

C.U.SHAH UNIVERSITY

Summer Examination-2019

Subject Name: Inorganic Chemistry-I

Subject Code: 5SC01ICH1

Branch: M.Sc. (Chemistry)

Semester: 1

Date: 12/03/2019

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^+ (1)
- b. Find “b” by applying normalized condition to Ψ_1 & Ψ_2 . Where, $\Psi_1 = \frac{1}{\sqrt{2}} \Psi_s + \frac{1}{\sqrt{2}} \Psi_p$ (1)
and $\Psi_2 = \frac{1}{\sqrt{2}} \Psi_s + b \Psi_p$.
- c. For the $E\Psi = H\Psi$. What is E? (1)
- d. What is Ferromagnetism? (1)
- e. What do you mean by anti-Ferromagnetism? (1)
- f. Define curie temperature. (1)
- g. What is the effect of temperature on susceptibility of ferromagnetic substance? (1)

Q-2 Attempt all questions (14)

- a. Obtain π_{MO} 's and energy level diagram for ethylene.

OR

Q-2 Attempt all questions (14)

- a. Explain Russell-saunders coupling (L-S coupling). (7)
- b. Explain bond angle in sp hybridization (7)

Q-3 Attempt all questions (14)

- a. Explain types of magnetic forms like Paramagnetic substance, ferromagnetic substance and anti-ferromagnetic substance. (7)
- b. What is a diamagnetism? Derive the equation for diamagnetic moment. (7)

OR

Q-3 a. Explain bond angle in sp^2 hybridization (7)

- b. Determination of magnetic susceptibility by Gauy's method. (7)

SECTION – II

Q-4 Attempt the Following questions (07)

- a. What is recoil energy in Mossbauer spectroscopy? (1)
- b. Why $[Fe(CN)_6]^{2+}$ does not shows quadrupole splitting? (1)



- c. What if s e density increases, isomer shift increases or decreases? (1)
- d. Who is founder of Mossbauer spectroscopy? (1)
- e. Draw the structure of Aluminon. (1)
- f. Write uses of DMG. (1)
- g. Give the structure of Ethylenediamine Tetra Acetic Acid. (1)

Q-5 Attempt all questions (14)

- a. Describe quadrupole splitting with example.
- b. Explain instrumentation of Mossbauer spectroscopy.

OR

Q-5 Attempt all questions (14)

- a. Discuss basic principle of Mossbauer spectroscopy.
- b. Explain magnetic splitting.

Q-6 Attempt all questions (14)

- a. Describe Potassium Iodate (KIO_3) briefly.
- b. Write brief note on salicylaldehyde.

OR

Q-6 Attempt all Questions (14)

- a. Describe Potassium Bromate ($KBrO_3$) briefly.
- b. Write brief note on oxine.

