

Sixth Semester B.Sc. Degree Examination, September 2020

(CBCS Scheme)

Chemistry

Paper VII – INORGANIC CHEMISTRY

Time : 3 Hours]

[Max. Marks : 90

Instructions to Candidates :

- 1) The question paper has two Parts A and B. Both the parts should be answered.
- 2) Write the equations/ diagrams wherever necessary.

PART – A

Answer any **TEN** of the following questions. Each question carries **2** marks :

(10 × 2 = 20)

1. Define Glass transition temperature.
2. Mention any two general properties of Inorganic polymers.
3. What are metallocenes? Give example.
4. State the limitations of EAN rule applied to metal carbonyls.
5. What are fullerenes?
6. Mention the types of fertilizers with an example for each.
7. What are the constituents of an oil paint?
8. State the objectives of coating the surfaces.
9. What is smelting?
10. Give the composition of Brass and Bronze.
11. What are the important requirements of an explosive?
12. How lead azide is prepared?

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PART - B

Answer any **SEVEN** questions. Each question carries **10** marks : **(7 × 10 = 70)**

13. (a) How Boron nitride is prepared from ammonia? Give its structure and applications.
(b) What are silicones? How linear silicone polymers are prepared?
(c) Draw the structure of (i) Zeise's salt (ii) Methyl lithium (iii) Hexacarbonyl chromium. **(4 + 3 + 3)**
14. (a) Explain synergic effects of sigma and Pi bonds with diagrammatic representation in metal carbonyls.
(b) How Nickel tetracarbonyl $[\text{Ni}(\text{CO})_4]$ is prepared? What is the action of sulphuric acid on it?
(c) Apply EAN rule to $\text{Fe}_2(\text{CO})_9$ and explain its stability. **(4 + 3 + 3)**
15. (a) Discuss the structure and bonding of Octacarbonyl di cobalt $[\text{Co}_2(\text{CO})_8]$.
(b) Explain pi (π) - acceptor behaviour of carbon monoxide with reference to molecular orbital diagram.
(c) Write a note on safety glass. **(4 + 3 + 3)**
16. (a) Describe the manufacture of glass.
(b) Write a note on setting of cement.
(c) What are the basic raw materials required for the manufacture of ceramics? Mention the function of each one of them. **(4 + 3 + 3)**
17. (a) How Portland cement is manufactured?
(b) Give the composition and properties of following types of glasses.
(i) Optical glass
(ii) Borosilicate glass
(c) Write a note on heat treatment of steel. **(4 + 3 + 3)**

18. (a) What are mixed fertilizers? Explain the manufacture of urea by Sindri method.

(b) Write a note on NPK fertilizer.

(c) Give the composition of calcium super phosphate. How it is prepared?

(4 + 3 + 3)

19. (a) What are Pigments? Mention the types of pigments. Give an example for each.

(b) Briefly explain plastic paints. Name any two ecofriendly paints.

(c) Write a note on electrolytic metallic coating.

(4 + 3 + 3)

20. (a) What are Ellingham diagrams? Using these diagrams, compare the reducing behaviour of carbon and carbon monoxide for metal oxides.

(b) Briefly explain parting process for the separation of silver from Gold.

(c) Discuss the method of getting ultra pure metals for semiconductor technology.

(4 + 3 + 3)

21. (a) Discuss the general principles of pyrometallurgy.

(b) What are ferrous alloys? How ferrosilicon is manufactured?

(c) Explain the manufacture of steel by Bessenmer's process.

(4 + 3 + 3)

22. (a) What are propellants? Give the classification of propellants with an example.

(b) How cyclonite is prepared? Write the equation.

(c) Mention the special properties acquired by steel by introducing the following elements :

(i) Titanium (ii) Silicon (iii) Manganese.

(4 + 3 + 3)

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