

**M.Sc.(Chem.) Semester - 1 (CBCS) Examination**  
**Nov/Dec-2023 (SYLLABUS YEAR JUNE-2018)**  
**ANALYTICAL CHEMISTRY(CORE)**

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

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

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- Q.1 (A) Answer the following question (04)**  
(1) Give any four examples of hyphenated techniques.  
(2) What is gravimetric analysis?
- Q.1 (B) Answer any two questions out of three. (10)**  
(1) Define analytical chemistry and differentiate between classical and modern analytical methods.  
(2) Broadly discuss the classification of analytical methods.  
(3) Enlist limitations of classical methods and instrumental methods.
- Q.2 (A) Answer the following question (04)**  
(1) Explain Mole concept in brief with example
- Q.2 (B) Answer any two questions out of three. (10)**  
(1) What is equivalent weight? Give its equations and write at-least one examples of mono, di and tri basic acid and mono, di and tri acidic base including molecular weight and equivalent weight.  
(2) Calculate the mole fraction for potassium hydroxide and water for the solution containing 50 gm potassium hydroxide in 200 mL of water.  
(3) How will you prepare following solutions?  
a) 100 mL, 25% w/v acetic acid in water  
b) 100 mL, 25 ppm acetic acid in water  
c) 1L, 1.5M acetic acid in water
- Q.3 (A) Answer the following question (04)**  
(1) Briefly explain the classification of volumetric titration.
- Q.3 (B) Answer any two questions out of three. (10)**  
(1) Write a note on Fajan's method for estimation of chloride.  
(2) Briefly explain the factor affecting on end point detection  
(3) Discuss the volhard method for detection of halogens.
- Q.4 (A) Answer the following question (04)**  
(1) Write a note on organic and inorganic water pollutants.
- Q.4 (B) Answer any two questions out of three. (10)**  
(1) What are particulate matters? Discuss its role in pollution.  
(2) What is atmosphere? briefly introduce various layers of atmosphere.  
(3) What is acid rain? Discuss its occurrence and effects.
- Q.5 (A) Answer the following question (04)**  
(1) Write in brief about the analysis of nitrate and nitrite in water.
- Q.5 (B) Answer any two questions out of three. (10)**  
(1) What is Dissolved Oxygen? Discuss Winkler's method for estimation of Dissolved Oxygen.  
(2) Discuss Mohr's method for estimation of chloride in water.  
(3) What is hardness of water? How will you determine the hardness of water?

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