



A Charutar Vidya Mandal's Institution
V.P. & R.P.T.P. SCIENCE COLLEGE
(AUTONOMOUS) (Grant-in-Aid)
Affiliated to Sardar Patel University
VALLABH VIDYANAGAR-388120



Bachelor of Science (Semester 3) Internal Examination - 2025
US03MACHE01: Inorganic Chemistry

Date: 23-09-2025

Time: 2:45 pm to 4:15 pm

Total marks :30

Q-1 Chose the correct answer from the given options.

(6)

(i) The interaction between Ag^+ and I^- is considered:

- (a) Soft-soft (b) Hard-hard (c) Hard-soft (d) Borderline

(ii) Which of the following acts as a proton donor solvent?

- (a) Liquid NH_3 (b) SO_2 (c) H_2O (d) Both A and C

(iii) Inner orbital complexes are generally:

- (a) High spin (b) Low spin (c) Paramagnetic (d) Colored

(iv) _____ element has $[\text{Rn}]5f^3 6d^1 7s^2$ electronic configuration in its ground state.

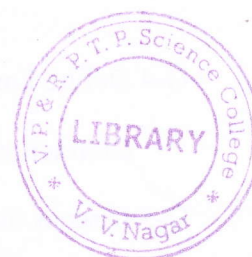
- (a) Californium (b) Uranium (c) Nobelium (d) Neptunium

(v) The number of bridging carbonyl groups present in $[\text{Co}_2(\text{CO})_8]$ and $[\text{Fe}_2(\text{CO})_9]$ is _____ respectively.

- (a) 3 and 2 (b) 1 and 2 (c) 2 and 1 (d) 2 and 3

(vi) In a terminal M-C-O group the CO donates _____ electrons to an empty metal orbitals.

- (a) 1 (b) 0 (c) 2 (d) 3



Q-2 What are hard and soft bases? Explain HSAB principle with suitable examples. (6)

OR

Q-2 Discuss acid base, redox and metathetical reaction takes place in liquid NH_3 . (6)

Q-3 Discuss the shape, hybridization and magnetic property of Ferrocyanide ion $[\text{Fe}(\text{CN})_6]^{4-}$. (6)

OR

Q-3 Give the occurrence of aluminium and write note on electrolysis of fused alumina. (6)

Q-4 Define Actinides, give their name, symbol, atomic number and electronic configuration of actinides. (6)

OR

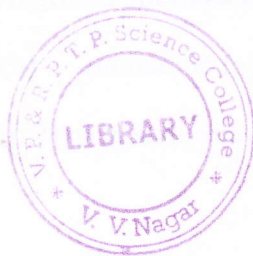
Q-4 Define Lanthanides contraction, give the brief account on consequences of lanthanide contraction. (6)

Q-5 Discuss the structure and M-CO bonding in metal carbonyl. (6)

OR

Q-5 Discuss the preparation, properties, structure and hybridization in $[\text{Fe}_2(\text{CO})_9]$. (6)

*****Best Of Luck*****



No of printed pages: 01

Supervisor sign

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BSc (Semester 3) Quiz - 2025
US03MACHE01: Inorganic chemistry

Date: 23-09-2025 Day: Tuesday

Time: Maximum 20 minutes

Total marks :15

Q-1 Fill in the blanks with appropriate answer given in the bracket.

[08]

- (i) _____ is a hard acid. (H^+ / I^-)
- (ii) _____ is an example of an aprotic solvent. (Water / Sulfur dioxide)
- (iii) The hybridization in $[Cr(NH_3)_6]^{3+}$ is _____. (dsp^2 / d^2sp^3)
- (iv) The impurity removed in Bayer's process is mainly _____. (SiO_2 / Fe_2O_3)
- (v) Most widely used solvent for separation of lanthanides is _____. (TBP / Xylene)
- (vi) _____ species of lanthanides are more stable in aqueous solution.
(Dipositive / Tripositive)
- (vii) $[Fe^{2+}(CN)_5(NO^+)]^{2-}$ has _____ structure. (tetrahedral / octahedral)
- (viii) Nickel tetra carbonyl, $Ni(CO)_4$ molecule is _____. (diamagnetic / paramagnetic)

Q-2 Whether the following statement is true or false? Write your answer in the box.

[07]

- (i) A soft acid usually has high polarizability.
- (ii) A solvent that accepts proton is called aprotic solvent.
- (iii) VBT fails to explain magnetic behavior.
- (iv) The main source of silicon is Silica.
- (v) Xenotime is the richest source of rare earth.
- (vi) $[V(CO)_6]$ metallic carbonyl is not diamagnetic.
- (vii) $[Mn(CO)_5]$ does not obey EAN rule.

