



**JAT-003-001103**

Seat No. \_\_\_\_\_

**B. Sc. (Sem. II) (CBCS) Examination**

**December - 2019**

**Chemistry : Paper - 201**

*(Old Course)*

**Faculty Code : 003**

**Subject Code : 001103**

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

[Total Marks : 70

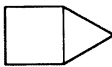
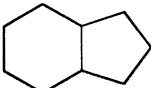
- Instructions :** (1) All questions are compulsory.  
(2) Right side number indicates marks of questions.  
(3) Don't do any rough work in question paper.

**1** Give answer of the following questions : **20**

- (1) Define : Ionization Energy.
- (2) Which element have highest electro-negativity in periodic table?
- (3) What type of hybridization present in  $PCl_5$  ?
- (4) In square planer shape, which type of hybridization present?
- (5) Provide the full form of VSEPR.
- (6) What is the oxidation state of Mn in  $KMnO_4$  ?
- (7) Which element is not consider as transition element in first transition series?
- (8) Provide structure of Benzyne.
- (9) What is the full form of  $E^2$  reaction ?
- (10) Complete the reaction :  
 $H_3C - NH_2 + CH_3 - CH_2 - COOH \rightarrow$
- (11) Give structure of 1,3-Cyclo-pentadiene.

- (12) Provide the structure of spiro[4,5]decane.
- (13) Give reaction of cyclobutane with hydrogen at 120 °C in presence of Ni.
- (14) Define system.
- (15) Define extensive property.
- (16) Which thermodynamic process has pressure remains constant ?
- (17) Define : Sorption.
- (18) Fill the blanks : The substance which is adsorbed is known as \_\_\_\_\_.
- (19) What is Normality?
- (20) Give equation of  $pOH$ .

2 (A) Answer any **three** of the following : 6

- (1) Write short note : Periodic trends of ionization energy in down the group.
- (2) Write short note on Hybridization.
- (3) Explain conductivity of first transition series.
- (4) Clarify Heterolytic cleavage with example.
- (5) Differentiate Electrophiles and Nucleophiles.
- (6) Give IUPAC name for  and 

(B) Answer any **three** of the following : 9

- (1) Explain Pauli's Exclusion principle.
- (2) Explain hybridization and shape in  $SF_6$  molecule.
- (3) Give electronic configuration of first transition series.
- (4) Write short note on Interstitial compounds.
- (5) Explain addition reaction and Markonikov's rule.
- (6) Write short note on Sacche-Mohr concept of stainless rings.

(C) Answer any **two** of the following : 10

- (1) Explain in detail about Atomic volume and Atomic radii.
- (2) Describe Valance bond theory with its limitations.
- (3) Explain : Magnetic properties and spectral properties of 1<sup>st</sup> transition series.
- (4) Explain mechanism, kinetics and stereochemistry of  $SN_2$  reaction.
- (5) Describe Baeyer's strain theory.

3 (A) Answer any **three** of the following : 6

- (1) Explain: Enthalpy.
- (2) Provides only names of factors affecting the adsorption of gases by solids.
- (3) Define : Solution and Concentration.
- (4) Calculate Normality of  $NaCl$  solution prepared by dissolving 2.90 gm of  $NaCl$  in 500 ml water. (equivalent weight of  $NaCl = 58.5 \text{ gm/mole}$ )
- (5) What is Lewis acids and Bases?
- (6) The concn. of H-ion in a sample of soft drink is  $3.8 \times 10^{-2} M$ , What is its pH?

(B) Answer any **three** of the following : 9

- (1) Write short note on Types of thermodynamic systems.
- (2) Describe about First law of thermodynamics.
- (3) Differentiate physical and chemical adsorption.
- (4) Explain any three applications of adsorption.
- (5) Explain equivalent weight of an acid and a base with example.
- (6) Write short note on pH scale.

(C) Answer any **two** of the following : **10**

- (1) Explain Joule-Thomson effect and give definition of Joule-Thomson inversion temperature.
  - (2) Derive Freundlich adsorption isotherm and explain limitations of it.
  - (3) Explain Molality and Molarity.
  - (4) Illustrate the mechanism of Buffer solution.
  - (5) For the salt of strong acid and weak base, calculate relation between  $K_h$ ,  $K_w$  and  $K_a$ , and calculate relation between  $K_h$  and Degree of hydrolysis ( $\alpha$ ).
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