



DCI-003-1016006

Seat No. _____

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

July - 2022

Chemistry : C-601

(Inorganic & Industrial)

(Old Course)

Faculty Code : 003

Subject Code : 1016006

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

[Total Marks : 70

- Instructions :** (1) Total Five questions, each of 14 marks.
(2) All are compulsory.
(3) Figures to the right indicate full marks.

- 1 (a) Answer the following questions : 4
(1) What is spin Quantum number ?
(2) What is Hole pigeon Diagram ?
(3) What is J-J coupling ?
(4) What is term symbol ?
(b) Answer any **One** : 2
(1) Explain S-S Coupling.
(2) Find out spectral term of p^1 & d^1
(c) Answer Any **One** : 3
(1) Calculate S, M_s , J, M_J in $3F$ and $3P$.
(2) Calculate Microstates of $2D$ term.
(d) Answer Any **One** : 5
(1) Explain Hund's Rules to decide ground state of free ion spectral terms.
(2) Explain Russell Saunder's coupling.

- 2** (a) Answer the following questions : **4**
- (1) What is Jahn-Teller effect ?
 - (2) What is tetragonal complex ?
 - (3) What is Hole formalism ?
 - (4) What is spin selection rule ?
- (b) Answer any **One** : **2**
- (1) Draw the Orgel Diagram of D term.
 - (2) Explain the Absorption spectrum of Ni^{+2} .
- (c) Answer any **One** : **3**
- (1) Explain in detail Ti^{+3} absorption spectra.
 - (2) Compare the splitting of d^1 and d^9 spectral term.
- (d) Answer any **One** : **5**
- (1) Explain in detail Orgel diagrams.
 - (2) Discuss La Porte selection rules.
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- 3** (a) Answer the following questions : **4**
- (1) Define : Magnetic field.
 - (2) Define : Diamagnetism.
 - (3) Define : Curie temperature.
 - (4) Define : Magnetic Induction.
- (b) Answer Any **One** : **2**
- (1) Explain paramagnetic and ferromagnetic.
 - (2) Explain the effect of temperature on magnetic property of the substance.
- (c) Answer Any **One** : **3**
- (1) Define Winterization, Stand oil, Acid value.
 - (2) How will you find the saponification value of oil? Explain.
- (d) Answer Any One : **5**
- (1) Explain with diagram, the process of manufacturing of solid oil ?
 - (2) Explain how iodine value is determined.

- 4 (a) Answer the following : 4
- (1) Define : fog (2) Define - pollution.
- (3) Define : D.O. (4) Define : Green house.
- (b) Answer Any **One** : 2
- (1) Difference between BOD & COD.
- (2) Name some major water pollutants.
- (c) Answer Any **One** : 3
- (1) Explain different sources of SO and NO.
- (2) Explain major sources of air pollution.
- (d) Answer Any **One** : 5
- (1) What is meant by thermal pollution ?
What are the sources of it ?
- (2) Practicality how COD is determined explain.
- 5 (a) Answer the following : 4
- (1) What is Detergent ?
- (2) Define Soap.
- (3) Define Saponification.
- (4) What is use of Benzotriazol in detergents ?
- (b) Answer Any **One** : 2
- (1) What is importance of NaCl in soap manufactures?
- (2) Name the flavoring components of soap.
- (c) Answer Any **One** : 3
- (1) How following soaps could be manufactured :
(a) Medicated soap (b) Transparent soap
(b) Liquid soap
- (2) Explain how glycerine is recovered from spentlye.
- (d) Answer Any **One** : 5
- (1) Differentiate Soap form detergents.
- (2) Explain how Shampoo is manufactured ?