2017

(5th Semester)

CHEMISTRY

SIXTH PAPER (CHEM–352)

(Inorganic Chemistry—II)

Full Marks : 55

Time : 2½ hours

(PART : B—DESCRIPTIVE)

(*Marks* : 35)

The figures in the margin indicate full marks for the questions

1. *(a)* Define radius ratio rule. 1

(b) Explain Born-Haber cycle. 3

(c) Discuss briefly the factors affecting the magnitude of lattice energy. 3

OR

2. *(a)* Define solvation energy. 1

(b) Discuss Frenkel defects giving suitable example. 3

(c) Define *p*-type and *n*-type semiconductors giving suitable examples. 3

3. *(a)* What is the bond order for H_2 molecule? 1

(b) What are the necessary conditions for the combination of atomic orbitals to form molecular orbitals? 3

(c) Draw the MO diagram of CO and calculate the bond order. 3

OR

4. *(a)* Define van der Waals' forces. 1

(b) Explain with suitable example dipole-induced dipole interaction. 3

(c) Draw the MO diagram of N_2. 3

5. *(a)* Define catenation. 1

(b) Discuss the different types of interhalogen compounds. 3

(c) Describe briefly the separation of noble gases by fractionalization of liquid air. 3

OR

6. *(a)* What do you understand by inert pair effect? 1

(b) Discuss the formation of clathrates with suitable example. 3

(c) Explain the structure of XeF_6. 3

7. *(a)* Define Bronsted-Lowry concept of acid. 1

(b) Illustrate the solvolysis reaction in liquid ammonia. 3

(c) Define acids and bases on the basis of solvent system concept giving suitable examples. 3

OR

8. *(a)* Give one example of complex formation reaction shown by ammono base in liquid ammonia. 1

(b) Evaluate the symmetry elements and symmetry point group of NH_3. 3

(c) Discuss in brief the classification of cations and anions based on HSAB principle. 3

9. *(a)* What is inner sphere complex? 1

(b) Discuss the characteristics of first row transition elements for the ability to form complexes and the magnetic properties. 4

(c) Why is $[Cr(NH_3)_6]^{3+}$ paramagnetic? Explain in brief. 2

OR

10. *(a)* Explain why *d*-block elements are called transition elements. 1

(b) Discuss the factors affecting the magnitude of CFSE. 3

(c) Draw and explain the crystal field splitting pattern in octahedral geometry. 3

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Subject Code : CHEM/V/06

Booklet No. A

Date Stamp .....

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To be filled in by the Candidate

DEGREE 5th Semester
(Arts / Science / Commerce / .....) Exam., **2017**

Subject .....
Paper .....

INSTRUCTIONS TO CANDIDATES

1. **The Booklet No. of this script should be quoted in the answer script meant for descriptive type questions and vice versa.**
2. **This paper should be ANSWERED FIRST and submitted within** *45 minutes* **of the commencement of the Examination.**
3. **While answering the questions of this booklet, any cutting, erasing, over-writing or furnishing more than one answer is prohibited. Any rough work, if required, should be done only on the main Answer Book. Instructions given in each question should be followed for answering that question only.**

To be filled in by the Candidate

DEGREE 5th Semester
(Arts / Science / Commerce / .....) Exam., **2017**

Roll No. .....
Regn. No. .....

Subject .....
Paper .....

Descriptive Type
Booklet No. B .....

Signature of Scrutiniser(s) *Signature of Examiner(s)* *Signature of Invigilator(s)*

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2017

(5th Semester)

CHEMISTRY

SIXTH PAPER (CHEM–352)

(Inorganic Chemistry—II)

(PART : A—OBJECTIVE)

(*Marks* : 20)

The figures in the margin indicate full marks for the questions

SECTION—I

(*Marks* : 5)

Put a Tick (✓) mark against the correct answer in the brackets provided : 1×5=5

1. The crystal structure of NaCl is

(a) simple cubic lattice ( )

(b) face-centred cubic lattice ( )

(c) body-centred cubic lattice ( )

(d) disordered cubic lattice ( )

2. The Bond order of He_2 is

(a) 1 ( )

(b) 2 ( )

(c) 3 ( )

(d) 0 ( )

3. Caro's acid is

(a) H_2SO_4 ( )

(b) H_2SO_5 ( )

(c) $H_2S_2O_8$ ( )

(d) $H_2S_2O_7$ ( )

4. The symmetry point group of BF_3 is

(a) D_{3h} ( )

(b) D_{3v} ( )

(c) C_{3v} ( )

(d) C_3 ( )

5. $Fe[(H_2O)_6]^{2+}$ is

(a) outer orbital complex ( )

(b) inner orbital complex ( )

(c) neutral complex ( )

(d) None of the above ( )

SECTION—II

(*Marks* : 15)

Answer the following questions : 3×5=15

1. Explain in brief the Schottky defect.

2. Discuss the band theory of conductors and insulators.

3. Discuss the ionic or covalent characters of alkaline earth metal hydrides.

4. Why tetrahalides of carbon do not behave as Lewis acids while tetrahalides of other elements of group 14 are Lewis acids?

5. Discuss the stability of transition metal complex.

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