

## M.Sc.(Chem.) Semester - 1 (CBCS) Examination

Nov/Dec - 2022 [NEW COURSE]

## ANALYTICAL CHEMISTRY(CORE)

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 (04)**

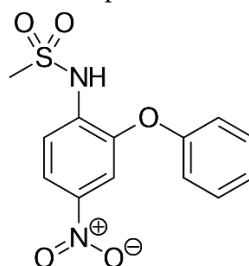
- (1) Define the term analytical chemistry and write the basic objectives of analytical chemistry.
- (2) Explain classification of wet chemical analysis in brief.

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

- (1) Discuss in detail: classification of modern analytical techniques.
- (2) Define calibration and discuss calibration of pH meter in detail.
- (3) What is sampling? explain about solid and liquid samplers with diagram.

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

- (1) Give molecular and equivalent weights of sulfuric acid and phosphoric acid.
- (2) Calculate molecular weight and write empirical formula for given compound.

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

- (1) Find the weight of solute (mg) in following solutions.  
1 L, 3500 ppm atorvastatin in acetonitrile.  
250 mL, 75 ppm ciprofloxacin in methanol.  
1.5 Lit, 5% v/w aq. solution of acetic acid  
300 mL, 15% w/w sodium hydroxide in water  
2M, 900 mL aq. solution of acetic acid
- (2) Discuss the concept of Mole with example.
- (3) Define molarity and find the moles present in  
200 gm nitric acid and 7 gm oxalic acid

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

- (1) Classify of indicators with suitable examples  
(Minimum 2 examples in each class)

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

- (1) Discuss classification of volumetric titrations in detail.
- (2) Discuss the factors affecting the end point detection.
- (3) Write a note on complexometric titration with example.

**Q.4 (a) Answer the following. (04)**

- (1) Explain troposphere in brief.
- (2) Discuss reactions of CO and CO<sub>2</sub> in atmosphere.

**Q.4 (b) Answer any two questions out of three. (10)**

- (1) Discuss about particles, ions, and radicals in atmosphere.
- (2) Write a detail note on particulates.
- (3) Discuss the classification of water pollution.

**Q.5 (a) Answer the following (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) Explain various method for analysis of H<sub>2</sub>S in air.
- (2) What is hardness of water? How will you determine the hardness of water?
- (3) Discuss the method for analysis of dissolve oxygen (DO) in water.

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