PF-003-001606 Seat No. _____

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

July - 2018

C -601 : Chemistry

(Inorganic & Industrial Chemistry) (New Course)

Faculty Code : 003

Subject Code : 001606

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

Instructions : (1) Answer all the questions.
(2) Q.1 carries 20 marks. Q. 2 and Q. 3 of 25 marks each.
(3) Right side figure shows marks.

1 Answer the following questions : **20**

(1) What is s-s coupling ?
(2) What is multi electron system ?
(3) By which coupling, term symbol is produced ?
(4) Define - Microstate.
(5) Which orbitals are not affected by presence of ligand field ?
(6) What is hole formalystic pair ?
(7) "Distoration of octahedral field does not affect much tag orbitals." True or False ?
(8) What is permeability for diamagnetic substances ?
(9) What is Larmor rotation ?
(10) Which motion is responsible for magnetism ?
(a) Spin (b) Orbital (c) Spin & Orbital both
(11) Which coloring agent is useful to form deep blue glass ?
(12) Define - Glass.
(13) "Soap lowers the surface tension of water." True or False ?
(14) What is the role of silicone in shampoo ?
(15) What is hard and soft soap ?
(16) What is winterisation of oil ?
(17) Define - Saponification Value.
(18) Which layer consists of ozone ?
(19) What is effect of Arsenic as toxin to human ?
(20) Define - Exosphere.

2 (a) Answer any **three** questions : **6**

(1) Explain spin multiplicity with example.

(2) Explain j – j coupling.

(3) Give limitations of Orgel diagram.

(4) Explain $\pi \rightarrow \pi^*$ charge transfer transition.

(5) Write about effect of temperature on magnetic property of substances.

(6) Name the substances used as standard to measure magnetic susceptibility.

(b) Answer any **three** questions : **9**

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

(2) Calculate the microstates for p^2 electronic configuration.

(3) Write short note : Splitting of d orbitals in square planner complexes.

(4) Explain La Porte selection rules for absorption spectrum.

(5) Define – Paramagnetic, ferromagnetic antiferromagnetic substances.

(6) Explain the equation for total angular momentum for paramagnetic substances.

(c) Answer any **two** questions : **10**

(1) Discuss the Gouy balance method to measure magnetic susceptibility.

(2) Discuss Russel - Saunder's coupling with example.

(3) Derive the spectral terms for d^2 state and decide ground state spectral term.

(4) Discuss the Jahn-Teller theorem in detail.

(5) Discuss the absorption spectrum of $\left[Ti\left(H_2O\right)_6\right]^{+3}$.

3 (a) Answer any **three** questions : **6**

(1) Give the physical properties of glass.

(2) Explain about Pot-furnase used in glass manufacturing.

(3) Give the classification of oil and fats.

(4) Write about amphoteric detergents.

(5) Explain – Acid rain.

(6) What is CFC ? Explain.

(b) Answer any **three** questions : **9**

(1) Give the chemical reactions involved in glass manufacturing.

(2) What is Iodine value ? Explain Wijs method.

(3) Give the properties of oil and fats.

(4) Enlist the raw materials used for manufacture of Soap.

(5) Explain photochemical smog.

(6) Write short note : Green House effect.

(c) Answer any **two** questions : **10**

(1) Discuss about the raw materials used in glass manufacturing.

(2) Describe the Batch process for Soap manufacturing.

(3) Discuss the classification of surface active agents.

(4) What is pollution ? Explain control of air pollution.

(5) Discuss the classification of Water pollutions.
