Subject: Chemistry **SET B** **F.M. : 75**
Time : 3:00 hrs. **P.M : 30**

Group 'A'

Choice the best answer. **[11×1=11]**

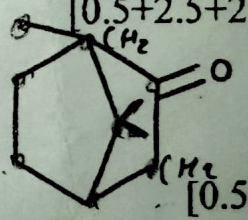
1. The IUPAC name of CH_3COCl is
   a. Acetyl chloride b. methyl chloride
   c. ethanoyl chloride d. methanoyl chloride
2. The octane number of n-nonane is
   a. -45 b. 0 c. 100 d. 125
3. On descending a group in the periodic table,
   a. Electronegativity of element increases
   b. Ionization energy of element increases
   c. Metallic character of elements increases
   d. Size of elements decreases
4. Which has the highest second ionization potential?
   a. Nitrogen b. Oxygen c. Carbon d. Fluorine
5. In the nitrate test, which of the following gives brown ring with ferrous sulphate?
   a. NO b. N_2O c. NO_2 d. N_2O_5
6. Heavy hydrogen is used as
   a. In filling the balloons
   b. In studying the mechanism of various reactions
   c. In calculating heat of formation
   d. As an oxidizing agent
7. A real gas most closely approaches the behaviour of an ideal gas at
   a. 15 atm. and 200 K c. 0.5 atm. and 500 K
   b. 1 atm. and 273 K d. 15 atm. and 500 K
8. Molecular mass of SO_2 gas is 4 times than CH_4 therefore
   a. Being SO_2 and CH_4 both gases, they diffuse with same rate
   b. SO_2 gas will diffuse 4 times faster than that of CH_4
   c. Diffusion of SO_2 gas is half than that of CH_4
   d. CH_4 gas diffuse 4 times faster than SO_2
9. Viscosity of liquid ..... with rise in temperature
   a. increase b. decrease
   c. remains constant d. is independent
10. What is the volume of 8 g of Oxygen at 27 °C and 0.5 atm pressure
    a. 11.2 lit. b. 22.4 lit. c. 12.3 lit. d. 14.5 lit.

11. Pressure cooker reduces cooking time because
    a. The heat is more easily distributed
    b. The higher pressure tenderizes the food
    c. The boiling point of water is elevated
    d. A large flame is used

Group "B"

Answer the following questions: [8×5=40]

1. State Boyle's law and mention it's important application. Calculate the mass of oxygen gas whose volume is 320 mL at 17°C and 2 atm pressure. [1+1+3]
2. What is universal gas constant and calculate the value of R in L atm mol^{-1} K^{-1}. The rate of diffusion of asaturated hydroearbon (C_nH_{2n+2}) gas is 1.206 times that of SO_2 gas under identical conditions. Find the molecular mass of this gas. [1+1+3]
3. What are oxides? Why is f_2O_2 is not considered as oxide? Classify the following oxides with justifincation. [1+4]
   a) BaO b) N_2O_5 c) ZnO d) Al_2O_3
4. Write any three reaction the shows nascent hydrogen is a more powerful reducing agent than molecular hydrogen. List the uses of different isotope of hydrogen. [3+2]
5. Write short note on ring test of nitrate. What are the actions of: [1+4]
   a) Basic nature of ammonia
   b) Conc. nitric acid upon iron.
   c) dilute nitric acid upon magnesium.
   d) conc. nitric acid upon SO_2
6. Define liquid crystal and mention it's application. Water form concave meniseus and mercury form convex meniscus in the glass tube, why? [1+2+2]
7. What is homology? Write at least five characteristics of homologous series. Why organic compounds are more in numbers than inorganic compounds? [0.5+2.5+2]
8. Camphor is a waxy, colorless solid with a strong aroma.



   a) What is the functional group present in camphor? [0.5]
   b) Write the molecular formula of amphor. [0.5]
   c) Is this homocyclic or heterocyclic compound? Why? [1.0]

Group "C"

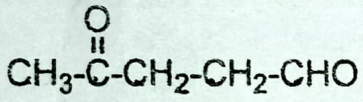
Answer the following: [8×3=24]

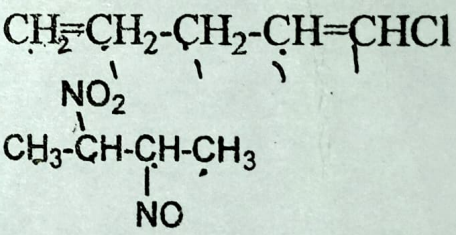
9. State and explain Charle's law with application. Avessel contains 12g of an ideal gas at t °C temperature and 1 atm pressure. When the temperature is increased by 10 °C at the same volume, the pressure increased by 10%. Calculate the volume and initial temperature. (V.P. density of gas = 60) [1+2+1+4]

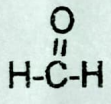
10. Define ionization energy of an element. How does it vary in the periodic table? Arrange the following ions in their increasing order of size, with, explanations. [1+2+5]
    a) $O^{-2}, F^{-}, Na^{+}, Mg^{+2}$
    b) $P^{---}, S^{--}, Cl^{-}, Ar$
    c) $Na^{+}, k^{+}, Rb^{+}, Cs^{+}$
    d) Cl^{-}, Br^{-}, I^{-}
    e) I, I^{-}, I^{+}

11. A. Draw the chemical structure of the following compounds; [3]
    a) propane nitrile
    b) Ethyl 2-methylbutanoate
    c) pent-4-enoic acid

B. Write the IUPAC name of the following structures: [3]

a. 

b. 

c. 

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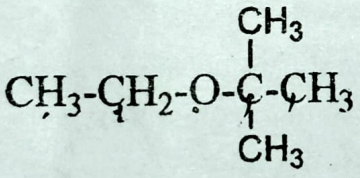
e. 

Good Luck