



P-003-001606

Seat No. _____

Third Year B. Sc. (Sem. VI) (CBCS) Examination

March / April – 2020

Chemistry : Paper - C - 601

(Inorganic & Industrial Chemistry) (Old Course)

Faculty Code : 003

Subject Code : 001606

Time : $2\frac{1}{2}$ Hours]

[Total Marks : **70**

Instructions :

- (1) All the questions are compulsory.
- (2) Question 1 carries 20 marks and Q. 2 and 3 carries 25 marks each.

1 Answer the following questions : 20

- (1) What is multi electron system ?
- (2) Give the ground state spectral term for d^2 case.
- (3) Define – Spin multiplicity.
- (4) What is microstate ?
- (5) What is Hole formalism ?
- (6) What is splitting of D term ?
- (7) “Orgel diagram is applicable only in weak field complexes” – True or False ?
- (8) Define – Larmor Rotation.
- (9) What is permeability value for paramagnetic substance ?
- (10) Define – Magnetic field.
- (11) What is chief ingradient of glass ?
- (12) Define – Glass.
- (13) Which compound is useful to increase the Refractive Index of the glass ?
- (14) Which fatty acids are present in coconut oil ?
- (15) Which glycerides are present in fat ?

- (16) What is amphoteric detergent ?
- (17) Define – Soap.
- (18) Define – Pollution.
- (19) Give the segments of environment.
- (20) What is the main component of stratosphere ?

2 (a) Answer any three of the following : **6**

- (1) Explain S-S coupling.
- (2) Define – Spectral term and Term Symbol.
- (3) Draw the Orgel diagram of D and F term.
- (4) Explain charge symmetric and asymmetric structure of d orbitals.
- (5) Explain Magnetic Induction.
- (6) Write on Ferromagnetic and Antiferromagnetic substances.

(b) Answer any three of the following : **9**

- (1) Write short note – Russel Saundar's coupling.
- (2) Derive ground state spectral term for p^2 case.
- (3) Explain charge transfer transition.
- (4) Define – Spin allowed, symmetry allowed and orbital allowed transition.
- (5) Explain the effect of temperature on magnetic properties of substances.
- (6) Write short note – Characteristics of paramagnetic substances.

(c) Answer any two of the following: **10**

- (1) Calculate the microstates for d^1 configuration.
- (2) Discuss the Hund's Rules to calculate ground state spectral term.
- (3) Discuss John-Teller theorem.
- (4) Discuss the absorption spectrum of Cu^{2+} .
- (5) Discuss the Gouy Balance method to measure magnetic susceptibility.

3 (a) Answer any three of the following : 6

- (1) Give the chemical reactions involved in glass manufacturing.
- (2) Define – Iodine value and Saponification value.
- (3) Define – Oil and fats.
- (4) Write notes on Shampoo.
- (5) Write about Acid Rain.
- (6) Define – BOD and COD.

(b) Answer any three of the following : 9

- (1) Explain the properties of glass.
- (2) Compare oil and fats.
- (3) Explain recovery of glycerine from spent lye.
- (4) Explain classification of surface active agents.
- (5) Write short note – Biosphere.
- (6) Briefly explain Green House effect.

(c) Answer any two of the following : 10

- (1) Enlist the raw materials for soap manufacturing.
- (2) Discuss the solvent extraction method for cotton seed oil with diagram.
- (3) Enlist the special types of glass, explain the photo chromic glass and optical glass.
- (4) Discuss Ozone Depletion.
- (5) Explain the source of water pollution.
