



**HDT-003-001103**

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

**First Year B. Sc. (Sem. I) (CBCS) Examination**

November / December – 2017

**Chemistry : Paper - 101**

*(Old Course)*

**Faculty Code : 003**

**Subject Code : 001103**

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

[Total Marks : 70

1 Answer the following : 20

(1) Van-der waals radius is also known as \_\_\_\_\_

(2) What is the unit of ionization energy ?

(3) In  $PCl_5$  which hybridization is present ?


(4) Bond angle in  $BF_3$  molecules is \_\_\_\_\_

(5) Give electronic configuration of  $Cu^{+2}$ .

(6) Arrange in increasing order with ionic radii  
 $Cr^{+2}, Cr^{+4}, Cr^{+3}$

(7) How many steps in  $SN^1$  reaction ?

(8) What is Saytzeff's rule.

(9) Give IUPAC name of 

(10) What is the colour of cyclo octane ?

(11) What is system?

(12) Give the one example of intensive properties.

(13) What is Adsorption?

(14) Give two examples of adsorbent.

(15) Define : Molarity.

(16) Define : %w/w

(17) What is molarity of 10%w/v NaOH solution?

- (18) Define : Arrhenius Acid – Base  
(19) Define : pH  
(20) Find pH of 0.01 M NaOH solution.

2 (A) Answer the following : (Any **Three**) **6**

- (1) Explain Metallic radii
- (2) Explain ionization potential.
- (3) Explain  $sp^2$  hybridization.
- (4) Write the reaction of alkyl halide react with NaSH and  $K_2S$ .
- (5) Write reaction of cyclo hexane react with  $Br_2$  and alkaline  $KMnO_4$ .
- (6) Give uses of Fe and Zn.

(B) Answer the following : (Any **Three**) **9**

- (1) Write a note of electron affinity.
- (2) What is V. B. theory ?
- (3) Write the spectral properties of first transition series elements.
- (4) Write a note of elimination reaction.
- (5) Give preparation of cyclopentane by Dieckmann Method.
- (6) Write reaction of Cyclo Propane react with  $Br_2$ ,  $HCl$  and  $H_2/Ni$ .

(C) Answer the following : (Any **Two**) **10**

- (1) Explain Pauling Method for determination of ionic radius.
- (2) Explain VSEPR theory.
- (3) Give physical properties of first transition series element.
- (4) Explain  $SN^1$  reaction with Mechanism.
- (5) Explain Baeyer's strain theory.

- 3 (A) Answer the following : (Any **Three**) 6
- (1) Define : Open system, Statefunction
  - (2) Define : Adiabatic, Isothermal Process
  - (3) In a system 90 KJ energy give and 45 KJ work done by the system then find  $\Delta E$  .
  - (4) Give factor affecting of Adsorption.
  - (5) Define Lowry and Bronsted Acid Base.
  - (6) Give Cojugated Base of  $H_2SO_4$  and  $NH_4^+$ .
- (B) Answer the following : (Any **Three**) 9
- (1) Explain Heat and Work
  - (2) Prove  $dH = q_p$
  - (3) Give difference between physisorption and chemisorption.
  - (4) What is the mole fraction of 10% w/w NaOH Solution ?
  - (5) Derive Ka for weak acid.
  - (6) Explain pH.
- (C) Answer the following questions : (Any **Two**) 10
- (1) Prove  $C_p - C_v = R$  .
  - (2) Explain Langmuir adsorption Isotherm at high and low pressure.
  - (3) Derive formula for pH of salt of weak base and strong acid.
  - (4) Explain zeroth law of thermodynamics.
  - (5) Explain Buffer.
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