C.U.SHAH SCIENCE COLLEGE

B.Sc. Semester- II

March 2017

Chemistry: 103

Date: 17/03/2017

Time: 02:45 to 04:30

Marks: 50+10=60

Seat No._____

Que 1. Answer the followings: (12)

1. Discuss the bond angle of CH_4, NH_3 and H_2O molecule
2. Write a note on Werner's principles.

Or

1. What is Sidgewick- Powell Theory? Explain the shape of PCl_5.
2. Explain Labile and inert complexes.

Que 2. Answer the followings: (13)

1. Explain: Eigen value, Eigen Function and Eigen equation.
2. What is an operator? Explain different type of Operators.

Or

1. Explain: Normalized and Orthogonal Functions
2. Derive Hamiltonian operators for H_2^+ (Z=1) and He (Z=2)

Que 3. Answer the followings: (12)

1. Explain rules of R-S nomenclature by giving suitable examples.
2. Discuss the Conformational analysis of n-butane.

Or

1. Discuss the optical isomerism of Lactic acid
2. Discuss the Conformational analysis of Ethane with their order of stability.

Que 4. Answer the followings: (13)

1. Derive equations of Degree of hydrolysis (α) and **PH** for the solution of salt of weak Acid and strong Base.
2. Calculate no. of α particles and β particles during the following Radioactive decay:

   (i) $_{90}Th^{232} \longrightarrow {}_{88}Ra^{224}$ (ii) $_{92}U^{238} \longrightarrow {}_{82}Pb^{206}$

Or

1. Define Molar conductance and calculate the molar conductance of 0.02 M aqueous-Solution of an electrolyte. (Its resistance is 200 ohm and cell constant is 0.9 cm^{-1})
2. Explain Soddy's Group Displacement Law with suitable illustration .

Que 5. MCQS (10)

1. BeF_2 is _____molecule.

   (A)Linear (B)Trigonal plane (C)Tetrahedral (D)Pentagonal

2. Which one is paramagnetic?

   (A) $[Ni(CO)_4]$ (B) $[Fe(CN)_6]^{-4}$ (C) $[Ni(CN)_4]^{-2}$ (D) $[COF_6]^{-3}$

3. Electron released from metals by incident radiation is called as ……..

   (A) Ionization (B) photoelectric effect (C) Crystallization (D) Radioactivity

4. Which one is the correct statement?

   (A) Hermitian operator is non linear and has invalid Eigen value

   (B) Commutator means the multiplication with one

   (C) Hermitian operator is nonlinear and has real Eigen value

   (D) Hermitian operator is linear and has real Eigen value

5. How many loan pair electrons in I_3^- (Triiodine ion)

   (A) 3 (B) 6 (C) 12 (D) 15

6. Alkenes show geometric isomerism due to …..

   (A) Asymmetry (B) Rotation around single bond

   (C) Resonance (D) Restricted rotation around double bond

7. Stability order of conformers of cyclohexane is….

   (A) Chair> Twist boat> Boat>half chair (B) Chair> Boat> Twist Boat>half chair

   (C) Boat>half chair >Chair> Twist boat (D) Chair> half chair> Boat> Twist Boat

8. PH of 10^{-8} M HCl solution is …….

   (A) 8 (B) 7

   (C) Slightly less than 7 (D) Slightly more than 7

9. Which radio active element was discovered by Becquerel?

   (A)Thorium (B) Uranium (C) Polonium (D) Radium

10. Unit of Specific conductance is ?

    (A)$ohm^{-1}cm^{-1}mol^{-1}$ (B) $ohm^{-1}cm^{-1}eqvt^{-1}$ (C) $ohm^{-1}cm^{-1}$ (D) given all