Chapter – 13
KINETIC THEORY OF GASES

One mark questions (PART – A):

1. Define mean free path.(K)
2. Mention the important property of the interatomic force.(U)
3. What is Avogadro number?(U)
4. What is an ideal gas.(K)
5. Mention the condition at which gas behaves like an ideal one.(A)
6. State Boyle's law.(K)
7. State Charles's law.(K)
8. Write the ideal gas equation for a mixture of 'n' number of non-interacting ideal gases.(K)
9. State the Dalton's law of partial pressure.(K)
10. Mention the factor on which average kinetic energy of molecules depends.(U)
11. Write the expression for pressure of an ideal gas in terms of rms speed of gaseous molecule.(U)
12. Mention the factor on which internal energy of an ideal gas depends.(U)
13. How many translational degree of freedom a monatomic gas has?(A)
14. How many translational degree of freedom O_2 or N_2 has?(A)
15. State the law of equipartition of energy.(K)
16. Write the equation for molar specific heat of monatomic gas at constant volume.(U)
17. Write the equation for molar specific heat of monatomic gas at constant pressure.(U)
18. What is the ratio of specific heats of monatomic gas at constant pressure and volume?(U)
19. Write the equation for molar specific heat of rigid diatomic gas at constant volume.(U)
20. Write the equation for molar specific heat of rigid diatomic gas at constant pressure.(U)
21. What is the ratio of specific heats of rigid diatomic gas at constant pressure and volume?(U)
22. Write the equation for molar specific heat of non-rigid diatomic gas at constant volume.(U)
23. Write the equation for molar specific heat of non-rigid diatomic gas at constant pressure.(U)
24. What is the ratio of specific heats of non-rigid diatomic gas at constant pressure and volume?(U)
25. Write the equation for molar specific heat of non-rigid polyatomic gas at constant volume.(U)
26. Write the equation for molar specific heat of non-rigid polyatomic gas at constant pressure.(U)
27. Write the expression for degrees of freedom of a molecule in terms of degrees of freedom.(U)

Two mark questions (PART – B):

1. Write the perfect gas equation and explain the terms.(U)
2. Mention the expression for average kinetic energy of molecules in terms of absolute temperature and explain the terms.(U)
3. Mention the two factors on which internal energy of an ideal gas do not depend.(A)
4. Write the expression for internal energy of an ideal gas in terms of absolute temperature and explain the terms.(U)
5. Write the expression of average energy of a monatomic molecule and explain the terms.(U)
6. Write the expression of total internal energy of a mole of monatomic gas and explain the terms.(U)

7. Write the expression of total internal energy of a mole of rigid diatomic gas and explain the terms.(U)
8. Write the expression of total internal energy of a mole of non-rigid diatomic gas and explain the terms.(U)
9. Write the expression of total internal energy of a mole of non-rigid polyatomic gas and explain the terms.(U)
10. Write the expression of total internal energy of a mole of solid and explain the terms.(U)
11. Write the expression of total internal energy of a mole of water gas and explain the terms.(U)
12. Mention the expression of mean free path of gas molecules in a gas and explain the terms.(U)
13. Mention two factors on which mean free path of a gas molecule in a gas depend.(A)

Three mark questions (PART – C):

1. Deduce the equation for pressure for a mixture of 'n' number of non-interacting ideal gas at constant volume and temperature.(U)
2. Deduce the expression for specific heat capacity of solid in terms of universal gas constant.(U)
3. Derive the expression for specific heat of water in terms of universal gas constant.(U)

Five mark questions (PART – D):

1. Derive the relation $P = (1/3)mn\bar{v}^2$ using kinetic theory of gases.(U & S)
2. Derive the expression for mean free path of gas molecules in a gas.(U & S)