

Name.....

Date: - 02 – 05 – 2020

**Chemistry: - 1<sup>st</sup> year Test # 2**

**Q. No 1 MCQs** Encircle the correct possible answer **Time: 20min...**

**Marks 17**

- Which one substance shows the phenomenon of allotropy and possesses a definite transition temperature?  
(a) Lime (b) Carbon (c) Sulphur (d) Phosphorous
- What types of solids have quite different physical and chemical properties?  
(a) Isomorphs (b) Polymorphs (c) Allotropes (d) Anisotropes
- Which one solid has a cubic crystal system with  $a = b = c$  and  $\alpha = \beta = \gamma = 90^\circ$ ?  
(a) Sugar (b) Graphite (c) Boric acid (d) Diamond
- Which one of the followings has the minimum vapour pressure at room temperature?  
(a) Diethyl ether (b) isopentane (c) water (d) Glycerol
- Which one hydrocarbon will have the lowest  $\Delta H_v$  (Enthalpy of vaporization)?  
(a) Methane (b) propane (c) pentane (d) hexane
- Dipole – induced – Dipole forces are also called:  
(a) Dispersion forces (b) London forces (c) Ion dipole forces (d) Debye forces
- Which one of the following is a least volatile compound?  
(a)  $\text{NH}_3$  (b)  $\text{H}_2\text{S}$  (c)  $\text{H}_2\text{O}$  (d) HF
- Which one of the following halogen acids has weaker acidic strength?  
(a) HI (b) HF (c) HCl (d) HBr
- According to Bohr's model, the radius of the second orbit is:  
(a)  $2 \times 10^{-9} \text{A}^\circ$  (b)  $2.11 \times 10^0 \text{A}^\circ$  (c)  $2.11 \times 10^{-11} \text{m}$  (d)  $2.11 \times 10^{-12} \text{m}$
- The  $e/m$  value for the positive rays is maximum for  
(a) Hydrogen (b) Helium (c) Oxygen (d) none of these
- The orbitals having same energy are called:  
(a) Hybrid orbitals (b) Valence orbitals (c) degenerate orbitals (d) symmetrical orbitals
- The shape of an orbital is governed by:  
(a) Magnetic quantum number (b) principal quantum number  
(c) azimuthal quantum number (d) spins quantum number
- The azimuthal quantum number  $\ell = 2$ , then magnetic quantum number 'm' has values:  
(a) +1, 0, -1 (b) 0 (c) +2, +1, 0, -1, -2 (d) +3, +2, +1, 0, -1, -2, -3
- How many total electrons will be there in d- sub shell?  
(a) 2 (b) 6 (c) 10 (d) 14
- A material or a collection of materials which is under study is called:  
(a) State function (b) System (c) Surrounding (d) any substance
- At constant volume  $q_p$  is equal to:  
(a)  $\Delta H$  (b)  $\Delta E$  (c)  $\Delta P$  (d)  $\Delta V$
- The values of  $\Delta H$  and  $\Delta E$  are approximately the same for those processes in which the liquids and solids are involved. The reason is that:  
(a) Heat is absorbed in the process (b) Heat is released in the process  
(c) Volume remains constant (d) Temperature remains constant

**Chemistry: - (Subjective) 1<sup>st</sup> year**

**Time: - 2hrs: 40min....**

**Date: - 02 – 05 – 2020**

**NOTE:** Give short answers of all questions

**Section- I**

**22 x 2 = 44**

**Q. No 2 Give short answers of all questions**

**8x2=16**

- What are the advantages of vacuum distillation?
- Why n – Hexane has higher boiling point than that of ethane?
- Why is HF weaker acid than that of other Halogen acids?
- How liquid crystals can be divided into different types?
- Why the ionic crystals are highly brittle?
- Why diamond is hard and electrical insulator?
- Why metals are good conductor? But the electrical conductivity of metals decreases with increase in temperature. Give reason
- Justify that the crystals showing isomorphism mostly have the same atomic ratio.

**Q. No 3 Give short answers of all questions**

**8x2=16**

- Give a comparison of orbit and orbital
- Why the potential energy of the bounded electron is negative?
- What is the origin of line spectrum?
- Why is it necessary to decrease the pressure inside the discharge tube to get the cathode rays?
- The  $e/m$  value of positive rays for different gases are different but those for cathode rays, the  $e/m$  values are the same. Justify it
- What is Hund's rule?
- What is the distribution of electrons in orbitals of  $_{29}\text{Cu}$  and  $_{24}\text{Cr}$ ?
- Justify that limiting line in Ballmer Series lies in the UV- region, but all other lines in the visible region.

**Q. No 4 Give short answers of all questions**

**6x2=12**

- Define the terms State, State function.
- Define specific heat and heat capacity
- What is meant by enthalpy of neutralization?
- What is meant by enthalpy of combustion?
- Prove that  $q_v = \Delta E$
- What is thermochemistry?

**Extensive Questions**

**3x8 = 24**

**NOTE:** Attempt all three questions

- Q. No 5. (a)** Differences between Crystalline and amorphous solids 4  
**(b)** X- rays study and Atomic Number 4
- Q. No 6. (a)** Explain Millikan's experiment to determine the charge of an electron 4  
**(b)** What is the lattice energy? How does Born –Haber cycle help to calculate the lattice energy of NaCl? 4
- Q. No 7. (a)** What is meant by standard enthalpy of combustion? Discuss its measurement. 4  
**(b)** Describe Hydrogen bonding and its importance in biological systems 4