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Avinashilingam Institute for Home Science and Higher Education for Women  
[Deemed to be University] Coimbatore-641 043

**Bachelor's Degree Examination – November 2018**

**III Semester**

**Class : II UG**  
**Major : Physics**

**Time : 3 hours**  
**Max. Marks: 100**

**15BPHI03 DSE-III/ 14BPHI03 Allied - III Chemistry Theory for Physics**

**Part-A**

**10 x 1=10**

**Choose the correct answer**

- Which of the following is used for the separation of liquids?  
a. Burette      b. separating funnel      c. pipette      d. beaker
- 20g of NaOH is dissolved in 1000 ml of water. The molality of the solution is  
a. 0.5m      b. 1m      c. 1.5m      d. 2m
- Glucose is soluble in water due  
a. presence of C=O      b. Vanderwal's forces      c. H-bonding      d. ionic nature
- The hybridization of ammonia is  
a.  $sp^2$       b.  $sp^3$       c.  $dsp^2$       d.  $sp$
- The valency of carbon in benzene is  
a. 4      b. 3      c. 2.5      d. 2
- Which of the following has highest electronegativity?  
a. Br      b. Cl      c. F      d. I
- The EAN for  $NiCO_4$  is  
a. 16      b. 14      c. 18      d. 8
- The strongest ligand is  
a.  $H_2O$       b.  $NH_3$       c. CO      d.  $F^-$
- The strong electrolyte is  
a. sodium acetate      b. water      c. acetic acid      d. ammonium hydroxide
- The temperature of the Standard state is  
a. 273 K      b. 298 K      c. 293 K      d. 303 K

**Part B****5 X 6=30**

**Answer the following**  
**Answer should not exceed 400 words or two pages**

- 11.a. Give an account on description and handling of burette, pipette and standard flask.  
(or)
- 11.b. Describe the importance and functions of chemical balance.
- 12.a. Illustrate the formation of ionic and covalent bonds with an example each.  
(or)
- 12.b. Define H-bonding and discuss its types.
- 13.a. Draw any six organic compounds of your choice and give their IUPAC name.  
(or)
- 13.b. Discuss the general characteristics of s block elements.
- 14.a. Describe the concept of EAN with any four examples.  
(or)
- 14.b. What are conducting polymers? Give examples and their applications.
- 15.a. Explain equivalent conductance and specific conductance. What happen to them on dilution?  
(or)
- 15.b. Explain the heat of reaction at constant pressure and constant volume.

**Part C****5 x 12=60**

**Answer the following**  
**Answer should not exceed 800 words or four pages**

- 16.a. Explain the precautionary measures to be taken while handling flammable, volatile, hazardous and corrosive chemicals.  
(or)
16. b. (i) Describe the principles of acid-base titrations  
(ii) Explain the terms Mole fraction and molarity.
- 17.a. Describe the hybridization and geometry of methane, ethylene and water.  
(or)
17. b. (i) Highlight the importance of Hund's rule and Aufbau principle [6+6]  
(ii) Give an account on the stability of half filled and fully filled orbitals.
- 18.a. Explain the trend of the following properties in the periodic table: [4X3]  
(i) ionization energy (ii) electronegativity (iii) size (iv) density  
(or)
- 18.b. Discuss classification of organic compounds with examples
- 19.a. (i) Define ligand and coordination number. [4+8]  
(ii) Describe the concepts of Werner's coordination theory with examples  
(or)
- 19.b. Give an account on geometrical and optical isomerism exhibited by 6 coordinate complexes.
- 20.a. (i) Give an account on Kohlrausch's law and its applications. [6+6]  
(ii) Define  $P^H$ ,  $P^{Ka}$  and electrode potential.  
(or)
20. b. Explain the following: [4+4+4]  
(i) Standard enthalpy of formation (ii) Enthalpy of neutralization (iii) Bond dissociation energy