

16U218

(Pages: 2)

Name.....

Reg. No.....

SECOND SEMESTER B.Sc. DEGREE EXAMINATION, MAY-2017

(Regular/Supplementary/Improvement)

(CUCBCSS - UG)

CC15UCHE2B02-THEORETICAL AND INORGANIC CHEMISTRY - II

(Core Course: Chemistry)

(2015 Admission Onwards)

Time: Three Hours

Maximum: 80 Marks

Section A (One word)

Answer all ten questions. Each question carries 1 mark

1. The number of 3d electrons in Cu^{2+} is
2. In the expression $\hat{A} f(x) = g f(x)$, g is called
3. Boron atom shows diagonal relationship with.....
4. The general electronic configuration of f block elements is.....
5. Among the elements Li, Be, Al and B the correct ascending order of atomic radius is
6. The increasing order of electro negativity of the elements O, Na and F is.....
7. The hybridized state of bromine in BrF_5 is.....
8. The bond order of C_2 molecule is
9. Greater the charge on cation and anion, the covalent character of an ionic bond is
10. The structure of NH_4^+ is.....

Section B (Short answer)

Answer any ten questions. Each carries 2 marks.

11. Give the radial distribution curve of the orbital of $n=2$ and $l=0$.
12. What are a) well behaved wave function and b) normalized wave function?
13. Half filled and fully filled electronic configurations have greater stability. Why?
14. Sketch the shapes of orbital for $n=2$ and $l=1$.
15. Cations are smaller and anions are larger than the neutral atoms. Why?
16. What is bond order? How is it related to bond enthalpy and bond length?
17. What is meant by polarizing power of the cation? Mention the factors influencing it.
18. Using MO configuration, justify the magnetic behavior of CO molecule.
19. How is dipole-dipole interaction energy related to Kelvin temperature?

20. Write Born-Land equation and explain the terms.
21. Write the time independent Schrodinger wave equation and explain the terms.
22. Electron affinities of noble gases are zero. Why?

Section C (Paragraph)

Answer any five questions. Each question carries 6 marks

23. Calculate the kinetic energy of an electron in the ground state confined to a box of width 3×10^{-10} m and moving in one direction only. Also calculate the energy when the electron is in the $n=2$ level. What is the wavelength of the spectral transition?
24. Derive the expression for energy of a particle in a one dimensional box. What is zero point energy?
25. Discuss the factors that affect the electronegativity of elements.
26. Taking a suitable example explain how the concept of hybridization explains the geometry of molecules.
27. Explain the deviation in bond angles of water and ammonia with the help of hybridization theory.
28. Draw the MO energy diagram of NO. Find out the bond order. Discuss the stability and magnetic behaviour.
29. Explain the electrical and thermal conductivities of metals by using band theory.
30. Write a note on inter molecular forces.

Section D (Essay)

Answer any two questions. Each question carries 10 marks

31. State and explain the postulates of quantum theory.
32. a) The modern periodic table reflects the electronic configuration of elements. Explain.
b) Mention the demerits of long form periodic table.
33. State and explain the postulates of VSEPR theory. Using this theory explain the shape, geometry and reactivity of IF_7 .
34. Compare and contrast VB theory with MO theory.
