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PBO-003-001103 Seat No. _____

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

November / December - 2018

Chemistry : Paper - 101

(Old Course)

Faculty Code : 003

Subject Code : 001103

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

Instructions :

(1) This question paper contains three questions, all are compulsory.

(2) Figures to the right indicate full marks.

1 Answer the following : **20**

(1) If bond multiplicity increases, what is effect on covalent radius value ?

(2) Define : Ionization potential.

(3) What is the hybridization in $BeCl_2$?

(4) What is the shape of molecule having Sp^3d hybridization ?

(5) Write electronic configuration of Cr.

(6) What is the oxidation state of Mn in $KMnO_4$?

(7) Complete reaction :

$$CH_3 \cdot CH_2 \cdot Br + KCN \xrightarrow[\Delta]{\text{aqueous}}_{\text{ethanol}}.$$

(8) What is β-elimination reaction ?

(9) Give IUPAC name of  .

(10) Draw structure of Spiro pentane.

(11) Define : Heat capacity.

(12) Define : Isolated system.

(13) What is desorption ?

(14) Which force is effective during physical adsorption ?

(15) Name type of standard solutions.

(16) 1 PPM = _____ gram per litre.

(17) Which solution is used to standardize NaOH ?

(18) Which is the conjugated base for HCl ?

(19) If pH of solution is 2, what is the concentration of H^+ in solution ?

(20) Give two examples of salt of weak acid + weak base.

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

(1) Explain Ionic radii.

(2) Write note on : Ionization Potential.

(3) Draw structure of CH_4 and SF_6.

(4) Discuss metallic character of transition elements.

(5) Write Perkin's method for preparation of cycloalkane.

(6) Write reaction of cycloalkane with Br_2.

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

(1) Discuss any three factors affecting ionization energy.

(2) Explain hybridization in C_2H_4 and C_2H_2.

(3) Write note on non-stoichiometric compounds.

(4) What is E^2 reaction ? Explain mechanism.

(5) Explain catalytic hydrogenation of cycloalkanes.

(6) Discuss physical properties of cycloalkanes.

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

(1) Discuss factors affecting the magnitude of electro negativity.

(2) Explain : Valence Bond Theory.

(3) Discuss various oxidation states of d-block elements.

(4) Explain : SN^2 reaction with mechanism.

(5) Discuss Bayer's Strain Theory.

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

(1) Explain extensive properties.

(2) Define : Isothermal process, Adiabatic process.

(3) Give limitations of Frundlich adsorption isotherm.

(4) Calculate molarity of 2 litre solution containing 100 gm NaOH (M.W. = 40 gm/mole)

(5) Write note : Buffer capacity.

(6) Discuss Arhenius principle of acid-base.

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

(1) Explain : Enthalpy.

(2) Discuss Zeroth law of thermodynamics.

(3) Derive Frundlich adsorption isotherm.

(4) Define : Normality, Molarity,Molality.

(5) Discuss Lewis concept for acid-base.

(6) Derive Kw for water.

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

(1) Prove Cp – Cv = R.

(2) Give difference between physical adsorption and chemical adsorption.

(3) Derive equation of Kh, h and pH for salt of strong acid + weak base.

(4) Explain mechanism of Buffer solution.

(5) Derive Lengmuir adsorption isotherm.
