q-3** Explain in detail the Beer-Lambert's law. Also explain how it deviates. [10]
- Q-4 (a)** Write a note on pneumatic detector. [5]
(b) Explain in brief the liquid cells. [5]
OR
- Q-4 (a)** Write a note on pyroelectric detector. [5]
(b) Write a short note on radiation sources. [5]
- Q-5** What is mass spectrometer? Explain in brief the types of mass spectrometers. Discuss the applications of it. [10]
OR
- Q-5** With necessary diagrams explain principle and construction of NMR. [10]
- Q-6 (a)** Write a short note on direct methods of monitoring blood pressure. [5]
(b) Write a note on bioelectric signals. [5]
OR
- Q-6 (a)** Write a short note on EEG. [5]
(b) Write a note on damping adjustment of the fluid. [5]

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