P-003-1016006 Seat No. _____

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

March / April – 2020

Chemistry : Paper - C - 601

(Inorganic & Industrial Chemistry) (New Course)

Faculty Code : 003

Subject Code : 1016006

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions :

(1) All the questions are compulsory.

(2) All the questions carry equal **14** marks each.

1 (a) Answer the following questions : **4**

(1) Give the formula to calculate microstates.

(2) What is spin multiplicity ?

(3) Give the ground state spectral term for d^8 system.

(4) Define – Multi electron system.

(b) Answer any one of the following questions : **2**

(1) Explain spectral term and term symbol.

(2) Explain L–S coupling.

(c) Answer any one of the following questions : **3**

(1) Explain Hund's Rules to determine ground state spectral term.

(2) Discuss Hole Pegion Diagram for p^2 case.

(d) Answer any one of the following questions : **5**

(1) Calculate the microstates for d^2 case.

(2) Discuss various types of coupling.

2 (a) Answer the following questions : **4**

(1) What is Hole formalism ?

(2) What is the splitting of D-term ?

(3) Which orbitals are not affected by ligand field presence ?

(4) What is tetragonal distortion structure ?

(b) Answer any one of the following questions : **2**

(1) Explain charge transfer transition.

(2) Explain La-Porte's spin selection rule and orbital selection rule.

(c) Answer any one of the following questions : **3**

(1) Discuss the splitting of d orbitals in square planer complexes.

(2) Write short note – Orgel diagram.

(d) Answer any one of the following questions : **5**

(1) Discuss the John-Teller theorem.

(2) Discuss the absorption spectrum of Ti^{3+}.

3 (a) Answer the following questions : **4**

(1) Define magnetic field.

(2) Give the standard substances useful to measure magnetic susceptibility of unknown substances.

(3) Give the formula of Butyric Acid.

(4) Name the common glycerides present in oil and fats.

(b) Answer any one of the following questions : **2**

(1) Explain magnetic permeability.

(2) Define – Saponification value and Iodine value.

(c) Answer any one of the following questions : **3**

(1) Write about magnetic properties affected by the temperature.

(2) Compare oil and fats.

(d) Answer any one of the following questions : **5**

(1) What is magnetic susceptibility ? Discuss Gouy Balance method.

(2) Discuss the solvent extraction method for cotton seed oil.

4 (a) Answer the following questions : **4**

(1) Name the four segments of environment.

(2) What is pollution ?

(3) Give the full form of CCl_2F_2.

(4) How thermal pollution arises ?

(b) Answer any one of the following questions : **2**

(1) Give three important components of environment.

(2) Define – BOD and COD.

(c) Answer any one of the following questions : **3**

(1) Write short note – Acid Rain.

(2) Explain – Photo chemical smog.

(d) Answer any one of the following questions : **5**

(1) Discuss the source of Water Pollution.

(2) Discuss in detail – Green House Effect.

5 (a) Answer the following questions : **4**

(1) What is Hard Soap ?

(2) Which oils are useful to make soft soap ?

(3) Which phenomenon occurs when soap comes in contact with water ?

(4) Define – detergents.

(b) Answer any one of the following questions : **2**

(1) Write about Shampoo manufacturing.

(2) Give the Oxo process for anionic detergents.

(c) Answer any one of the following questions : **3**

(1) Give the classification of detergents.

(2) Explain the recovery of glycerine from spent lye.

(d) Answer any one of the following : **5**

(1) Enlist the raw materials for soap manufacturing.

(2) Discuss Alfol process for detergent manufacturing with diagram.
