

(i) Printed Pages : 3

Roll No.

(ii) Questions : 9

Sub. Code :

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Exam. Code :

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B.Sc. (General) 1st Semester
(1129)

CHEMISTRY

(Same for B.Sc. Microbial & Food Tech.)

Paper-I

(Inorganic Chemistry-A)

Time Allowed : Three Hours]

[Maximum Marks : 22

Note :—Attempt **FIVE** questions in all, selecting at least **ONE** question from each unit. Unit-V (Q. No. 9) is compulsory.

UNIT—I

1. (a) Derive the Schrodinger wave equation and define the each term involved in it.
(b) Write three difference between orbit and orbital.
(c) How is the number of orientations related to l (azimuthal quantum number) ? 2,1,1
2. (a) Why is 4s orbital lower in energy than 3d-orbital.
(b) Define exchange energy and discuss its importance in influencing electronic configuration.

- (c) Calculate the de Broglie wavelength of an electron that has been accelerated from rest through a potential differences of 1 kV. 1,1,2

UNIT—II

3. (a) Which possess high electron affinity F or Cl ? Why ?
(b) Find out the effective nuclear charge for a 3d electron in an atom with atomic number 30. 2,2
4. (a) What are isoelectric ions ? Compare the size of Mg^{2+} and O^{2-} ions ?
(b) The internuclear distance in KCl is 3.14\AA . Calculate the ionic radii of K^+ and Cl^- ions using pauling method. 2,2

UNIT—III

5. (a) Why are alkali metals strong reducing agents ?
(b) Draw the structure of the following :
(i) Dibenzo-14-crown-4.
(ii) 2,2,2-crypt ligand. 2,2
6. (a) What caused delay in the study of chemistry of noble gases ? What prompted Bartlett to prepare the first noble gas compound ?
(b) Why do helium and neon not form clathrates ? 2,2

UNIT—IV

7. (a) Using VSEPR theory explain the structure of IF_7 , ClO_4^- ion.
- (b) Calculate the percentage ionic character of HF : Given Bond distance = 0.92\AA , dipole moment = 1.19. 2,2
8. (a) Draw MO diagram of NO and compare the bond orders of NO , NO^+ , NO^- .
- (b) Define resonance energy and give the resonating structure of carbon dioxide. 2,2

UNIT—V

9. (a) Draw Radial Probability Curve for 3p orbital.
- (b) Discuss significance of ϕ and ϕ^2 .
- (c) Why Na^+ is smaller in size than Na ?
- (d) Do you think, sodide ion can exist ?
- (e) Arrange the electron affinity of halogens in the decreasing order.
- (f) Why hydrogen forms diatomic molecule while Helium remains monoatomic. 6×1