

**Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University), Coimbatore-641 043**

Comprehensive Examination – November 2018

I Semester

**Class : UG
Major : Chemistry**

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

18BCHC02 - BASICS OF CHEMISTRY-II

Part-A

10 x 1=10

Choose the correct Answer

1. Increasing order of electronegativity of the element is
a. C,N,Si,P b. N,Si,C,P c. Si,P,C,N d. P,Si,C,N
2. The highest electron affinity is for the element
a. P b. Cl c. Br d. I
3. Which ion has smallest size?
a. N⁻³ b. O⁻² c. F⁻ d. Na⁺
4. When we move from left to right across a period, the electron affinity in general
a. remains the same b. decreases
c. increases d. becomes zero
5. 2 - methyl propene reacts with HBr to give
a. Isobutyl bromide b. n - butyl bromide c. but - 2 - yne d. t-butylbromide
- 6 . Which one is a cumulated diene?
a.allenes b.spiranes c. but - 2 -yne d. Acetylene.
7. Which alkyne yields propanoic acid as the only product upon treatment with ozone followed by hydrolysis?
a. 1 - Butyne b. 2 - Hexyne c.1 - Pentyne d. 3 - Hexyne
8. In Diels -Alder reaction, diene reacts with
a. dicarboxylic acid b. diamine c. dienophile d. diazomethane
9. The compound formed by sp³d hybridization will have the structure as
a. planar b. pyramidal c. angular d. trigonal bipyramidal.
10. Plastic buckets and mugs are easily broken because of the presence of
a. ionic bond b. covalent bond
c. vanderwaal's forces d. hydrogen bond.

Part B

5 X 6=30

Answer the following

Answer should not exceed 400 words or two pages

- 11.a. Radius of a cation is invariably smaller than that of an atom and that of an anion invariably lower than that of the corresponding atom. Explain in detail.
(or)
- 11.b. What are crystalline solid? Explain in detail about various types of crystals with suitable examples.

- 12.a. Define electronegativity. How does it vary along a period and down the group in a periodic table? Give its applications.
(or)
- 12.b. Compare Mulliken and Allred Rochow scale of electronegativity.
- 13.a. What are dienes? How are they classified? Give two examples for each type.
(or)
- 13.b. What is allylic substitution and vinylic substitution? Explain with suitable examples.
- 14.a. What are alkynes? Why are these unsaturated in nature? Illustrate with orbital structure.
(or)
14. b. Describe polymerization, halogenation, hydroboration oxidation reactions of alkynes.
- 15.a. Explain in detail about different types of Vanderwaal's forces.
(or)
15. b. State and explain VSEPR theory. Applying this theory explain the shapes of NH_3 , H_2O and CH_4

Part C

5 x 12=60

Answer the following

Answer should not exceed 800 words or four pages

- 16.a. What is meant by atomic radii, ionic radii, and covalent radii? What are the factors influencing the magnitude of ionic, atomic and covalent radii?
(or)
- 16.b . i. Define ionization potential, what are the factors that affect the ionization potential of an element? (8)
ii. Define Co – ordination number and radius ratio. (4)
- 17.a. Derive Pauling's Scale of electronegativity.
(or)
17. b.i. Distinguish between electron affinity and electronegativity. (5)
ii. Discuss the various factors which govern electronegativity and electron affinity. (7)
- 18.a. State and explain MarkovniKoff's rule and anti – Markovnikoff's rule with suitable examples.
(or)
18. b. i. How does ozonolysis help in locating the position of double bond in alkene? (4)
ii. Explain hydrogenation, hydroboration and oxy – mercuration reactions of alkenes with suitable examples. (8)
- 19.a. Explain in detail the mechanism of electrophilic and nucleophilic addition reactions of alkynes.
(or)
19. b.i. Do all alkynes show acidic nature? Explain.
ii. What happens when acetylene vapours are passed through dilute H_2SO_4 in the presence of HgSO_4 ? Give the mechanism of the reaction.
- 20.a. Explain the salient features of molecular orbital theory. Draw and explain the M.O diagram of O_2 Molecule. Calculate its bond order and explain its magnetic character.
(or)
20. b. i. Explain the dsp^2 and sp hybridisation with suitable examples. (5)
ii. What is hydrogen bond? How is it classified ? Give suitable examples for each type. What are the consequences of hydrogen bonding? (7)