

17P113

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Name: .....

Reg. No. ....

**FIRST SEMESTER M.Sc. DEGREE EXAMINATION, DECEMBER 2017**

(Regular/Supplementary/Improvement)

(CUCSS-PG)

**CC15P CHI C02 – ELEMENTARY INORGANIC CHEMISTRY**

(Chemistry)

(2015 Admission onwards)

Time: Three Hours

Maximum: 36 Weightage

**PART - A**

Answer *all* questions. Each question has 1 weightage.

1. Give examples for two isostructural molecules and two isoelectronic ions.
2. Dimethyl ether and ethanol both have same molecular formula. Which one will be having higher boiling point? Substantiate your answer.
3. Arrange the following in the increasing order of acid strength  
a)  $\text{BCl}_3$ ,  $\text{BI}_3$ ,  $\text{BF}_3$     b)  $\text{SnCl}_4$ ,  $\text{SnCl}_2$
4.  $\text{B}_2\text{O}_3$  is acidic,  $\text{Al}_2\text{O}_3$  is amphoteric and  $\text{Se}_2\text{O}_3$  is basic. Explain?
5. State and explain Wade's rule.
6. Complete the following reactions.  
a)  $\text{B}_2\text{H}_6 + \text{NH}_3 \longrightarrow$   
b)  $\text{B}_2\text{H}_6 + \text{Me}_3\text{N} \longrightarrow$
7. What are phosphazines? Draw the structure of Hexa Chloro Cyclo triphosphazine.
8. Give the structure and synthesis of  $\text{P}_4\text{S}_{10}$
9. What are the structures exhibited by  $\text{P}_4\text{N}_4\text{X}_8$ ?
10. Explain Latimer diagrams?
11. What are the informations given by a Frost diagram?
12. Explain hydroboration reaction?

(12 x 1 = 12 weightage)

**PART -B**

Answer any *eight* questions. Each question carries 2 weightage.

13. Write down the Drago-wayland equation and explain the terms
14. Give an account of the classification of carbides giving suitable example for each type.
15. Briefly explain Walsh diagram.
16. Explain electro neutrality principle with examples.
17. Find the Styx number of the compound  $\text{B}_4\text{H}_{10}$  and draw its structure
18. Give three examples for allotropic forms for each phosphorus and antimony.

19. Discuss the method of preparation of trimeric phosphazene
20. Explain pourbaux diagrams and discuss their applications.
21. Explain Ellingham diagrams. What are its important applications?
22. Give the principles of neutron activation analysis
23. Explain differences in properties of lanthanides and actinides.
24. What is dosimetry? Explain radiation hazards.

(8 x 2 = 16 weightage)

### PART -C

Answer any *two* questions. Each question carries 4 weightage

25. What are silicates? Draw the structure of five different types of silicates. Also give examples for each type of silicates with their formula.
26. Explain HSAB concepts of acids and bases with typical examples. Give definitions for Lux-Flood, Lewis and Usanovich concept of acid and bases giving suitable examples.
27. Give self ionization reaction for the following non-aqueous solvents. a) Liquid  $\text{H}_2\text{SO}_4$   
b) Liquid  $\text{NH}_3$ . c) Liquid  $\text{HF}$  d) Liquid  $\text{SO}_2$ . Compare the properties of these four non-aqueous solvents giving suitable reactions.
28. Explain the structure of heteropoly and isopoly anions of W, Mo, and V. How will the structure of heteropoly acids explain their properties?

(2 x 4 = 8 weightage)

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### PART -B

Answer any eight questions. Each question carries 3 weightage

13. Write down the Drago-wayland equation and explain the terms
14. Give an account of the classification of carbides giving suitable example for each type.
15. Briefly explain Walsh diagram.
16. Explain electro neutrality principle with examples.
17. Find the  $\delta$ yx number of the compound  $\text{B}_4\text{H}_{10}$  and draw its structure
18. Give three examples for allotropic forms for each phosphorus and antimony.

(12 x 1 = 12 weightage)