647510 **BSc3CheC0301** **Seat No :_____**

B.Sc. Semester - 3 (*CBCS*) Examination
Oct/Nov. -2019 (Old Course)
CHEMISTRY (CORE)

Time: 2:30 Hours **Marks: 70**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Q. 1 (A) Answer the following question. **(4)**

(1) Define Eigen function and Eigen value and write equation for Normalized and Orthogonal condition.

Q.1 (B) Answer the following question. (Any two) **(10)**

(1) Derive Schrodinger's wave equation in three dimensions (Cartesian co-ordinate).

(2) Derive potential energy of H_2 molecule and derive Schrodinger wave equation for it.

(3) Derive co-efficient of wave function for sp hybridization.

Q. 2 (A) Answer the following question. **(4)**

(1) Explain oxidation state of lanthanide elements.

Q. 2 (B) Answer the following questions. (Any two) **(10)**

(1) Discuss color properties of lanthanide ions.

(2) What are benzynes? Explain benzyne mechanism for Nucleophilic Substitution Reaction of aryl halide.

(3) Discuss lanthanide contraction.

Q. 3 (A) Answer the following question. **(4)**

(1) Explain basicity of amines and discuss effect of substituent on basicity of amines.

Q. 3 (B) Answer the following questions. (Any two) **(10)**

(1) What is diazotization? Write minimum four reactions of diazonium salt.

(2) Explain Williamson Synthesis for preparation of ethers.

(3) Discuss relative acidity of alcohol and phenols.

Q. 4 (A) Answer the following question. **(4)**

(1) Write equation of phase rule and define phase, component and degree of freedom.

Q. 4 (B) Answer the following questions. (Any two) **(10)**

(1) Explain Riemer-Tiemann reaction with mechanism.

(2) Describe phase diagram of water system.

(3) Explain phase diagram of Pb-Ag system.

Q. 5 (A) Answer the following question. **(4)**

(1) Explain factors affecting solubility of solid, liquid and gases substances.

Q. 5 (B) Answer the following questions. (Any two) **(10)**

(1) Derive Nernst distribution law and state its limitations.

(2) Explain positive and negative deviation from Raoult's Law.

(3) Discuss Henry's law in detail.

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