K23U 1981

Reg. No. : .....

Name : .....

II Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/ Improvement) Examination, April 2023
(2019 Admission Onwards)
CORE COURSE IN CHEMISTRY
2B03CHE : Analytical and Inorganic Chemistry – I

Time : 3 Hours Max. Marks : 40

***Instruction** : Answer the questions in **English** only.*

SECTION – A

Very short answer type. **Each** carries **1** mark. Answer **all 4** questions.

1. How many significant figures are present in the measurement of 0.0020 kg of a substance ?
2. Define Molality of a solution.
3. Arrange the following compounds in the increasing order of their solubility in water. NaOH, LiOH, RbOH, KOH, CsOH.
4. Give one example each for an acid and a base according to the Lux-Flood concept. **(4×1=4)**

SECTION – B

Short answer type. **Each** carries **2** marks. Answer **7** questions out of 10.

5. Differentiate between precision and accuracy.
6. What do you mean by confidence limit of a measurement ?
7. What are alkaline earth metals ? Why are they so called ?
8. Explain inert-pair effect with an example.

P.T.O.

9. Explain with possible reasons how the atomic radius of elements in group 16 of the periodic table of elements varies from top to bottom.
10. Describe Lewis concept of acid and base with suitable examples.
11. What is meant by redox indicator ? Give an example each for internal and external redox indicators.
12. What do you mean by primary standard ? Give an example each of a base and an acid that are primary standards.
13. Define common ion effect. How is it applied to selectively precipitate Al as its hydroxide in the presence of Zn ?
14. Explain leveling effect of solvents. **(7×2=14)**

SECTION – C

Short essay type. **Each** carries **3** marks. Answer **4** questions out of 6.

15. The following set of chloride determinations on separate aliquots of a pooled serum were reported : 103, 106, 107 and 114 meq/L. One value appears suspect. Explain how you will determine whether this value can be rejected, at the 95% confidence level. The tabulated Q value for four observations is 0.829 for 95% confidence level.
16. Explain complexometric titration taking EDTA as an example.
17. What are the important isotopes of hydrogen ? Explain ortho and para hydrogen.
18. Write a brief note on the oxoacids of nitrogen.
19. Describe the use of liquid ammonia as a non-aqueous solvent.
20. Explain how the relative strength of acids are compared. If A, B and C are three acids with acid dissociation constants (K_a) 1.8×10^{-5}, 4.6×10^{-4} and 1.2×10^{-2} respectively, arrange them in the increasing order of acid strength. **(4×3=12)**

SECTION – D

Long essay type. **Each** carries **5** marks. Answer **2** questions out of 4.

21. a) Explain standard deviation and relative standard deviation in a measurement.
    b) Calculate the average, standard deviation and relative standard deviation of the following 4 measurements 51.3, 55.6, 49.9 and 52.0.
22. Give a brief account of the oxides, halides and hydrides of alkali metals. Account for the formation of different type of oxides by different alkali metals.
23. In the p-block of the periodic table elements in the second period show exceptional behaviour. Illustrate and explain the reason for this behaviour.
24. Briefly explain HSAB principle and its applications. **(2×5=10)**

———————