KD EDUCATION ACADEMY [9582701166]

Time : 5 Hour | **STD 11 Science Physics** | **Total Marks : 280**

kd 90+ ch-12 kinetic theory of gases

*** Choose The Right Answer From The Given Options.[1 Marks Each]** **[59]**

1. The internal energy of 2 moles of a mono atomic gas is:
   (A) $\frac{3}{2}RT$ (B) $3RT$ (C) $2RT$ (D) $5RT$

2. The r.m.s velocity of oxygen molecules at 27°C is 318m/ s. the r.m.s velocity of hydrogen molecules at 127°C is:
   (A) 1470m/ s (B) 1603m/ s (C) 1869m/ s (D) 2240m/ s

3. The average kinetic energy of the molecules of a gas at 27°C is 9 10-20J. what is its average K.E. at 227°C?
   (A) 5 10-20J (B) 10 10-20J (C) 15 10-20J (D) 20 10-20J

4. Cooking gas containers are kept in a lorry moving with uniform speed. The temperature of the gas molecules inside will.
   (A) Remains the same
   (B) Decrease for some and increase for others
   (C) Decrease
   (D) Increase

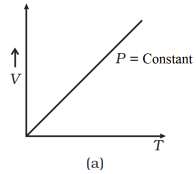
5. In equilibrium, the total energy is equally distributed in all possible energy modes having an energy equal to 1/ 2KB T, this is called as:
   (A) Boyle's law (B) Charle's law
   (C) Law of equipartition of energy (D) None

6. What is the ratio of specific heats for a monatomic gas?
   (A) $\frac{5}{3}$ (B) $\frac{5}{2}$ (C) $\frac{7}{5}$ (D) $\frac{9}{5}$

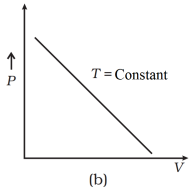
7. Latent heat of ice is:
   (A) Less than external latent heat of fusion.
   (B) More than external latent heat of fusion.
   (C) Twice the external latent heat of fusion.
   (D) Equal to external latent heat of fusion.

8. Which of the following diagrams (figure) depicts ideal gas behaviour?

(A)



(B)



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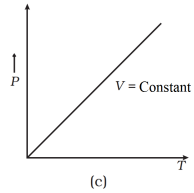
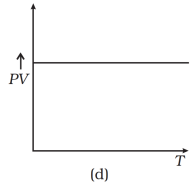


(D)



9. Temperature remaining constant, the pressure of gas is decreased by 20%. The percentage change in volume:

(A) Increases by 20% (B) Decreases by 20%

(C) Increases by 25% (D) Decreases by 25%

10. What is the number of molecules in 2.24L of SO_2 at STP?

(A) 6.023×10^{23} (B) 6.023×10^{22}

(C) 6.023×10^{20} (D) 6.023×10^{21}

11. What is meant by mean free path?

(A) It is the average distance a molecule travels without colliding.

(B) Average distance between 2 molecules.

(C) Average distance travelled by a molecule before colliding with a wall of the container.

(D) Sum of distance travelled by all molecules.

12. A man is climbing up a spiral type of staircase. His degrees of freedom are:

(A) 1 (B) 2 (C) 3 (D) More than 3

13. The value of C_V for solids is:

(A) 3R (B) 2 (C) 4R (D) $\frac{3}{2}\mathrm{R}$

14. If C_P, C_V are molar specific heats of a solid and R is universal gas constant, then:

(A) $C_P - C_V = R$ (B) $C_P - C_V, = 0$

(C) $C_P - C_V$ is negative (D) $(C_P - C_V) << R$

15. The velocity of the molecules of a gas at temperature 120K is v. At what temperature will the velocity be 2v?

(A) 120K (B) 240K (C) 480K (D) 1120K

16. Law of equipartition of energy is used to:

(A) Predict the specific heats of gases. (B) Predict the specific heats of solids.

(C) Both (a) and (b). (D) Neither (a) nor (b).

17. We took two separate gases with the same number densities for both. If the ratio of the diameters of their molecules is 4 : 1, then ratio of their mean free paths is:

(A) 1 : 4 (B) 4 : 1 (C) 2 : 1 (D) 1 : 16

18. Liquids have:

(A) Fixed shape and volume. (B) Variable shape and volume.

(C) Variable shape but fixed volume. (D) Fixed shape but variable volume.

19. The deviation of gases from the behaviour of ideal gas is due to:

(A) Attraction of molecules (B) Absolute scale of temp

(C) Covalent bonding of molecules (D) Colourless molecules

20. When 20 cal of heat is supplied to a system, the increase in internal energy is 50J. If the external work done is 35J, the mechanical equivalent of heat is:

(A) 4.25J/ cal (B) 1.26J/ cal

(C) 4.92J/ cal (D) 2.1J/ cal

21. What is the mass of 22.4L of CO_2 at STP?

(A) 1g (B) 44g (C) 44kg (D) 1kg

22. How many degrees of freedom are there in a monatomic gas?

(A) 1 (B) 2 (C) 3 (D) 0

23. The molar specific heat at constant pressure of an ideal gas is $\left(\frac{7}{2}\mathrm{R}\right)$. The ratio of specific heat at constant pressure to that at constant volume is:

(A) $\frac{9}{7}$ (B) $\frac{7}{5}$ (C) $\frac{5}{7}$ (D) $\frac{8}{7}$

24. According to the kinetic theory of gases, the temperature of a gas is a measure of average:

(A) Velocities of its molecules. (B) Linear momenta of its molecules.

(C) Kinetic energies of its molecules. (D) Angular momenta of its molecules.

25. The rms speed of oxygen at room temperature is about 500m/ s. The rms speed of hydrogen at the same temperature is about:

(A) $125ms^{-1}$ (B) $2000ms^{-1}$ (C) $8000ms^{-1}$ (D) $31ms^{-1}$

26. One mole of ideal gas required 207J heat to rise the temperature by 10°K when heated at constant pressure. If the same gas is heated at constant volume to raise the temperature by the same 10°K the heat required is (R = 8/ 3J/ mole°K)

(A) 1987J (B) 29J (C) 215.3J (D) 124J

27. K.E. of gas molecules is zero at:

(A) 0°C (B) 273°t

(C) -273°C (D) None of the above

28. A rigid container of negligible heat capacity contains one mole of an ideal gas. The temperature of the gas increases by 1°C if 3.0cal of heat is added to it. The gas may be:

(A) Helium. (B) Argon.

(C) Oxygen. (D) Carbon dioxide.

29. The total energy of water molecule is given by:

(A) 8RT (B) 3RT (C) 9RT (D) RT

30. Moon has no atmosphere because:

(A) It is far away form the surface of the earth.

(B) Its surface temperature is 10°C.

(C) The r.m.s. velocity of all the gas molecules is more then the escape velocity of the moons surface.

(D) The escape velocity of the moons surface is more than the r.m.s velocity of all molecules.

31. During an adiabatic process, the pressure of a gas is found to be proportional to the cube of its temperature. The ratio of $\frac{\mathrm{C_P}}{\mathrm{C_V}}$ for the gas is:

(A) $\frac{4}{3}$ (B) 2 (C) $\frac{5}{3}$ (D) $\frac{3}{2}$

32. The temperature of the mixture of one mole of helium and one mole of hydrogen is increased from 0°C to 100°C at constant pressure. The amount of heat delivered will be:

(A) 600 cal (B) 1200 cal (C) 1800 cal (D) 3600 cal

33. The Brownian Motion was discovered by the scientist:

(A) Albert Brown (B) John Brown

(C) Robert Brown (D) Isaac Brown

34. There are 3 non-interacting ideal gases in a container. The moles of gases 1, 2 & 3 are in the ratio 1:3:5. If the total pressure is 54Pa, find the value of partial pressure of gas 1.

(A) 6Pa (B) 12Pa (C) 18Pa (D) 28Pa

35. A diatomic molecule has how many degrees of freedom:

(A) 3 (B) 4 (C) 5 (D) 6

36. Calculate the RMS velocity of molecules of a gas of which the ratio of two specific heats is 1.42 and velocity of sound in the gas is 500m/ s:

(A) 727m/ s (B) 527m/ s

(C) 927m/ s (D) 750m/ s

37. At constant temperature, pressure is inversely proportional to volume is called as:

(A) Charle's law (B) Boyle's law

(C) Zeroth law of thermodynamics (D) First law of thermodynamics

38. Boyle's law is applicable for an:

(A) Diabatic process. (B) Isothermal process.

(C) Isobaric process. (D) Isochoric process.

39. Which of the following gases has maximum rms speed at a given temperature?

(A) Hydrogen. (B) Nitrogen.

(C) Oxygen. (D) Carbon dioxide.

40. The speed of sound in a gas is v. The rms speed of molecules of this gas is C. If $\gamma = \frac{C_p}{C_v}$, then the ratio of v and C is:

(A) $\frac{3}{\gamma}$ (B) 0.33γ (C) $\sqrt{\frac{3}{\gamma}}$ (D) $\sqrt{\frac{\gamma}{3}}$

41. A gas is taken in a sealed container at 300K. it is heated at constant volume to a temperature 600K. the mean K.E. of its molecules is:

(A) Halved (B) Doubled (C) Tripled (D) Quadrupled

42. What is the ratio of densities of 2 gases, O_2 & N_2, having partial pressures in the ratio 2:3?

(A) $\frac{16}{21}$ (B) $\frac{12}{7}$ (C) $\frac{21}{16}$ (D) $\frac{7}{12}$

43. The total internal energy of the monoatomic gas molecule is given by:

(A) $\frac{1}{2}RT$ (B) $\frac{5}{2}RT$ (C) $\frac{3}{2}RT$ (D) RT

44. The total internal energy of a mole of diatomic gas is given by:

(A) $\frac{5}{3}RT$ (B) $\frac{5}{2}R$ (C) $\frac{5}{2}RT$ (D) $\frac{3}{2}RT$

45. A container has 3 gases whose mass ratio is 1:3:5. What is the ratio of mean square speed of the molecules of two gases? Their atomic masses are 20u, 30u & 40u corresponding to the order in which the ratios are given.

(A) $2:3:4$ (B) $4:3:2$

(C) $2:\sqrt{3}:\sqrt{2}$ (D) $\sqrt{2}:\sqrt{3}:2$

46. A room temperature the r.m.s. velocity of the molecules of a certain diatomic gas is found to be 1930m/ sec. the gas is:

(A) H^2 (B) F^2 (C) O^2 (D) Cl^2

47. According to law of equipartition of energy, in equilibrium the tot energy is equally distributed in all possible energy modes having an energy equal to:

(A) $\frac{3}{2}KBT$ (B) $\frac{1}{2}KBT$ (C) KBT (D) $\frac{5}{2}KBT$

48. For hydrogen gas, $C_p - C_v = b$. The relation between a and b is:

(A) a = 16b (B) b = 16 (C) a = b (D) a = 4b

49. The two gases with the ratio 3 : 2 of their masses in a container are at a temperature T. The ratio of the kinetic energies of the molecule of two gases is:

(A) 3 : 2 (B) 9 : 4 (C) 1 : 1 (D) 4 : 9

50. What is the ratio of specific heats for a diatomic gas?

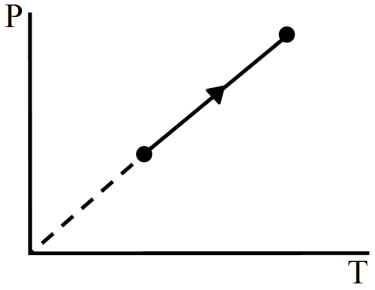
(A) $\frac{7}{5}$ (B) $\frac{5}{3}$ (C) $\frac{9}{7}$ (D) $\frac{7}{2}$

51. The pressure P of a gas and its mean K.E. per unit volume are related as:

(A) $P=\frac{1}{2}E$ (B) $P=E$ (C) $P=\frac{3}{2}E$ (D) $P=\frac{2}{3}E$

52. The process on an ideal gas, shown in figure. is:

a. Isothermal.
b. Isobaric.
c. Isochoric.
d. None of these.



53. The rms speed of oxygen at room temperature is about 500m/ s. The rms speed of hydrogen at the same temperature is about:

a. $125ms^{-1}$
b. $2000ms^{-1}$
c. $8000ms^{-1}$
d. $31ms^{-1}$

54. Which of the following gases has maximum rms speed at a given temperature?

a. Hydrogen.
b. Nitrogen.
c. Oxygen.
d. Carbon dioxide.

55. The quantity $\frac{PV}{kT}$ represents:

a. Mass of the gas.

b. Kinetic energy of the gas.
c. Number of moles of the gas.
d. Number of molecules in the gas.

56. The mean square speed of the molecules of a gas at absolute temperature T is proportional to:
a. $\frac{1}{T}$
b. $\sqrt{T}$
c. T
d. T^2

57. Vapour is injected at a uniform rate in a closed veseel which was initially evacuated. The pressure in the vessel:
a. Increaaes continuously.
b. Decreases continuously.
c. First increases and then decreases.
d. First increases and then becomes constant.

58. The average momentum of a molecule in a sample of an ideal gas depends on:
a. Temperature.
b. Number of moles.
c. Volume.
d. None of these.

59. There is some liquid in a closed bottle. The amount of liquid is continuously decreasing. The vapour in the remaining part:
a. Must be saturated.
b. Must be unsaturated.
c. May be saturated.
d. There will be no vapour.

*** Answer The Following Questions In One Sentence.[1 Marks Each] [5]**

60. A ball is dropped on a floor from a height of 2.0m. After the collision it rises up to a height of 1.5m. Assume that 40% of the mechanical energy lost goes as thermal energy into the ball. Calculate the rise in the temperature of the ball in the collision. Heat capacity of the ball is $800JK^{-1}$.

61. A 50kg man is running at a speed of $18kmh^{-1}$. If all the kinetic energy of the man can be used to increase the temperature of water from 20°C to 30°C, how much water can be heated with this energy?

62. The ratio of vapour densities of two gases at the same temperature is 6 : 9. Compare the r.m.s. velocities of their molecules.

63. Consider a gas of neutrons. Do you expect it to behave much better as an ideal gas as compared to hydrogen gas at the same pressure and temperature?

64. Calculate the volume of 1 mole of an ideal gas at STP.

*** Given Section consists of questions of 2 marks each. [6]**

65. Find the average magnitude of linear momentum of a helium molecule in a sample of helium gas at 0°C. Mass of a helium molecule = 6.64×10^{-27}kg nd Boltzmann constant

$= 1.38 \times 10^{-23} JK^{-1}$.

66. The temperature and the dew point in an open room are 20°C and 10°C. If the room temperature drops to 15°C, what will be the new dew point?

67. The weather report reads, "Temperature 20°C : Relative humidity 100%". What is the dew point?

*** Given Section consists of questions of 3 marks each. [63]**

68. A flask contains argon and chlorine in the ratio of $2:1$ by mass. The temperature of the mixture is $27C$. Obtain the ratio of (i) average kinetic energy per molecule, and (ii) root mean square speed V_{rms} of the molecules of the two gases. Atomic mass of argon $= 39.9u$; Molecular mass of chlorine $= 70.9u$.

69. Two perfect gases at absolute temperatures T_1 and T_2 are mixed. There is no loss of energy. Find the temperature of the mixture if the masses of the molecules are m_1 and m_2 and the number of the molecules in the gases are n_1 and n_2 respectively.

70. The volume of air bubble increases 15 times when it rises from bottom to the top of a lake. Calculate the depth of the lake if density of lake water is $1.02 \times 10^3 kg/m^3$ and atmospheric pressure is 75cm of mercury.

71. The condition of air in a cloeed room is described as follows. Temperature = 25°C, relative humidity = 60%, pressure = 104kPa. lf all the water vapour is removed from the room without changing the temperature, what will be the new pressure? The saturation vapour pressure at 25°C = 3.2kPa.

72. Find the kinetic energy of 1g of nitrogen gas at 77°C. Given, $R = 8.31 J\text{-}mol^{-1}K^{-1}$.

73. Calculate (i) r.m.s. velocity and (ii) mean kinetic energy of one gram molecule of hydrogen at S.T.P. Given density of hydrogen at S.T.P. is $0.09 kg\text{-}m^{-3}$.

74. A vessel is filled with a gas at a pressure of 76cm of Hg at a certain temperature. The mass of the gas is increased by 50% by introducing more gas in the vessel at the same temperature. Find out the resultant pressure of the gas.

75. The velocities of ten particles in ms^{-1} are 0, 2, 3, 4, 4, 4, 5, 5, 6, 9. Calculate (i) Average speed and (ii) r.m.s. speed.

76. Two moles of gas A at 27°C are mixed with 3 moles of gas B at 37°C. If both are monoatomic ideal gases, what will be the temperature of the mixture?

77. Two ideal monoatomic gases A and B at 27°C and 37°C are mixed. The number of moles in gas A are 2 and number of moles in gas B are 3. What will be the temperature of the mixture?

78. Explain the pressure exerted by an ideal gas and also find the average kinetic energy per molecule of the gas.

79. If one mole of ideal monoatomic gas $\left(\gamma = \frac{7}{5}\right)$ is mixed with one mole of diatomic gas $\left(\gamma = \frac{7}{5}\right)$. What is the value of y for the mixtures? (Here, γ represents the ratio of specific heat at constant pressure to that at constant volume)

80. Calculate the root-mean square speed of oxygen molecules at 1092K. Density of oxygen at STP = $1.424 kg\text{-}m^{-3}$.

81. Three moles of an ideal diatomic gas is taken at a temperature of 300K. Its volume is doubled keeping its pressure constant. Find the change in internal energy of gas.

82. An ideal gas has a specific heat at constant pressure $C_p = \frac{5R}{2}$. The gas is kept in a closed vessel of volume 0.0083m^3 at a temperature of 300K and a pressure of 1.6 × $10^6 Nm^{-2}$. An amount of 2.49 × 10^4J of heat energy is supplied to the gas. Calculate the final temperature and pressure of the gas.

83. The temperature and relative humidity in a room are 300K and 20% respectively. The volume of the room is 50m^3. The saturation vapour pressure at 300K is 3.3kPa. Calculate the mass of the water vapour present in the room.

84. 2g of hydrogen is sealed in a vessel of volume 0.02m^3 and is maintained at 300K. Calculate the pressure in the vessel.

85. A gas cylinder has walls that can bear a maximum pressure of 1.0 × 10^6Pa. It contains a gas at 8.0 × 10^5Pa and 300K. The cylinder is steadily heated. Neglecting any change in the volume, calculate the temperature at which the cylinder will break.

86. An electric bulb of volume 250cc was sealed during manufacturing at a pressure of 10^{-3}mm of mercury at 27°C. Compute the number of air molecules contained in the bulb. Avogadro constant = 6 × $10^{23} mol^{-1}$, density of mercury = 13600kg/ m^{-3} and g = 10ms^{-2}.

87. Equal masses of air are sealed in two vessels, one of volume V_0 and the other of volume $2V_0$. If the first vessel is maintained at a temperature 300K and the other at 600K, find the ratio of the pressures in the two vessels.

88. At what temperature the mean speed of the molecules of hydrogen gas equals the escape epeed from the earth?

*** Given Section consists of questions of 5 marks each. [135]**

89. At what temperature is the root mean square speed of an atom in an argon gas cylinder equal to the rms speed of a helium gas atom at-20°C? (atomic mass of Ar = 39.9u, of He = 4.0u).

90. An oxygen cylinder of volume 30 litres has an initial gauge pressure of 15 atm and a temperature of 27°C. After some oxygen is withdrawn from the cylinder, the gauge pressure drops to 11 atm and its temperature drops to 17°C. Estimate the mass of oxygen taken out of the cylinder (R = 8.31J $mol^{-1}K^{-1}$, molecular mass of O_2 = 32u).

91. An air bubble of volume 1.0cm^3 rises from the bottom of a lake 40m deep at a temperature of 12°C. To what volume does it grow when it reaches the surface, which is at a temperature of 35°C?

92. Consider a rectangular block of wood moving with a velocity v_0 in a gas at temperature T and mass density ρ. Assume the velocity is along x-axis and the area of cross-section of the block perpendicular to v0 is A. Show that the drag force on the block is $4\rho\, A v_0 \sqrt{\frac{KT}{m}}$ where m is the mass of the gas molecule.

93.
   i. Define mean free path.
   ii. Derive an expression for mean free path of a gas molecule.

94. A flask contains argon and chlorine in the ratio of 2 : 1 by mass. The temperature of the mixture is 27°C. Obtain the ratio of (i) average kinetic energy per molecule, and (ii) root mean square speed v_{rms} of the molecules of the two gases. Atomic mass of argon = 39.9u; Molecular mass of chlorine = 70.9u.

95. 0.040g of He is kept in a closed container initially at 100.0°C. The container is now heated. Neglecting the expansion of the container, calculate the temperature at which the internal energy is increased by 12J.

96. The temperature and pressure at Simla are 15.0°C and 72.0cm of mercury and at Kalka these are 35.0°C and 76.0cm of mercury. Find the ratio of air density at Kalka to the air density at Simla.

97. A balloon partially filled with Helium has a volume of $30m^3$, at the earth's surface, where pressure is 76cm of Hg and temperature is 27°C. What will be the increase in volume of gas if balloon rises to a height, where pressure is 7.6cm of Hg and temperature is -54°C?

98. An air bubble of radius 2.0mm is formed at the bottom of a 3.3m deep river. Calculate the radius of the bubble as it comes to the surface. Atmospheric pressure = 1.0×10^5 Pa and density of water = $1000kg/m^{-3}$.

99. State the law of equipartition of energy of a dynamic system and use it to find the values of internal energy and the ratio of the specific heats of (a) monoatomic, (b) diatomic, (c) triatomic gas molecules.

100. An ideal gas is kept in a long cylindrical vessel fitted with a frictionless piston of cross-sectional area $10cm^2$ and weight 1kg. The length of the gas column in the vessel is 20cm. The atmospheric pressure is 100kPa. The vessel is now taken into a spaceship revolving round the earth as a satellite. The air pressure in the spaceship is maintained at 100kPa. Find the length of the gas column in the cylinder.

101. Two molecules of a gas have speeds of 9×10^{16} ms^{-1} and $1 \times I0^6$ ms^{-1} respectively. What is the root mean square speed of these molecules?

102. A gaseous mixture contains 16g of helium and 16g of oxygen, then calculate the ratio of $\frac{C_p}{C_V}$ of the mixture.

103. A gas mixture consists of 2.0 moles of oxygen and 4.0 moles of neon at temperature T. Neglecting all vibrational modes, calculate the total internal energy of the system. (Oxygen has two rotational modes.)

104. Two molecules of a gas have speeds of 9×10^{16} ms^{-1} and $1 \times I0^6$ ms^{-1} respectively. What is the root mean square speed of these molecules?

105. A ballon has 5.0g mole of helium at 7°C. Calculate.
   a. The number of atoms of helium in the balloon,
   b. The total internal energy of the system.

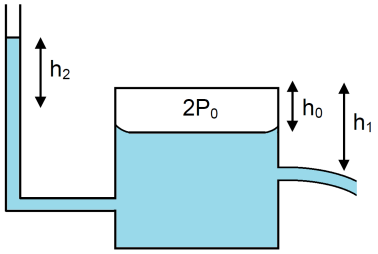
106. Explain why. There is no atmosphere on moon.

107. Consider a rectangular block of wood moving with a velocity v_0 in a gas at temperature T and mass density ρ. Assume the velocity is along x-axis and the area of cross-section of the block perpendicular to v0 is A. Show that the drag force on the block is $4\rho\, A v_0 \sqrt{\frac{KT}{m}}$ where m is the mass of the gas molecule.

108. We have 0.5g of hydrogen gas in a cubic chamber of size 3cm kept at NTP. The gas in the chamber is compressed keeping the temperature constant till a final pressure of 100atm. Is one justified in assuming the ideal gas law, in the final state? (Hydrogen molecules can be consider as spheres of radius 1 A).

109. Figure. shows a large closed cylindrical tank containing water. Initially the air trapped above the water surface has a height h_0 and pressure $2p_0$ where p_0 is the atmospheric pressure. There is a hole in the wall of the tank at a depth h_1 below the top from which water comes out. A long vertical tube is connected as shown.

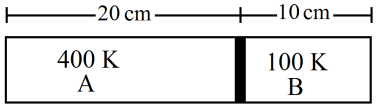
a. Find the height h_2 of the water in the long tube above the top initially.
b. Find the speed with which water comes out of the hole.
c. Find the height of the water in the long tube above the top when the water stops coming out of the hole.



110. A bucket full of water is placed in a room at 15°C with initial relative humidity 40%. The volume of the room is $50m^3$.

a. How much water will evaporate?
b. If the room temperature is increased by 5°C, how much more water will evaporate? The saturation vapour pressure of water at 15°C and 20°C are 1.6kPa and 2.4kPa respectively.

111. Figure. shows a cylindrical tube of length 30cm which is partitioned by a tight-fitting separator. The separator is very weakly conducting and can freely slide along the tube. Ideal gases are filled in the two parts of the vessel. In the beginning, the temperatures in the parts A and B are 400K and 100K respectively. The separator slides to a momentary equilibrium position shown in the figure. Find the final equilibrium position of the separator, reached after a long time.



112. Air is pumped into the tubes of a cycle rickshaw at a pressure of 2 atm. The volume of each tube at this pressure is $0.002m^3$. One of the tubes gets punctured and the volume of the tube reduces to $0.0005m^3$. How many moles of air have leaked out? Assume that the temperature remains constant at 300K and that the air behaves as an ideal gas.

113. The temperature and pressure at Simla are 15.0°C and 72.0cm of mercury and at Kalka these are 35.0°C and 76.0cm of mercury. Find the ratio of air density at Kalka to the air density at Simla.

114. The temperature and humidity of air are 27°C and 50% on a particular day. Calculate the amount of vapour that should be added to 1 cubic metre of air to saturate it. The saturation vapour pressure at 27°C = 3600Pa.

115. Air is pumped into an automobile tyre's tube up to a pressure of 200kPa in the morning when the air temperature is 20°C. During the day the temperature rises to

40°C and the tube expands by 2%. Calculate the pressure of the air in the tube at this temperature.

* Case study based questions [12]

116. On a winter day, the outside temperature is 0°C and relative humidity 40%. The air from outside comes into a room and is heated to 20°C. What is the relative humidity in the room? The saturation vapour pressure at 0°C is 4.6mm of mercury and at 20°C it is 18mm of mercury.

117. The human body has an average temperature of 98°F. Assume that the vapour pressure of the blood in the veins behaves like that of pure water. Find the minimum atmospheric pressure which is necessary to prevent the blood from boiling. Use

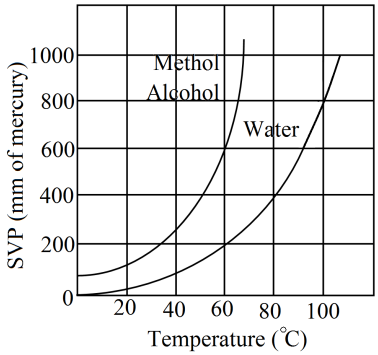


figure. of the text for the vapour pressures.

118. On a winter day, the outside temperature is 0°C and relative humidity 40%. The air from outside comes into a room and is heated to 20°C. What is the relative humidity in the room? The saturation vapour pressure at 0°C is 4.6mm of mercury and at 20°C it is 18mm of mercury.

----- "Itni shiddat se maine tumhe (success) paane ki koshish ki hai,ki har zarre ne mujhe tumse milane ki saazish ki hai -----