

Part-I

I. Choose the correct answer:

15x1=15

1. The liquid among the following is

- a) F_2 b) Cl_2 c) Br_2 d) I_2

2. The catalytic behaviour of transition metal and their compounds is ascribed mainly due to

- a) their magnetic behaviour b) their unfilled d orbital
c) their ability to adopt variable oxidation state
d) their chemical reactivity

3. The neutral oxide is

- a) NO b) NO_2 c) N_2O_3 d) N_2O_4

4. How many geometrical isomerism are possible for



- a) 3 b) 4 c) 0 d) 15

5. Match the metals with the refining process.

	Column I	Column II	A	B	C	D
A	Ge	i) Liquation	a) iv	ii	iii	i
B	Ni	ii) Distillation	b) iv	iii	ii	i
C	Zn	iii) Mond's process	c) i	ii	iii	iv
D	Pb	iv) Zone refining	d) iv	iii	i	ii

6. Bauxite has the composition

- a) Al_2O_3 b) $Al_2O_3 \cdot nH_2O$ c) $Fe_2O_3 \cdot 2H_2O$ d) None of these

7. The geometry at which carbon atom in diamond are bonded to each other is

- a) tetrahedral b) hexagonal c) octahedral d) None of these

8. Which of the following is strongest acid among all?

- a) HI b) HF c) HBr d) HCl

9. Permanganate ion changes to _____ in acidic medium.

- a) MnO_4^{2-} b) Mn^{2+} c) Mn^{3+} d) MnO_2

10. Graphite and diamond are _____.

- a) covalent and molecular crystal
b) ionic and covalent crystal
c) both covalent crystal d) both molecular crystal

11. The half life period of a radioactive element is 140 days. After 560 days, 1g of element will be reduced to _____.

- a) $\frac{1}{2}$ g b) $\frac{1}{4}$ g c) $\frac{1}{8}$ g d) $\frac{1}{16}$ g

12. In photography the film is washed with _____ solution.

- a) sodium bisulphate b) sodium thio sulphate
c) sodium sulphate d) None of these

13. The shape of XeF_4 is _____.

- a) Square planar b) T shaped c) Pyramidal d) both a & b

14. $3B_2H_6 + 2NH_3 \rightarrow ?$

- a) $2B_3N_3H_6$ b) $B_3N_3H_6$ c) $B_2N_2H_6$ d) $B_4N_4H_8$

15. Which is true regarding Nitrogen?

- a) Nessler's reagent b) Tollen's reagent
c) Reagent for analysis of IV group basic radical
d) Reagent for analysis of III group basic radical

Part-II

Answer any six questions and question No.24 is compulsory:

6x2=12

16. Why we add NaCN in froth flotation method?

17. Write the test for sulphate and sulphuric acid.

18. What is Activation Energy?

19. Differentiate Linkage and Ionisation Isomer.

20. What is Isotropy and Anisotropy?

21. Derive Bragg's Equation.
22. Mention the uses of Helium and Argon.
23. Differentiate double salt and co-ordination isomer.
24. A face centered cubic solid of an element (atomic mass 60g/mol) has a cube edge of $4A^0$ calculate its density.

Part-II

Answer any six questions and question No.33 is compulsory:

6x3=18

25. Explain the electro metallurgy of aluminium.
26. Write a note on chromyl chloride test.
27. Give the structure of diborane.
28. Differentiate Amorphous and crystalline solid.
29. Write limitations of valence bond theory.
30. Transitional elements exhibit variable oxidation state. Why?
31. Write the structure of PCl_5 and IF_7 .
32. What is leaching? Write any two types of leaching.
33. A first order reaction is 40% complete in 50 minutes. Calculate the value of rate constant. In what time will the reaction be 80% complete?

Part-IV

Answer all the questions:

5x5=25

34. a) i) Mention the rate of lime stone in smelting. (3)
 ii) List the limitations of Ellingham diagram. (2)
- (or)
- b) i) Write the equations of Mcfee and Fischer's troph synthesis. (3)
 ii) List the uses of silicones. (2)

35. a) i) What is Holme's signal? (3)
 ii) Explain Deacon's process. (2)

(or)

- b) i) Explain the preparation of KMnO_4 . (2)
 ii) Differentiate Lanthanoid and Actinoid. (3)

36. a) Write the postulates of Werner's theory.

(or)

- b) i) What is scholtky defect? (2)
 ii) Calculate the packing efficiency of Bcc. (3)

37. a) Explain Arrhenius equation – the effect of temperature on reaction rate.

(or)

- b) i) Write the IUPAC names of: (3)

a) $[\text{Ag}(\text{CN})_2]^-$ b) $[\text{Pt}(\text{NH}_3)_2\text{Cl NO}_2]$ c) $\text{Na}_2[\text{Ni}(\text{EDTA})]$

- ii) Explain why compounds of Cu^{2+} is coloured but those of Zn^{2+} is colorless. (2)

38. a) i) Explain zone refining process. (3)

- ii) How will you identify borate radical? (2)

(or)

- b) i) Define pseudo first order reaction. Give one example.(3)

- ii) Preparation of PH_3 in laboratory method. (2)