16. Rate of diffusion of a gas is: **(1985)**

(A) directly proportional to its density

(B) directly proportional to its molecular weight

(C) directly proportional to the square root of its molecular weight

(D) inversely proportional to the square root of its molecular weight

17. Kinetic energy of a molecule is zero at $0°C$. T/F **(1985)**

18. The rate of diffusion of a gas is....... proportional to both ..... and square root of molecular mass. **(1986)**

19. The average velocity of an ideal gas molecule at $27°C$ is 0.3 m/s. The average velocity at $927°C$ will be:

(A) 0.6 m/s **(B)** 0.3 m/s **(C)** 0.9 m/s **(D)** 3.0 m/s **(1986)**

20. A spherical balloon of 21 cm diameter is to be filled up with hydrogen at NTP from a cylinder containing the gas at 20 atm and $27°C$. If the cylinder can hold 2.82 L of water, calculate the number of balloons that can be filled up. ▶ **(1987)**

21. The value of pV for 5.6 L of an ideal gas is ......RT, at NTP. **(1987)**

22. A bottle of dry ammonia and a bottle of dry hydrogen chloride connected through a long tube are opened simultaneously at both ends. The white ammonium chloride ring first formed will be: **(1988)**

(A) at the centre of the tube **(B)** near the hydrogen chloride bottle

(C) near the ammonia bottle **(D)** throughout the length of the tube

23. In van der Waals' equation of the state for a non-ideal gas, the term that accounts for intermolecular forces is: **(1988)**

(A) $(V - b)$ **(B)** RT **(C)** $\left(p + \dfrac{a}{V^2}\right)$ **(D)** $\left(RT\right)^{-1}$

24. 8 g each of oxygen and hydrogen at $27°C$ will have the total kinetic energy in the ratio of .... **(1989)**

25. A gas will approach ideal behavior at : **(1989)**

(A) low temperature and low pressure **(B)** low temperature and high pressure

(C) high temperature and low pressure **(D)** high temperature and high pressure

26. The value of van der Waals' constant a for the gases O_2, N_2, NH_3 and CH_4 are 1.360, 1.390, 4.170 and 2.253 L^2atm mol^{-2} respectively. The gas which can most easily be liquefied is : **(1989)**

(A) O_2 **(B)** N_2 **(C)** NH_3 **(D)** CH_4

27. The average velocity at T_1 K and the most probable at T_2K of CO_2 gas is 9.0×10^4 cms^{-1}. Calculate the value of T_1 and T_2 . **(1990)**

28. The density of neon will be highest at: **(1990)**

(A) STP **(B)** $0°C$, 2 atm

(C) $273°C$, 1 atm **(D)** $273°C$, 2 atm

29. Calculate the volume occupied by 5.0 g of acetylene gas at 50°C and 740 mm pressure. **(1991)**

30. According to kinetic theory of gases, for a diatomic molecule **(1991)**
   (A) the pressure exerted by the gas, is proportional to mean velocity of the molecule
   (B) the pressure exerted by the gas is proportional to the root mean velocity of the molecule
   (C) the root mean square velocity of the molecule is inversely proportional to the temperature
   (D) the mean translational kinetic energy of the molecule is proportional to the absolute temperature