1. What is universal gas constant and calculate the value of R in L atm $mol^{-1}K^{-1}$. The volume of carbon monoxide gas collected over water at 25°C is 680 cc with a total pressure of 752 mm Hg. The vapour pressure of water at 25°C is 23.8 mm Hg. Determine the partial pressure of CO in container.
2. Sketch the diagram of P against 1/V and PV against V at constant temperature for verification of Boyle's law graphically. Calculate the mass of oxygen gas whose volume is 320 mL at 17°C and 2 atm pressure.
3. State Boyle's law and mention its important application. Derive PV=nRT with their usual meaning. A flask of 0.3 L capacity was weighed after it had been evacuated. It was then filled with a gas of unknown molecular mass at 1.0 atm and temperature of 300K the increase mass of flask was 0.977 g. calculate the molecular mass of the gas.
4. State and explain Graham's law of diffusion. A saturated hydrocarbon having molecular formula C_nH_{2n+2} diffuses through a porous membrane twice as fast as Sulphur dioxide. Calculate the volume occupied by the hydrocarbon at 27°C and 2 atm pressure.
5. How is ideal gas differ from real gas? A vessel contains 12g of an ideal gas at t°C and 1 atm pressure. When the temperature is increased by 10°C at the same volume, the pressure is increased by 10%. Calculate the volume and initial temperature (molecular mass of gas=120)
6. Derive an ideal equation PV=nRT where symbol have their usual meaning. A hydrocarbon CxHy has mass ratio between hydrogen and carbon is 1:10.5. one litre of the hydrocarbon at 127□ C and 1 atmospheric pressure weights 2.8gm, find the molecular formula of the hydrocarbon.
7. How did Charle's law give the concept of absolute scale temperature? Plot temperature-volume relationship indicating absolute zero. Write its important application. A spherical balloon of 21cm diameter is to be filled with hydrogen gas at NTP from cylinder containing gas at 20 atms and 27°C. If the cylinder can hold 2.82 litres of water at NTP, Calculate the number of balloons that can be filled.
8. Stat and explain Charle's law. 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)
9. What are the basic postulates of kinetic theory of gas An evacuated glass vessel weighs 50gm when empty, 148gm when filled with a liquid of density of 0.98 gm/cc and 50.5gm when filled an ideal gas at 760mm of Hg and at 300k. Determine the molecular mass of the gas.
10. Grahams law of diffusion or effusion was formulated by Scottish physical chemist Thomas Graham in 1848.This law describes the relation between density of gas and rate of diffusion.
    i. State the Graham's law of diffusion
    ii. How diffusion is differ from effusion.
    iii. How is Grahams law used in everyday life?
    iv. What volume of nitric oxide will diffuse out of a porous partition in 10 seconds when 25 ml of methane diffuse out in 4 seconds?
11. Define universal gas constant with significances. How did Charle's law give the concept of absolute scale temperature? Plot temperature-volume relationship indicating absolute zero. The rate of diffusion of a saturated hydrocarbon ($C_n H_{2n+2}$) gas is 1.206 times that of SO_2 gas under identical conditions. Find the molecular mass and the molecu formula of this gas.
12. Define the following terms:
    a. Evaporation b. Condensation c. Boiling point
    d. Vapour pressure e. Viscocity f. Surface tension
13. Write any two differences between
    a) crystalline solid and amorphous solid
    b) isotropic substance and anisotropic substance
    c) evaporation and boiling point
14. Define the following terms with suitable examples:
    a. deliquescent substances b. efflorescent substances
    c. hygroscopic substances d. water of crystallization
15. Define liquid crystal and their types with suitable examples. Mention it's any four application.
16. Explain why?
    a) Liquid drops are spherical in shape
    b) Water forms concave and mercury form convex meniscus in the glass tube.
    c) glycerin is more viscous than water
    d) Gases do no settle on the bottom of container.
    e) Evaporation takes place from the surface of liquid.
    f) Vegetables are cooked with the difficulty at a higher altitude.
17. Under what condition, real gas deviate from ideal behavior and why? A straight glass tube of length of 25cm has two inlet (A) and (B). Ammonia gas through inlet A and HCl gas through inlet B are allowed to enter the tube at the same time. White fumes of ammonium chloride is appeared at a point M inside the tube. Find the distance of point M from inlet A.
18. State and explain Dalton's law of partial pressure. When 2g of a gas (A) is introduced into a evacuated flask kept at 25°C, the pressure is found to be one atmosphere. If 3g of another gas (B) is added to the same flask, the total pressure becomes 1.5 atm at the same temperature. Assuming ideal behavior of gases, calculate the ratio of molecular mass.
19. Define efflorescent solids with example. A spherical balloon of 21 cm diameter is to be filled with hydrogen gas at NTP from a cylinder containing gas at 20 atm and 27 □. If the cylinder can hold 2.82 litres of water vapour at NTP, calculate the number of balloon that can be filled up.
20. Define surface tension of liquid. How is surface tension of a liquid originated?Two vessels of capacity 1.5 litres and 2 litres contain hydrogen gas and oxygen gas respectively under a pressure of 750 mm and 100mm. The gases are mixed together in a vessel. What will be the final pressure of mixture?
21. Define liquid crystal. Write down its applications.
22. Define deliquescent, efflorescence and hygroscopic substance with examples.
23. Define evaporation, boiling and boiling point.
24. Difference between evaporation and boiling.
25. Define surface tension and write down its unit.
26. Why alcohol has higher viscosity than honey?
27. Define crystal lattice and unit cell.
28. It is easier to wash cloth in hotter water than in colder water.
29. Difference between oxidant and reductant.
30. State and explain Faraday's first and second law of electrolysis.

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