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[22] SARDAR PATEL UNIVERSITY

M.Sc. (Chemistry) Examination, Semester -2 (CBCS)

Thursday,   Date: 19-04-2018

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

Subject Code: PS02ECHE21
Subject Title: Analytical Chemistry

N.B. (1) Figures to the right indicate full marks.   [Total Marks: 70]
(2) Attempt all questions.

Q. 1 Select the correct answer from each of the following: (08)

1. _____ often used for research and pilot studies if time is constrained.
   (a) Prospective validation   (c) Retrospective validation
   (b) Periodical validation   (d) Partial validation

2. Which of the following is not use as detector in UV-Visible spectroscopy?
   (a) Photo tube   (b) Scintillation counter   (c) PMT   (d) Photo cell

3. The closeness of agreement between successive results obtained from heterogeneous conditions with different operators using different equipment is called as _____.
   (a) reproducibility   (b) repeatability   (c) confidence level   (d) Above all

4. Which of the following is example of molecular spectroscopy?
   (a) ICP   (b) AES   (c) NMR   (d) AAS

5. _____ is a process that is used to evaluate whether or not a product, service or system complies with regulation, specification or conditions imposed at the start of a development phase.
   (a) Verification   (b) Quality assurance   (c) both (a) and (b)   (d) None of all

6. Separation of large molecules or particle from smaller ions, under the influence of a electric field is known as _____.
   (a) Ionophoresis   (b) Electrophoresis   (c) Electro-dialysis   (d) None of all

7. Relative standard deviation is often called the _____.
   (a) variance   (b) co-efficient of variation   (c) confidence limit   (d) above all

8. Which factor improves the column efficiency in column chromatography?
   (a) Partition ratio   (c) length/width ratio
   (b) Distribution ratio   (d) Above all

Q. 2 Answer the following: **(Any Seven)**   (14)

   (i)   What is principle of gas solid chromatography (GSC)?

   (ii) Define the terms: Periodical validation and Concurrent validation.

   (iii) What is gradient elution?

   (iv) Discuss the relative molar response for chromatogram.

   (v)   Classify the analytical techniques based on purpose of analysis.

(P.T.O.)

[vi] Enlist the basic components of optical instruments.

[vii] Differentiate: continues source and line source.

[viii] What are the essential elements of quality systems (Q.S)?

[ix] 100 g of water at 25 °C, dissolves 11.3 g of SO_2. Calculate the percentage concentration of resultant solution.

3 [a] Explain how to prepare sample and perform the analysis? (6)

  [b] What is validation? Explain in brief on their various categories. (6)

OR

  [b] Discuss in detail on good manufacturing practices and its components. (6)

4 [a] In an analysis to determine the alcohol content of a liquor by gas chromatography. The alcohol peak areas for each of five injections were 124.5, 119.7, 137.5, 125.9, 124.8. Calculate (a) the standard deviation of the mean (b) the relative standard deviation of the mean (c) co-efficient of variation. (6)

  [b] Answer the following: (6)
    [i] What do you mean by primary standard and secondary standard substance? Explain it.

    [ii] Explain the term statistical analysis and give its applications.

OR

  [b] Discuss in brief on Outlier and methods of its rejection. (6)

5 [a] What is the relation between energy, wavelength and wave number of EMR? Describe the interaction EMR with matter. (6)

  [b] Explain the function of wavelength selector? Discuss the significance of monochromator. (6)

OR

  [b] Explain in brief on typical absorption and emission spectrometer and detectors used in it. (6)

6 [a] Answer the following: (6)
    [i] Define the term chromatography. Give the classification of chromatography based on adsorption and partition phenomenon.

    [ii] Discuss on various adsorbents used in TLC and detail account on various methods for preparation of thin layer on plates.

  [b] Why GLC is superior than GSC? Discuss various development techniques. (6)

OR

  [b] Explain the 'Rate and plate theory'. Discuss its significance. (6)

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