



Date: 04-04-2019

Dept. No.

Max. : 100 Marks

Time: 01:00-04:00

PART A

ANSWER ALL QUESTIONS

(10x 2 = 20)

1. Why are ionic compounds more stable than covalent compounds?
2. Mention the factors responsible for the stability of ionic compounds?
3. What is a Unit cell?
4. Write the mathematical expression of Bragg's law and explain the terms in it?
5. Draw the hydrogen-bonding pattern in acetic acid and hydrofluoric acid.
6. What are London Dispersion forces?
7. Mention the colours of the oxides of alkali metals.
8. What is the action of i) lithium with nitrogen ii) magnesium with nitrogen
9. Distinguish quartz from glass.
10. Draw the structure of phosphoric acid and phosphorus acid.

PART B

ANSWER ANY EIGHT QUESTIONS

(8 x 5 = 40)

11. Write a note on Fajan's rule.
12. What are the factors affecting Lattice energy?
13. Draw the structure of the following unit cell a) BCC b) FCC.
14. Mention the coordination number and the preferred hole geometry of wurtzite and caesium chloride and zinc blende.
15. Write a note on Stoichiometric defects in solids.
16. a) What are clathrates of noble gases? b) Why do helium and neon not form clathrates?
17. Distinguish intramolecular from intermolecular hydrogen-bonding.
18. Mention any five differences between lithium and the other Group 1 elements.
19. Explain the function of sodium-potassium Pump.
20. How are carbides classified?
21. How are boranes classified? Provide an example for each type.
22. Mention the name and oxidation number of nitrogen in N_2O , N_2O_3 and N_2O_4 .

PART C

ANSWER ANY FOUR QUESTIONS

(10 x 4 = 40)

23. a) Write a note on the classification of silicates based on their structural framework of Si-O-Si linkage.

b) a) Write a note on the chemical properties of the elements belonging to nitrogen family.

(5+5)

24. a) Draw the structures of diborane and pentaborane-9.

b) Provide one method of preparation of diborane and elucidate that the molecule

behaves like a Lewis acid as well as a Lewis base.

(4+6)

25. Explain the characteristics of group 1 metals when it reacts with i) water ii) molecular oxygen. Explain the nature of the oxides formed by the alkali and alkaline earth metals.

26. a) Write the chemical formula of the following. i) orthophosphoric acid ii) nitrous acid
iii) pyrophosphoric acid.

b) Explain the variation in the boiling point of the hydrides of nitrogen family. **(5+5)**

27. Sketch and explain the structure of sodium chloride and caesium chloride.

28. How is the lattice energy of NaCl determined by Born-Haber cycle?

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