D-003-001606 Seat No. _____

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

April / May – 2015

Inorganic Chemistry & Industrial Chemistry : Paper - C - 601

Faculty Code : 003
Subject Code : 001606

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

Instructions : (1) All questions are **compulsory**.
(2) The figures to the **right** indicate the full marks.

1 Answer the following MCQ : **20**

(1) Term symbol is produced by _____ coupling.
(A) S-S (B) l-l
(C) j-j (D) R-S

(2) 2s + 1 is known as _____
(A) spin momentum (B) spin multiplicity
(C) spin orientation (D) none of these

(3) If angular momentum quantum number is 1 orbital will be _____
(A) s (B) p
(D) d (D) f

(4) Splitting of quantum number J in magnetic field is called _____.
(A) M_J (B) Micro state
(C) Both (A) and (B) (D) none of these

(5) Presence of ligand field does not affect_____ orbitals.
(A) s (B) p
(C) s and p (D) None of these

(6) Distortion of octahedral field does not affect much _____ orbitals.
(A) t_{2g} (B) e_g
(C) both (A) and (B) (D) none of these

(7) d^n and d^{10-n} is known as _____.

(A) symmetric (B) asymmetric

(C) hole formalystic (D) none of these

(8) Ratio 1/H is known as _____.

(A) permeability

(B) magnetic susceptibility

(C) magnetic induction

(D) None of these

(9) Symbol P in magnetochemistry is related to _____.

(A) paramagnetism (B) permeability

(C) polarization (D) none of these

(10) When orbital itself rotates around the nucleus is known as _____ rotation.

(A) spin (B) orbital

(C) Larmor (D) none of these

(11) Colouring agent cobalt chloride is added to glass to have_____ colour.

(A) pink (B) yellow

(C) blue (D) green

(12) Maumene test used for oil or fat sample indicates its _____.

(A) purity (B) solubility

(C) stability (D) none of these

(13) The principal raw material for glass is _____.

(A) alumina (B) sand

(C) clay (D) limestone

(14) The manufacturing process of slow cooling of glass to reduce strain is known as _____.

(A) annealing (B) finishing

(C) polishing (D) none of these

(15) The process of hydrolysis or oxidation of oil or fat on continuous expossure to moist air is called

(A) esterification (B) hydrogenation

(C) hydrogenolysis (D) rancidification

(16) The process of removal of saturated glycerides from oil is called _____

(A) hydrogenation (B) esterification

(C) winterisation (D) hydrogenolysis

(17) The substance used to make soap free from spent lye is_____.

(A) iodine (B) sodium chloride

(C) potassium chloride (D) bromine

(18) Fatty alcohols used for manufacture of anionic detergents can be obtained by :

(A) Wij's method (B) saponification

(C) nitration (D) oxo process

(19) The main component of stratosphere layer is _____.

(A) sulphur (B) water

(C) ozone (D) carbon dioxide

(20) The gaseous envelope surrounding the earth upto nearly 500 km above the surface of earth is _____.

(A) lithosphere (B) hydrosphere

(C) biosphere (D) atmosphere

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

(1) Explain l-l coupling.

(2) Define term symbol and spectral term.

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

(4) Draw Orgel diagram of F term

(5) Discuss magnetic induction

(6) Define ferromagnetic and anti-ferromagnetic substances.

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

(1) Write short note on Russel-Saunder's coupling

(2) Give ground state spectral term for Ni^{+2} ion.

(3) Discuss La-porte selection rule.

(4) Explain splitting of d - orbitals in square planar complexes

(5) Define diamagnetic substances and give its characteristics.

(6) Explain effect of temperature on magnetism.

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

(1) Discuss Guoy balance method for measurement of magnetic susceptibility.

(2) Describe Jahn - Teller effect.

(3) Discus the absorption spectrum of $[Ti(H_2O)_6]^{+3}$

(4) Discuss the microstate for p^2 case.

(5) Derive spectral term for d^2 state and spectral term of ground state.

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

(1) Define glass and write its physical properties.

(2) Write the definition of saponification value and acid value of oil.

(3) Define biological oxygen demand (BOD) and dissolved oxygen (DO)

(4) What is fog and smog ?

(5) Name any two methods used to obtain fatty alcohols for anionic detergents.

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

(1) Explain the method to determine iodine value of oil.

(2) Write a brief note on raw materials used for manufacture of glass.

(3) State classification of detergents with suitable examples.

(4) What is chemical oxygen demand ? Write the method for its determination.

(5) What is thermal pollution ? Write a note on its sources.

(6) Explain briefly the recovery of glycerine from spent lye.

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

(1) Name different types of fornaces used in manufacture of glass and explain any one with labelled diagram.

(2) What is soap ? Discuss the batch process for the manufacture of soap.

(3) Describe Oxo process and Welsh process for the manufacture of anionic detergents.

(4) Explain green house effect and ozone depletion.

(5) Describe the manufacture of cotton seed oil by solvent extraction method with diagram.
