647510 **23MSC1AnaC104x** **Seat No :_____**

M.Sc.(Chem.) Semester - 1 (*CBCS*) Examination
OCT/NOV-2024 (AS PER SYLLABUS YEAR JUNE-2023)
Analytical Chemistry (Core (New-23))

Time: 2:30 Hours **Marks: 70**

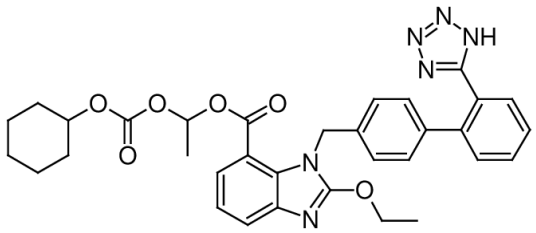
Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Q.1 (a) **Answer the following question** **(04)**

(1) How would you prepare 100 mL of a 10 ppm solution of aspirin in methanol?

(2) Write empirical formula and calculate molecular weight:



Q.1 (b) **Answer any two questions out of three.** **(10)**

(1) Define Molarity and explain preparation of following buffers in DM water: (A) 500 mL of 0.1 M hydrochloric acid and (B) 1000 mL 20 mM sulfuric acid.

(2) Define Analytical Chemistry and differentiate between classical methods and modern Instrumental methods.

(3) Explain mole concept and find the number of moles present in 196 gm of H_2SO_4.

Q.2 (a) **Answer the following question** **(04)**

(1) Explain refraction and refractive index with figure.

Q.2 (b) **Answer any two questions out of three.** **(10)**

(1) Write a note on immersion refractometer with figure.

(2) Give the process for calibration of polarimeter

(3) Discuss instrumentation of polarimeter with diagram.

Q.3 (a) **Answer the following question** **(04)**

(1) Explain Mohr's method and its limitation.

Q.3 (b) **Answer any two questions out of three.** **(10)**

(1) Write a note on Fajan's method for estimation of chloride.

(2) Explain types of Ligands with example used in complexometric titration.

(3) Give classification of volumetric titration and enlist the basic requirements of volumetric methods.

Q4 (A) **Answer the following questions** **(04)**

(1) Write twelve principles of green chemistry.

Q4 (B) **Answer any two questions out of three** **(10)**

(1) Explain atom economy with suitable example.

(2) Discuss synthesis of Ibuprofen in classic route and green route.

(3) Write a note on global carbon cycling and resource depletion

Q.5 (a) **Answer the following question** **(04)**

(1) Explain glass transition temperature in brief.

(2) Name various thermocouples used in DSC.

Q.5 (b) **Answer any two questions out of three.** **(10)**

(1) Write a note on factors influencing TGA and DTA analysis.

(2) Give the principle and working of DSC apparatus.

(3) Give principle of TGA and discuss TGA thermogram of $CuSO_4.5H_2O$.

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