

C.U.SHAH UNIVERSITY

Winter Examination-2018

Subject Name: Inorganic Chemistry-I

Subject Code: 5SC01ICH1

Branch: M.Sc. (Chemistry)

Semester: 1

Date: 26/11/2018

Time: 02:30 To 05:30

Marks: 70

Instructions:

- (1) Use of Programmable calculator and any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

SECTION – I

Q-1 Attempt the Following questions (07)

- a. Write final secular equation for hydrogen molecule ion H_2^+
- b. Find “b” by applying orthogonal condition to Ψ_1 & Ψ_2 . Where, $\Psi_1 = \frac{1}{\sqrt{2}} \Psi_s + \frac{1}{\sqrt{2}} \Psi_p$
and $\Psi_2 = \frac{1}{\sqrt{2}} \Psi_s + b \Psi_p$.
- c. For the $E\Psi = H\Psi$. What is H?
- d. What is magnetic permeability?
- e. What do you mean by magnetic field?
- f. Define curie temperature.
- g. What is the effect of temperature on susceptibility of anti-ferromagnetic substance?

Q-2 Attempt all questions (14)

- a. Explain bond angle in sp^2 hybridization
- b. Explain bond angle in sp hybridization

OR

Q-2 What is Huckel’s π -electron theory? Obtain π_{MO} ’s and energy level diagram for ethylene.

Q-3 Attempt all questions (14)

- a. Explain types of magnetic forms like Paramagnetic substance, ferromagnetic substance and anti-ferromagnetic substance.
- b. What is a diamagnetism? Derive the equation for diamagnetic moment.

OR

- Q-3**
 - a. Explain Russell-saunders coupling (L-S coupling). (14)
 - b. Determination of magnetic susceptibility by Gauy’s method.



SECTION – II

- Q-4 Attempt the Following questions (07)**
- In Mossbauer spectroscopy which kind of ray is absorb by absorber?
 - Why $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$ complex shows Quadrupole splitting?
 - Arrange the following compounds by its isomer shift in increasing order.
 FeBr_2 , FeF_2 , and FeCl_2
 - Who observed Mossbauer spectroscopy first and when?
 - Draw the structure of Aluminon.
 - Write uses of α - nitro- β -naphthol.
 - Give the structure of potassium bromate.
- Q-5 Attempt all questions (14)**
- Describe isomer shift with example.
 - Explain instrumentation of Mossbauer spectroscopy.
- OR**
- Q-5 Attempt all questions (14)**
- Discus basic principle of Mossbauer spectroscopy.
 - Explain Quadrupole splitting and magnetic splitting.
- Q-6 Attempt all questions (14)**
- Describe Ammonium vanadate (NH_4VO_3)
 - Write brief note on cupferron.
- OR**
- Q-6 Attempt all Questions (14)**
- Describe ceric sulphate $[\text{Ce}(\text{SO}_4)_2]$
 - Write brief note on dimethylglyoxime (DMG).

