

SEAT No. _____

No. of Printed Pages: 2

SARDAR PATEL UNIVERSITY

M.Sc. (Chemistry) Semester-2 Examination

Tuesday.

Date: 26-03-2019

Time: 10.00 a.m. to 01.00 p.m.

Subject: Analytical Chemistry Paper: PS02ECHE21

N.B. (1) Figures to the right indicate full marks.

(2) Attempt all questions.

[Total Marks: 70]

I Select the correct answer from each of the following:

(08)

1. The chemical abstracts cover information in the form of
(a) General method of preparation, properties, use and references
(b) Describe research work done by scientist
(c) Comprehensive work with authors name, journal name etc.
(d) None of above
2. _____ error represents the experimental uncertainty that occurs in many measurement made by the same analyst under virtually identical conditions and they cannot be predicted or estimated.
(a) determinate (b) absolute (c) relative (d) indeterminate
3. Modern analytical chemistry is dominated by
(a) Computer (b) Instruments (c) Laboratory (d) Vehicle
4. Optical properties of HPTLC ensure a better signal/noise ratio in _____ evolution.
(a) densitometric (b) chromatographic (c) volumetric (d) photographic
5. A _____ is a deviation from the nominal value of standard which is considered to be negligible with respect to its intended use.
(a) random error (b) standardization (c) tolerance (d) above all
6. In chromatography, _____ on the time axis may serve to identify the components of the sample.
(a) position of peaks (b) area under the peaks
(c) number of peaks (d) height of peaks
7. The effect in which the energy of a photon is reduced and that of an electron is increased is called as _____.
(a) photocell detector (b) Compton effect (c) photoelectric effect (d) none of all
8. _____ is the energy traveling through space as a series of waves or as a stream of particle.
(a) continuous spectrum (b) radiation (c) microwave region (d) cosmic ray

2 Answer the following: (Any Seven)

(14)

- (i) What is statistical analysis? Enlist applications of statistical analysis.
- (ii) Define the terms electromagnetic radiations and electromagnetic spectrum.
- (iii) Write principle of size exclusion chromatography (SEC)?
- (iv) Explain at least three types of literature sources.
- (v) Define the terms: Sampling and Concurrent validation.

(1)

[P.T.O.]

- [vi] How will the reaction rate change in $A + 2B \leftrightarrow 2D + E$, if the concentrations of substance A increase three and of substance B four times?
- [vii] Enlist the factors which are affected on Rf value in paper chromatography.
- [viii] Explain difference between mean and median.
- [ix] Draw neat and labeled block diagram of typical absorption spectrometer.

3 [a] Classify the analytical techniques with suitable examples. (6)

OR

[a] Discuss in brief on verification and validation? Explain the categories of validation. (6)

[b] Define the cGMP and Discuss in detail on components of GMP. (6)

4 [a] Answer the following: (6)

[i] Explain the characteristics of primary and secondary standards?

[ii] If 30 mg of CuSO_4 (Mol. Wt. 159.5 g/mol) are contained in 2 ml of solution, determine the molarity and normality of the solution (For exchange reaction).

[b] Distinguish the following: (6)

[i] Accuracy and precision.

[ii] Determinate error and Indeterminate error.

OR

[b] Replicate samples of silicon alloy are analyzed and determined to contain 95.61, 95.67, 95.71 and 95.60% silver. Calculate (a) the standard deviation (b) the standard deviation of the mean (c) co-efficient of variation (d) the relative standard deviation of the mean. (6)

5 [a] Discuss the detecting and measuring radiant energy devices in spectroscopy. (6)

[b] Write a note on the interference filter. How it is superior over absorption filter? (6)

OR

[b] Answer the following: (6)

[i] Explain the importance of wavelength selection in quantitative techniques and methods used for the selection of wavelength.

[ii] Distinguish the 'continuum' and 'line' sources.

6 [a] Answer the following: (6)

[i] Differentiate: Normal phase chromatography and Reverse phase chromatography.

[ii] Describe the significance and factors affecting on Rf value in paper chromatography (PC).

[b] Draw neat and labeled schematic diagram of gas chromatograph and explain briefly each and every components. (6)

OR

[b] Give the classification of chromatographic techniques and explain in brief on principle of various chromatographic separation. (6)