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Reg. No. : .....

Name : .....

Fourth Semester M.Sc. Degree Examination, September 2019

Analytical Chemistry

CL 242 – APPLIED ANALYTICAL CHEMISTRY

(2016 Admission Onwards)

Time : 3 Hours Maximum Marks : 75

SECTION – A

Answer **any two** among (a, b, c) from each question.
Each sub-question carries **2** marks

1. (a) Discuss the phenomena of fronting and tailing of chromatographic peaks mentioning the probable causes.

   (b) Define retention factor and mention its significance.

   (c) Outline the principle of dialysis.

2. (a) Explain the principle of dynamic mechanical analysis.

   (b) Mention the applications of neutron activation analysis.

   (c) Distinguish between DTA and DTG based on working principle.

3. (a) Define rancidity.

   (b) Mention the physiological effects of morphine.

   (c) Define iodine value and mention its significance.

P.T.O.

4. (a) Discuss the major nonradiative relaxation methods.

(b) List the advantages of electrothermal atomizers.

(c) Mention the principle of X-ray fluorescence spectroscopy.

5. (a) Outline the determination of dissolved oxygen and mention its significance.

(b) List the biological significance of pepsin and tyrosinase.

(c) Discuss the principle of estimation of CO_2 in alcoholic beverages.

(10 × 2 = 20 Marks)

SECTION – B

Answer **either** (a) or (b) from each question. Each question carries **5** marks

6. (a) Give a brief account of the different types of stationary phases in gas chromatography.

(b) Briefly discuss the different types of precolumns in HPLC.

7. (a) Explain the application of radiometric titrations in estimation of ions in a mixture.

(b) Discuss the principle and applications of thermometric titrations.

8. (a) Outline the methodology for analyzing milk samples for their fat and water content.

(b) Explain the significance and methods for the estimation of saponification value and iodine value.

9. (a) Explain the utility of fluorimetry in detection of inorganic cations and organic/biochemical species.

(b) Explain the functioning of hollow cathode lamp.

10. (a) Discuss briefly the classical and modern methods of drug analysis

(b) Provide a brief account of the analysis of analgesics.

(5 × 5 = 25 Marks)

SECTION – C

Answer **any three** questions. Each question carries **10** marks

11. (a) Briefly outline the principle of solvent extraction with special mention to inorganic species.

(b) Outline the salient features of FID and TCD detectors in gas chromatography. (5 + 5 =10)

12. Discuss the basic theory and instrumentation of TG, DTA and DSC.

13. Provide a discussion on the classification of poisons. Outline the mode of action of cyanides and organophosphates and the forensic analysis of the same.

14. Discuss the basic theory, instrumentation and applications of XPS.

15. Elaborate on the principles and procedures for estimation of biological fluids

(3 × 10 = 30 Marks)

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