

K21P 0519

Reg. No.:

Name :

**First Semester M.Sc. Degree (CBSS – Reg./Suppl. (Including Mercy
Chance)/Imp.) Examination, October 2020
(2014 Admission Onwards)
CHEMISTRY
CHE 1C. 02 : Inorganic Chemistry – I**

Time : 3 Hours

Max. Marks : 60

SECTION – A

Answer **all** questions in **one** word or **one** sentence. **Each** question carries **1** mark.

1. What is meant by median value ?
2. Name an organic precipitant used in the gravimetric estimation of nickel (II) from its solution.
3. Give one example each for protic and aprotic solvent.
4. Identify the conjugate bases of $\text{Si}(\text{OH})_4$ and H_2PO_4 .
5. Give one example for radioactive electron capture reaction.
6. Why do lighter elements generally undergo fusion while heavier elements show nuclear fission ?
7. Classify the following boranes into closo/nido/arachno structure :
a) B_5H_9 b) $\text{C}_2\text{B}_{10}\text{H}_{12}$
8. How is polythiazyl prepared ? (8×1=8)

SECTION – B

Answer **any eight** questions. Answer may be in **two** or **three** sentences. **Each** question carries **2** marks.

9. Explain the significance of students t-test.

P.T.O.

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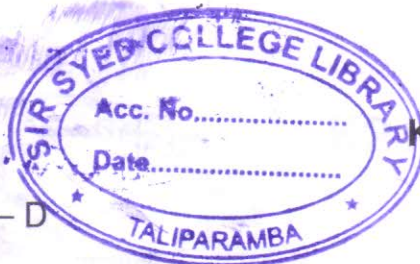


10. What do you mean by precipitation from homogeneous solution ? Explain with an example.
11. Calculate the standard deviation for the following set of analytical data for a sample A : 13.68 mg, 13.70 mg, 13.04 mg, 13.14 mg.
12. Explain the Bronsted-Lowry concept of acids and bases.
13. An acid that is weak in water may appear strong in a solvent that is a strong proton acceptor. Explain.
14. What is symbiosis ? Explain with an example.
15. What is average life of a radioactive element ? How is it related to its half-life ?
16. How do spallation reactions differ from fission reactions ?
17. What is meant by Q-value of a nuclear reaction ? How is it calculated ?
18. The styx code for a boron hydride is 1104. Draw its topological structure.
19. How does diborane react with : a) CO b) PH_3 .
20. How is P_4S_{10} prepared ? Draw its structure. (8×2=16)

SECTION – C

Short paragraph questions. Answer **any four** questions. **Each** question carries **3** marks.

21. Differentiate between co-precipitation and post precipitation giving suitable example.
22. How errors are classified ?
23. What are hard and soft acids and bases ?
24. Write a note on hydrometallurgy.
25. Briefly discuss the Fermi gas model of nucleus.
26. Differentiate between transient equilibrium and secular equilibrium.
27. Give an account of the synthesis, properties and structure of tetrasulphur tetranitride.
28. How is 1,2-dicarba-closo dodecacarborane (12) synthesised ? What happens when it is heated ? (4×3=12)



Essay type questions. Answer **four** questions. **Each** question carries **6** marks.

29. A) Discuss the use of oxine, cupferron and dimethylglyoxime in inorganic analysis.

OR

- B) Give an account of the different types of solvent systems used in solvent extraction.

30. A) Give an account of the classification of solvents. Discuss the role of molten salts as non-aqueous solvent system.

OR

- B) Discuss the role of H_2SO_4 as a non-aqueous solvent. What are its advantages and disadvantages?

31. A) Categorise the various types of nuclear reactions on the basis of the nature of bombarding particles. Mention their advantages and disadvantages.

OR

- B) Describe the principle and working of GM counter. What are its merits and demerits?

32. A) How is triphosponitrilic chloride prepared? Give an account of its properties, structure and bonding.

OR

- B) Explain closo/nido/arachno structures of boranes with suitable examples.

(4×6=24)