

Model Question Paper
Atomic Structure - II -Part V

12th Standard

Chemistry

Reg.No. :

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I. Answer all the questions.

II. Use Blue pen only.

Time : 02:00:00 Hrs

Total Marks : 70

5 x 1 = 5

Section-A

- 1) The total number of spherical nodes for any s-orbital
(a) depends on the magnetic quantum number (b) is equal to $n-1$ (c) is equal to l (d) is equal to m
- 2) Node or Nodal surface is a region in which the probability of finding the electron is nearly
(a) Unity (b) Less than unity (c) Greater than unity (d) Zero
- 3) If the probability of finding an electron is same in all directions then the shape of the orbital
(a) dumb-bell (b) double dumb-bell (c) Spherical (d) Clover leaf
- 4) The number of possible orientations of the orbital when $l=2$ is
(a) Only one (b) Three (c) Five (d) Seven
- 5) Which of the following statement is correct?
(a) Three 'p' orbitals are equal in energy, but differ in their orientations. (b) Three 'p' orbitals have same orientations, but they differ in energy
(c) Three 'p' orbitals are equal in energy and they have same orientation. (d) Three 'p' orbitals differ in energy and orientation

Section-B

6 x 3 = 18

- 6) How will you predict the type of hybridisation in CO_3^{2-} using valence electrons?
- 7) How will you determine the strength of hydrogen bonds?
- 8) Explain the consequences of intermolecular hydrogen bonding
- 9) Mention any two importance of hydrogen bonding
- 10) Explain hydrogen bonding HF molecule
- 11) Give the conditions for effective hydrogen bonding

Section-C

3 x 5 = 15

- 12) Derive de-Broglie relation and give the significance
- 13) Give any five postulates of molecular orbital theory
- 14) Apply molecular orbital theory to nitrogen molecule.

Section - D

3 x 10 = 30

- 15) a) Write a note on intermolecular and intramolecular hydrogen bonding
b) Give the importance of hydrogen bonding
- 16) a) Calculate the type of hybridisation using valence electron in the following species
a) NO_3^- b) NO_2^- and c) $BeCl_2$
b) Write a note on the essential conditions and strength of hydrogen bonding
- 17) a) Apply molecular orbital theory to oxygen molecule.
b) Give any five salient features regarding hybridisation
