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SARDAR PATEL UNIVERSITY

M.Sc. Semester –I (Forensic Science) Examination

TUESDAY, 25th, October, 2016

PS01CFSC02: INSTRUMENTAL METHODS- PHYSICAL

TIME- 10.00AM - 01.00PM

TOTAL MARKS- 70

Instructions:

1. Answer of all the questions (including multiple choice questions) should be written in the provided answer book only.
2. All the questions are compulsory.
3. Figures to the right indicate maximum marks of the questions.

Q-1 Multiple Choice Questions:

(8)

1. Frequency can be represented by _____.
(a) Hz
(b) cps
(c) MHz
(d) All of the above.
2. Potentiometry is _____ method.
(a) Optical
(b) Electrochemical
(c) Thermal
(d) Separational
3. _____ electronic transition is not possible at all.
(a) n to σ
(b) σ to π^*
(c) n to σ^*
(d) None of these
4. Metastable state comes in _____.
(a) UV spectroscopy
(b) Fluorescence Spectrophotometry
(c) Both a & b
(d) Phosphorescence spectrometry
5. _____ is used as anode in Hollow Cathode Lamp.
(a) Tungsten
(b) Xenon
(c) Copper
(d) None of these
6. In AES, _____ emission spectra consists of discrete irregular lines.
(a) X-ray
(b) γ -rays
(c) Band
(d) Line
7. In 1904, _____ separated the radiations emitted by radioactive elements into 3 types.
(a) Ernest Rutherford
(b) Sir J.J. Thompson
(c) Neil Bohr
(d) James Chadwick
8. DTA is _____ technique.
(a) Quantitative
(b) Qualitative
(c) Both a & b
(d) None of these

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Q-2 Answer in Brief: (Write any Seven) (14)

1. What is Spectroscopy?
2. Define Spectra and Spectrum.
3. Give the definition of Chromatography.
4. What is the reason behind using two filters in Fluorimetry?
5. Write any two disadvantages of Atomic Absorption Spectroscopy.
6. Define NMR.
7. Differentiate between DTA and DSC
8. Explain in short three methods of X- ray techniques.
9. Draw the diagram for Instrumentation of AAS.

Q-3(A) Short note on:

- i) EMR (03)
 - ii) Absorption of EMR (03)
- (B) Explain in detail types of radiations. (06)

OR

- (B) Describe Analytical Techniques with the help of flow chart. (06)

Q-4(A) Describe in detail factors affecting Fluorescence (Any 6) (06)

- i) Explain principle of Phosphorimetry (03)
- ii) Give difference between Fluorimetry and Phosphorimetry. (03)

OR

- (B) Explain Spectrofluorometer with schematic diagram. Describe why source and detector are always kept at 90° . (06)

Q-5(A) Write a short note on radiation source and atomisers used in Atomic Absorption Spectroscopy. (06)

- (B) Give advantages and applications of Atomic Emission Spectroscopy. (06)

OR

- (B) Explain in detail Instrumentation of NMR. (06)

Q-6(A) Explain The Instrumentation of TGA. (06)

- (B) Explain the Principle of Raman Spectroscopy. (06)

OR

- (B) Write short note on
- (a) NAA. (03)
 - (b) Isotope dilution method. (03)