CBCS SCHEME

USN | | | | | | | | | | |

18PC34

Third Semester B.E. Degree Examination, Dec.2019/Jan.2020
Physical, Organic and Inorganic Chemistry

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain Dalton's atomic theory. Mention any three limitations of the theory. **(08 Marks)**

b. How will you define 'normality' of a solution? Illustrate how 2N solution of potassium dichromate is prepared. (Mol. mass of $K_2Cr_2O_7$ = 294) **(06 Marks)**

c. Illustrate the terms : (i) Emulsion (ii) Surfactant (iii) Miscelle, with example. **(06 Marks)**

OR

2 a. What is Adsorption? Write an example. How do you differentiate physical adsorption from chemical adsorption? **(08 Marks)**

b. Illustrate the term 'Colloid' with an example. Mention any four types of colloids with one example for each. **(06 Marks)**

c. (i) Compute number of moles present in 64g of oxygen
(ii) How many grams are there in 5.5 mol of Sulphar
(Given Molar mass of oxygen = 32 g/mol; Molar mass of sulphar = 32 g/mol) **(06 Marks)**

Module-2

3 a. What is hybridization? Explain any three types of hybridizations with examples. **(08 Marks)**

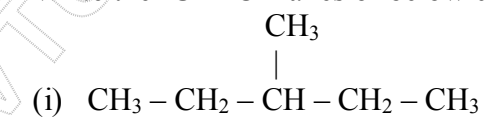
b. Explain the shapes of (i) Methane (ii) Ethylene. **(06 Marks)**

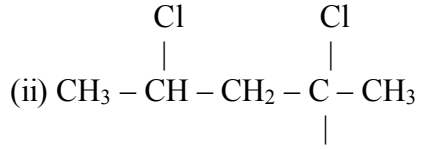
c. "Tertiary butyl carbocations are more stable than secondary carbocations". Justify the statement on the basis of hyper conjugation. **(06 Marks)**

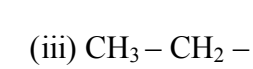
OR

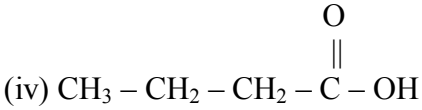
4 a. What is isomerism in organic compounds? Explain any three types of structural isomerism by taking suitable examples. **(08 Marks)**

b. Write the IUPAC manes of below compounds:

(i) 

(ii) 

(iii) 

(iv) 

(v) 

(vi) 

(06 Marks)

c. Illustrate the confirmations of ethane molecule on the basis of Newman projections. What is dihedral angle? **(06 Marks)**

Module-3

5 a. What is hydrogen bonding? Write different types of hydrogen bonding with examples. Explain the effect of hydrogen bonding on boiling points of liquids with suitable examples. **(08 Marks)**

b. "Trifluoro acetic acid is stronger acid than acetic acid". Justify the statement on the basis of inductive effect. **(06 Marks)**

c. What are carbonions? How they are formed? Explain the stability, structure of carbonions. **(06 Marks)**

OR

6 a. Explain types of bond cleavage taking suitable examples. Illustrate structure and stability of free radicals. **(08 Marks)**

b. "Dimethyl amine is stronger base than ammonia". Justify the statement on the basis of inductive effect. Why trimethyl amine is less basic than dimethyl amine? **(06 Marks)**

c. Illustrate resonance effect with example. Justify the statement "ethyl carbocation is less stable than allyl carbocation". **(06 Marks)**

Module-4

7 a. Write postulates of Bohr's theory. Mention the Bohr's equation for energy of electron in H-atom. Write any two limitations. **(08 Marks)**

b. What are quantum numbers? Explain magnetic and azimuthal quantum numbers. **(06 Marks)**

c. Explain Slater's rules for evaluation of screening constant. Write any two applications. **(06 Marks)**

OR

8 a. What is Pauli's exclusion principle? Draw energy level diagram of multielectron atoms. **(08 Marks)**

b. Explain Hund's rule of maximum multiplicity. Write the electronic configurations of Na(at. No. 11), Ti(at. No. 22) and Zn(at. No. 30). **(06 Marks)**

c. Explain (i) Photoelectric effect (ii) Zeeman effect (iii) Heisenberg's uncertainty principle. **(06 Marks)**

Module-5

9 a. Define periodicity. Explain periodic trends in terms of (i) atomic radii (ii) ionization energy. **(08 Marks)**

b. What is screening / shielding effect? Explain the factors atomic size and nuclear charge, which determines ionization energy. **(06 Marks)**

c. Explain the features of s and d block elements with suitable examples. **(06 Marks)**

OR

10 a. Illustrate the periodic trends in terms of (i) atomic volume (ii) electron affinity (iii) ionic radii (iv) metallic character. **(08 Marks)**

b. Explain following factors which determines electronegativity of elements in periodic table (i) Charge on the atom (ii) Hybridization. **(06 Marks)**

c. Illustrate the features of 'p' and 'f' block elements with suitable examples. **(06 Marks)**

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