

Time: 20 Minutes

OBJECTIVE

Code : 6483

Marks: 17

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

1. The rate of reaction  
(A) increases as the reaction proceeds (B) decreases as the reaction proceeds  
(C) remains same as the reaction proceeds (D) may increase or decrease as reaction proceeds
2. The pH of  $10^{-3}$  moles/dm<sup>3</sup> of an aqueous solution of H<sub>2</sub>SO<sub>4</sub> is  
(A) 3.0 (B) 2.7 (C) 2.0 (D) 1.5
3. Stronger is the oxidizing agent, greater is the  
(A) oxidation potential (B) reduction potential  
(C) redox potential (D) emf of the cell
4. The change in heat energy of a chemical reaction at constant temperature and pressure is called  
(A) enthalpy change (B) heat of sublimation  
(C) bond energy (D) internal energy change
5. Oxidation number of Fluorine in OF<sub>2</sub> is  
(A) -1 (B) -2 (C) +2 (D) +1
6. Calorie is equivalent to  
(A) 0.4184J (B) 41.84J (C) 4.184J (D) 418.4J
7. Molarity of pure water is  
(A) 1 (B) 18 (C) 55.5 (D) 6
8. The partial pressure of Oxygen in air is  
(A) 116 torr (B) 159 torr (C) 180 torr (D) 190 torr
9. Catalyst used in conversion of SO<sub>2</sub> into SO<sub>3</sub> in contact process is  
(A) MgO (B) Al<sub>2</sub>O<sub>3</sub>
10. The molar volume of CO<sub>2</sub> is maximum at  
(A) STP (B) 127°C and 1 atm
11. The number of bonds in Nitrogen molecule is  
(A) one Sigma and One Pi (B) One Sigma and Two Pi  
(C) Three Sigma only (D) Two Sigma one Pi
12. Gooch crucible is made up of  
(A) porcelain (B) silver (C) iron (D) glass
13. Quantum number values for 2P orbital are  
(A) n=2, l=1 (B) n=1, l=2 (C) n=1, l=0 (D) n=2, l=0
14. Nickel has isotopes  
(A) 2 (B) 3 (C) 4 (D) 5
15. Ionic solids are characterized by  
(A) low melting points (B) good conductivity in solid state  
(C) high vapour pressure (D) solubility in polar solvents
16. Mass of one mole of electrons is  
(A) 1.008 mg (B) 0.55 mg (C) 0.184 mg (D) 1.673 mg
17. Water boils at 98°C at external pressure of  
(A) 700 torr (B) 765 torr (C) 800 torr (D) 900 torr

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Note: Section-I is compulsory. Attempt any THREE (3) questions from Section-II.

**SECTION - I**

2. Write short answers to any EIGHT questions.

(2 x 8 = 16)

- i - Calculate the moles of Cl atoms in 0.822 g of  $C_2H_4Cl_2$ .
- ii - What is the difference between gram atom and gram ion?
- iii - No individual neon atom has a mass of 20.18 amu. Why?
- iv - How does the respiration process involve Dalton's law of partial pressures?
- v - Give the quantitative definition of Charles's law.
- vi - Where is plasma found?
- vii - What is Moseley's law? Give its significance.
- viii - Write down the electronic configuration of  $_{29}Cu$  and  $_{19}K$ .
- ix - The velocities of electrons in higher orbits are less than those in lower orbits of hydrogen atom. Give the reason.
- x - Define standard enthalpy of combustion. Give an example.
- xi - What is meant by state function? Give two examples.
- xii - Define exothermic reaction. Give an example.

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3. Write short answers to any EIGHT questions.

(2 x 8 = 16)

- i - Define water of crystallization. Give example.
- ii - How do you justify that the boiling point of one molal urea solution is  $100.52^\circ C$  but the boiling point of two molal urea solution is less than  $101.04^\circ C$ ?
- iii - Give two statements of Raoult's law.
- iv - Differentiate between fast step and the rate determining step.
- v - What are enzymes? Give an example.
- vi - The reaction happens due to collisions among the molecules but all the collisions are not fruitful. Justify it.
- vii - How does a Gooch crucible increase the rate of filtration?
- viii - Give the main characteristics of the solvent used for crystallization.
- ix - What is ether extraction?
- x - Define polymorphism. Give example.
- xi - Hydrogen bonding is present in chloroform and acetone. Justify it.
- xii - How liquid crystals can act as temperature sensors?

4. Write short answers to any SIX questions.

(2 x 6 = 12)

- i - Atomic radius decreases from left to right in a period, justify.
- ii - Define electron affinity, give one example.
- iii - How the criteria of electronegativity helps us to understand the nature of bond?
- iv - What is buffer capacity?
- v - Value of  $pK_a$  and  $pK_b$  are related to strength of acid and bases. Justify it.
- vi - Define solubility product with an example.
- vii - Differentiate between electrolytic and galvanic cell.
- viii - What is electrolysis? Give an example.
- ix - How anodized aluminium is prepared in an electrolytic cell?

(Turn Over)

SECTION - II

Note: Attempt any THREE (3) questions.

5. (a) What is limiting reactant? Give two examples. How limiting reactant can be identified? (1+1+2=4) (4)  
(b) What pressure is exerted by a mixture of 2.00 g of  $H_2$  and 8.00 g of  $N_2$  at 273 K in a  $10\text{ dm}^3$  vessel? (4)
6. (a) What are covalent solids? Explain their properties. (4)  
(b) Explain the Born Haber cycle for the measurement of lattice energy of NaCl. (4)
7. (a) Write down measurement of charge on electron by Millikan's Oil Drop Method. (4)  
(b) The solubility of  $CaF_2$  in water at  $25^\circ C$  is found to be  $2.05 \times 10^{-4}$  mole  $dm^{-3}$ . What is the value of KSP at this temperature? (4)
8. (a) Draw energy level diagram of  $N_2$  with reference to molecular orbital theory and explain magnetic behaviour. (4)  
(b) Describe fuel cell in detail with diagram. (4)
9. (a) Define solubility curves and explain discontinuous solubility curves with two examples. (4)  
(b) Give four characteristics of enzyme catalysis. (4)

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