



Seat No.:

No. of Printed Pages: 02

[130/A-20]
Eng.

SARDAR PATEL UNIVERSITY
B. Sc. (SEMESTER-V) EXAMINATION
Subject: Inorganic Chemistry (US05CCHE22)

Date: 24-11-2021

Time: 03:00 P.M. To 05:00 P.M.

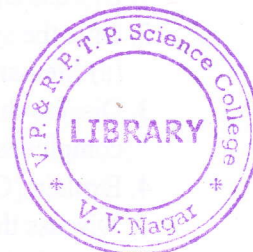
Day: Wednesday

Total Marks: 70

Q:1 Answer the following multiple-choice questions.

[10]

- Which is the principal axis of rotation present in benzene molecule ?
(a) C_6 (b) C_4 (c) C_3 (d) C_2
- Point group of BCl_3 molecule is _____
(a) C_{3v} (b) D_{2h} (c) D_{3h} (d) C_{3h}
- How many two-fold axis of rotation present in cyclobutene molecule ?
(a) 1 (b) 2 (c) 3 (d) 4
- CN^- is a _____ field ligand.
(a) strong (b) weak (c) bidentate (d) octahedral
- Which orbital is very important in CFT ?
(a) s (b) p (c) d (d) f
- The complexes in which the ligand substitution is fast are called _____ complexes.
(a) inert (b) parallel (c) octahedral (d) labile
- S_N1 is known as _____ mechanism.
(a) dissociation (b) association (c) both (a) & (b) (d) none of these
- Greater stability of chelated complexes is called.....
(a) lability (b) stability (c) chelate effect (d) none of these
- The molecular formula of inorganic rubber is _____.
(a) $[NPCI]_n$ (b) $N_3P_3(NH_2)_6$ (c) $(N_4P_4Cl_8)$ (d) $[NPCI_2]_nPCL_5$
- How many isomers of $S_6(NH)_2$ is possible?
(a) 2 (b) 3 (c) 4 (d) 5



Q:2 Fill in the blanks selecting the appropriate option given in the bracket:

[08]

- The plane of reflection perpendicular to the principal axis is called _____ plane.
(horizontal / vertical)
- _____ molecule has an infinite fold axis of symmetry. (Tetrahedral / Linear)
- In octahedral ligand field _____ d -orbital possesses less energy. (t_{2g} / e_g)
- The number of unpaired electron present in $[Co(NH_3)_6]^{3+}$ is _____. (one / zero)
- _____ classified the complexes into labile and inert complexes. (Taube / Charles)
- The ability of a complex to replace its one or more ligands is called its _____
(stability / lability)
- Imides of sulphur can be represented by general formula _____.
($S_n(NH)_{8-n}$ / $S_{n-8}(NH)_n$)
- _____ is not monomer of silicones. ($RSi(OH)_3$ / $C_6H_5SiCl_3$)

Q:3 Short Answer Questions (Attempt Any Ten):

[20]

- Construct the multiplication table for C_{3v} point group.
- Draw the diagram to show that : $S_2 = i$
- Define: (a) Improper rotation (b) Identity operation.
- Write note on spectrochemical series.
- Define crystal field stabilization energy and mean pairing energy.

6. How the geometry of complex ion affected in the magnitude of Δ_0 ?
7. Give the limitations of Job's method.
8. Explain macrocyclic effect.
9. Mention factors affecting the stability of complexes depends on nature of ligand.
10. Give the uses of silicones.
11. Give the general properties of inorganic polymers.
12. What is nitride of sulphur?

Q:4 Long Answer Questions (Attempt Any Four):

[32]

1. Discuss D_{nh} and D_{nd} point group with proper example.
2. Give the symmetry elements and point group present in following:
(a) Methane (b) SF_6 (c) HCl (d) SO_2
3. Discuss the distribution of d^n electrons in high spin and low spin octahedral complexes.
4. Explain $[CoF_6]^{3-}$ ion giving M.O. energy level diagram.
5. Discuss the factors affecting the stability of complexes depends on properties of central metal ion.
6. What is Acid Hydrolysis? Explain the mechanism of acid hydrolysis of octahedral complexes in which the inert ligand is a π - acceptor.
7. Give the preparation, properties and structure of Borazine.
8. Give the preparation, properties and structure of Tetrasulphur tetranitride, S_4N_4 .

