HEAT AND THERMODYNAMICS

Each question has four possible answers, encircled the correct answer:

1. The degree of hotness or coldness of an object is called:

(a) Temperature **(b)** Chemical energy

(c) Mechanical energy **(d)** Heat

2. Temperature is a property that determines:

(a) The ability of a body to transfer heat **(b)** A body with lower thermal conductivity

(c) A body with higher thermal conductivity **(d)** How much energy is present in the body

3. Something which flows from a hot body to a cold body is known as:

(a) Heat **(b)** Internal energy

(c) Temperature **(d)** None of these

4. The direction of the flow of heat between two bodies depends upon:

(a) Thermal conductivity **(b)** Internal energies

(c) Temperature **(d)** Specific heat

5. The branch of physics which deals with the transfer of heat into other form of energy is called:

(a) Heat and temperature **(b)** Thermodynamics

(c) Mechanics **(d)** All of above

6. Sum of all forms of molecular energies of a substance is called its:

(a) External energy **(b)** Kinetic energy

(c) Potential energy **(d)** Internal energy

7. A relationship between the mechanical work and heat energy has derived by:

(a) Joule **(b)** Newton

(c) Kelvin **(d)** Einstien

8. The pressure of a gas is defined as:

(a) Force per unit area **(b)** Mass per unit volume

(c) Energy per unit volume **(d)** Energy per unit area

9. Pressure of a gas depends upon:

(a) The mass of molecules **(b)** Molecular speed

(c) Number of molecules **(d)** All of above

10. When a gas is compressed:

(a) Its temperature decreases **(b)** Its internal energy decreases

(c) Its temperature increases **(d)** None of these

11. The pressure exerted by the gas molecules on the walls of the vessel is due to:

(a) Continuous collision of its molecules **(b)** Free motion of its molecules

(c) Momentum of its molecules **(d)** All of above

12. Select the statement that agrees the kinetic molecular theory of gases:

(a) Molecules of a gas suffer elastic collisions

(b) There are large number of molecules in a finite volume

(c) Molecules do not exert force except during collision

(d) All of the above

13. The expression for pressure exerted by an ideal gas is given by:

(a) $P = \frac{1}{3} N_0 < \frac{1}{2} mv^2 >$ **(b)** $P = \frac{1}{2} N_0 < \frac{1}{2} mv^2 >$

(c) $P = \frac{2}{3} N_0 < \frac{1}{2} mv^2 >$ **(d)** $P = \frac{2}{3} N_A < \frac{1}{2} mv^2 >$

14. Mean square velocity of gas molecules moving along x-direction is represented by:

(a) $< V_y^2 >$ **(b)** $< V_x^2 >$

(c) $< V_z^2 >$ **(d)** None of these

15. The Boltzman constant K in terms of universal gas constant R and Avogadro's number N_A is:

(a) $K = \frac{R}{N_A}$ **(b)** $K = \frac{N_A}{R}$

(c) $K = \frac{NR}{N_A}$ **(d)** None of these

16. The value of Boltzman gas constant K is:

(a) $1.38 \times 10^{-34}\ J.K^{-1}$ **(b)** $1.38 \times 10^{-23}\ JK^{-1}$

(c) $1.38 \times 10^{-32}\ J\text{-}K^{-1}$ **(d)** $1.38 \times 10^{-27}\ J\ .\ K^{-1}$

17. The average translational kinetic energy per molecule of an ideal gas is given by:

(a) $\frac{3RT}{2N_A}$ **(b)** $\frac{2RT}{3N_A}$

(c) $\frac{2N_AT}{3R}$ **(d)** $\frac{3N_AT}{2R}$

18. Pressure of an ideal gas in terms of its density can be written as:

(a) $P = \rho v^2$ **(b)** $P = \frac{1}{3} \rho v^2$

(c) $P = \frac{2}{3} \rho v^2$ **(d)** $P = \frac{1}{2} \rho v^2$

19. According to the kinetic molecular theory which of the following relation is correct:

(a) $T = \frac{2N_A}{R} < \frac{1}{2} mv^2 >$ **(b)** $T = \frac{3N_A}{2R} < \frac{1}{2} mv^2 >$

(c) $T = \frac{N_A}{3R} < mv^2 >$ **(d)** $T = \frac{2N_A}{3R} < \frac{1}{2} mv^2 >$

20. The average translational kinetic energy of the molecules show itself in the form of:

(a) Viscosity **(b)** Density

(c) Velocity **(d)** Temperature

21. At constant temperature, the volume of a gas is inversely proportional to the pressure is called:

(a) Charle's law **(b)** Boyle's law

(c) Heat law **(d)** None of these

22. At constant pressure, the volume of a gas is directly proportional to the absolute temperature is called:

(a) Charle's law **(b)** Boyle's law

(c) Heat law **(d)** None of these

23. Under the same conditions of temperature and pressure, equal volume of all gases contains the same number of kilo moles is called:

(a) Charle's law **(b)** Boyle's law

(c) Avogadro's law **(d)** Law of pressure

24. The mathematical form of an ideal gas laws is:

(a) $PV = nRT$ **(b)** $PT = nRv$

(c) $PV = \frac{nR}{T}$ **(d)** $TV = nRP$

25. The value of universal gas constant R is:

(a) 8314 J / mole-K **(b)** 83.10 J/mole-K

(c) 8314 J / K-mole K **(d)** 8.314 J/K mole-K

26. The unit of pressure of gas is:

(a) N/m^2 **(b)** Pascal

(c) Atmosphere **(d)** All of these

27. Avogadro's number is known as the number of molecules in:

(a) One mole of a substance **(b)** Total volume of a substance

(c) Unit volume of substance **(d)** One kg of a substance

28. At constant pressure, the graph between volume and absolute temperature is:

(a) Parabola **(b)** Straight line

(c) Hyperbola **(d)** None of these

29. At constant temperature, the graph between volume and pressure is:

(a) Parabola **(b)** Straight line

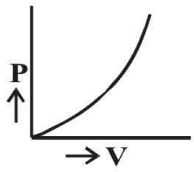
(c) Hyperbola **(d)** None of these

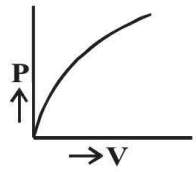
30. For a gas obeying Boyle's law if pressure is doubled, the volume of a gas becomes:

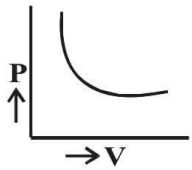
(a) One half **(b)** No change

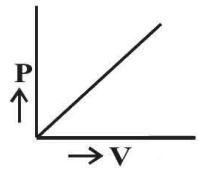
(c) Double **(d)** None of these

31. Which of the following curves represents Boyle's law:

(a) 

(b) 

(c) 

(d) 

32. Mathematically Boyle's law can be written as:

(a) $PV = \text{Constant}$ **(b)** $\frac{P}{V} = \text{Constant}$

(c) $\frac{V}{P} = \text{Constant}$ **(d)** None of these

33. Mathematically, Charle's law can be written as:

(a) $T.V = \text{Constant}$ **(b)** $\frac{V}{T} = \text{Constant}$

(c) $\frac{T}{V} = \text{Constant}$ **(d)** None of these

34. A diatomic gas contains only:

(a) Translational K.E **(b)** Rotational K.E

(c) Vibrational K.E **(d)** All of these

35. Boyle's law is an example of:

(a) Isothermal process **(b)** Adiabatic process

(c) Mechanical process **(d)** None of these

36. The pressure of a gas is directly proportional to:

(a) Root mean square velocity of the molecules

(b) Mean square velocity of the molecules

(c) Mean velocity of the molecules

(d) None of these

37. Gas law $PV^{\gamma} = \text{Constant}$ is for:

(a) Isothermal process **(b)** Adiabotic process

(c) Isobaric process **(d)** Iso choric process

38. The ratio of universal gas constant and Avogadro's number is called:

(a) Universal constant **(b)** Boltzmann constant

(c) Equilibrium constant **(d)** None of these

39. Which one of the following gases is the nearest approach to an ideal gas:

(a) Oxygen **(b)** Nitrogen

(c) Hydrogen **(d)** Carbon dioxide

40. Real gases strictly obey gas laws:

(a) At high pressure and low temperature **(b)** At low pressure and high temperature

(c) At high pressure and high temperature **(d)** At low pressure and low temperature

41. Gas constant per molecule of the gas is called:

(a) Rydberg's constant **(b)** Boltzmann's constant

(c) Stefan's constant **(d)** Molar gas constant

42. If some quantity of water put in a shallow vessel allowed to evaporate, its temperature:

(a) Decreases **(b)** Increases

(c) Remains constant **(d)** None of these

43. When we heat a substance the energy associated with its atoms / molecules is:

(a) Increased **(b)** Decreased

(c) Remains constant **(d)** Becomes zero

44. When a substance is heated, then heat is converted into:

(a) Internal energy **(b)** Initial energy

(c) External energy **(d)** Chemical energy

45. The internal energy of an ideal gas depends upon only on its:

(a) Pressure **(b)** Volume

(c) Temperature **(d)** All of above

46. Work done by the system on its environment is considered as:

(a) Zero **(b)** Positive

(c) Negative **(d)** None of these

47. Work done on the system by its environment is taken as:

(a) Zero **(b)** Positive

(c) Negative **(d)** None of these

48. Which statement about internal energy is correct:

(a) The internal energy of a system can be increased without transfer of energy by heating

(b) The internal energy of a system depends only on its temperature

(c) When the internal energy of a system is increased, its temperature always increased

(d) When two systems have the same internal energy, they must be at the same temperature

49. The sum of total energy of all the molecules of a substance is called:

(a) Heat energy **(b)** Efficiency

(c) Internal energy **(d)** Power

50. The first law of thermodynamics is a special case of the:

(a) Charle's law **(b)** Law of conservation of momentum

(c) Boyle's law **(d)** Law of conservation of energy

51. The principles which deals with the heat energy and its transformation into mechanical energy is called:

(a) Laws of thermodynamics **(b)** Law of conservation of mass

(c) Law of conservation of energy **(d)** First law of thermodynamics

52. First law of thermodynamics is the restatement of:

(a) Law of conservation of mass **(b)** Law of conservation of energy

(c) Both (a) and (b) **(d)** None of these

53. Mathematically the first law of thermodynamics can be expressed as:

(a) $Q = \Delta U + W$ **(b)** $Q = W - \Delta U$

(c) $Q = \Delta U - W$ **(d)** $W = Q + \Delta U$

54. In thermodynamics, the change in the internal energy depends upon:

(a) The initial state of temperature only

(b) The final state of temperature only

(c) The initial and final states of the temperature

(d) None of these

55. The process under which the system undergoes a change of state at constant volume is called:

(a) Adiabatic process **(b)** Isothermal process

(c) Isochoric process **(d)** Isobaric process

56. The process in which the pressure of a system remains constant is called:

(a) Isochoric process **(b)** Isobaric process

(c) Adiabatic process **(d)** Isothermal process

57. The temperature of the system remains constant is called:

(a) Isochoric process **(b)** Isothermal process

(c) Adiabatic process **(d)** Isobaric process

58. That process in which no heat enters or leaves the system is called:

(a) Isochoric process **(b)** Isothermal process

(c) Isoboric process **(d)** Adiabatic process

59. Any thing which have distinct boundaries is called:

(a) Environment **(b)** System

(c) Both (a) and (b) **(d)** None of these

60. Any thing which have no distinct boundaries is called:

(a) Environment **(b)** System

(c) Both (a) and (b) **(d)** None of these

61. A system in which there is no transfer of mass and energy across the boundary is called:

(a) An isolated system **(b)** An open system

(c) A closed system **(d)** None of these

62. A system in which there is no transfer of mass across the boundary is called:

(a) An isolated system **(b)** An open system

(c) A closed system **(d)** None of these

63. In isothermal process:

(a) $\Delta U = W$ **(b)** $\Delta U = -W$

(c) $Q = \Delta U$ **(d)** $Q = W$

64. In an adiabatic process:

(a) $\Delta Q = 0$ **(b)** $Q = W$

(c) $\Delta U = Q$ **(d)** None of these

65. An isothermal process is represented by the mathematical equation:

(a) $\frac{P}{T} = \text{Constant}$ **(b)** $\frac{V}{T} = \text{Constant}$

(c) $PV = \text{Constant}$ **(d)** $PV^{\gamma} = \text{Constant}$

66. The expression $PV^{\gamma} = \text{Constant}$ holds good in:

(a) Adiabatic process **(b)** Isothermal process

(c) Isobaric process **(d)** None of these

67. In an isothermal process, internal energy of the system:

(a) Decreases **(b)** Increases

(c) Remains constant **(d)** None of these

68. The amount of heat required to raise the temperature of one kg of a substance through 1°C is called:

(a) Specific heat **(b)** Molar heat capacity

(c) Heat of fusion **(d)** All of above

69. The amount of heat required to raise the temperature of 1 mole of a substance through 1 K is called:

(a) Heat capacity **(b)** Molar heat capacity

(c) Specific heat **(d)** None of these

70. The difference between C_P and C_V is equal to:

(a) Molar gas constant **(b)** Boltzmann constant

(c) Universal gas constant **(d)** None of these

71. The ratio $\frac{C_P}{C_V} = \gamma$ for diatomic gas like air is:

(a) 1.40 **(b)** 1.30

(c) 1.29 **(d)** 1.67

72. 1 kilo calorie is equal to:

(a) 1.17 watt-hour **(b)** 117.0 watt-hour

(c) 11.7 watt-hour **(d)** None of these

73. Mark the correct statement:

(a) Specific heat of mono-atomic gases is greater than those of poly-atomic gases

(b) Specific heat of mono-atomic gases is less than those of poly-atomic gases

(c) Specific heat of mono-atomic gases is equal to those of poly-atomic gases

(d) None of these

74. The amount of heat energy required to evaporise one kg of a liquid at its boiling without change of temperature is called:

(a) Heat of fusion **(b)** Heat capacity

(c) Heat of vaporization **(d)** Latent heat of vaporization

75. Specific heat of different substances varies because of:

(a) Different K.E of molecules of unit mass **(b)** Different number of molecules in unit mass

(c) Same number of molecules in unit mass **(d)** Same K.E of molecules of unit mass

76. A process which can be retraced in reverse order without produces any change in the environment is called:

(a) Irreversible process **(b)** Reversible process

(c) Isothermal process **(d)** Adiabatic process

77. A process which cannot be retraced in the reverse order is called:

(a) Irreversible process **(b)** Reversible process

(c) Isothermal process **(d)** Isochoric process

78. Which one is the example of irreversible process:

(a) Compton effect **(b)** Melting ice

(c) Heat engine **(d)** Work done against friction

79. Which one is the example of reversible process:

(a) Compton **(b)** Melting ice

(c) Heat engine **(d)** Workdone against friction

80. For diatomic gas $C_V = \frac{5R}{2}$ therefore γ for this gas is:

(a) $\frac{35}{4}$ **(b)** $\frac{5}{7}$

(c) $\frac{4}{35}$ **(d)** $\frac{7}{5}$

81. For mono-atomic gas $C_V = \frac{3R}{2}$ therefore γ for this gas is:

(a) $\frac{15}{4}$ **(b)** $\frac{4}{15}$

(c) $\frac{5}{3}$ **(d)** $\frac{3}{5}$

82. A device which convert heat energy into mechanical energy is called:

(a) Heat engine **(b)** Pettier engine

(c) Carnot engine **(d)** All of above

83. An ideal heat engine has 100% efficiency only if its exhaust temperature is:

(a) Less than input temperature **(b)** Greater than input temperature

(c) Equal to input temperature **(d)** OK

84. It is impossible for heat engine to convert all heat into useful work, the law called:

(a) Second law of thermodynamics **(b)** First law of thermodynamics

(c) Law of conservation of energy **(d)** None of these

85. The statement, it is impossible for a self-acting machine, to transfer heat from a lower to higher temperature refers to:

(a) First law of thermodynamics **(b)** Law of conservation of mass

(c) Second law of thermodynamics **(d)** None of these

86. When the temperatures of source and sink of a heat engine become equal, the entropy change will be:

(a) Maximum **(b)** Minimum

(c) Zero **(d)** None of these

87. The efficiency of heat engine whose lower temperature is 17°C and the high temperature of 200°C is:

(a) 35% **(b)** 80%

(c) 90% **(d)** 25%

88. The formula for the efficiency of heat engine is:

(a) $\eta = \left(1 - \frac{Q_1}{Q_2}\right) \times 100\%$ **(b)** $\eta = \left(\frac{1 - Q_1}{Q_2}\right) \times 100\%$

(c) $h = \left(\frac{Q_2}{Q_1} - 1\right) \times 100\%$ **(d)** $\eta = \left(1 - \frac{Q_2}{Q_1}\right) \times 100\%$

89. An engine which convert heat energy into useful work upto 35% to 40% is:

(a) Petrol engine **(b)** Heat engine

(c) Deisel engine **(d)** Carnot engine

90. An engine which gives maximum efficiency is called:

(a) Carnot engine **(b)** Heat engine

(c) Petrol engine **(d)** All of above

91. The efficiency of carnot engine working between lower temperature T_L and higher temperature T_H is:

(a) $\eta = \left(1 - \frac{T_H}{T_L}\right) \times 100\%$ **(b)** $\eta = \left(1 - \frac{T_L}{T_H}\right) \times 100\%$

(c) $\eta = \left(\frac{T_H}{T_L} - 1\right) \times 100\%$ **(d)** $\eta = \left(\frac{T_L}{T_H} - 1\right) \times 100\%$

92. In carnot engine at the end of the cyclic path, the temperature of working substance is:

(a) Zero **(b)** Less than intital temperature

(c) Greater than initial temperature **(d)** Equal to initial temperature

93. If the temperature of the source increases, then the efficiency of carnot engine is:

(a) Remains constant **(b)** Increases

(c) Decrease **(d)** None of these

94. The efficiency of carnot engine depend upon:

(a) Sink temperature **(b)** Source temperature

(c) Both source and sink **(d)** The working substance

95. Carnot's cycle is an example of:

(a) Irreversible process **(b)** Reversible process

(c) Both (a) and (b) **(d)** None of these

96. Entropy is the measure of:

(a) Disorder of the system **(b)** Order of the system

(c) Internal energy **(d)** Potential energy of the system

97. The change in entropy of the system is given mathematical form:

(a) $\Delta S = -\frac{\Delta Q}{T}$ **(b)** $\Delta S = \frac{T}{\Delta Q}$

(c) $\Delta S = \Delta Q \times T$ **(d)** $\Delta Q = \frac{\Delta S}{T}$

98. Entropy of the universe is increasing due to:

(a) Use of energy into work **(b)** Depletion of ozone

(c) Power generation process **(d)** All of above

99. The concept of entropy was introduced by the scientist:

(a) R Clausius **(b)** Newton

(c) Kelvin **(d)** Carnot Sadi

100. No entropy change is associated with:

(a) Isobaric process **(b)** Isochoric process

(c) Isothermal process **(d)** Adiabatic process

101. The petrol engine is based on the principle of:

(a) Kelvin cycle **(b)** Carnot cycle

(c) Clausius cycle **(d)** Cyclic process

102. Four stroke petrol engine has the following process:

(a) 1 **(b)** 4

(c) 2 **(d)** 3

103. The number of spark plugs needed in the diesel engine is:

(a) 2 **(b)** 3

(c) 0 **(d)** 4

104. The temperature scale which is independent of the nature of the substance used in the thermometer is called:

(a) Absolute or Kelvin scale **(b)** Fahrenheit scale

(c) Centigrade scale **(d)** Thermodynamics scale

105. The relation between centigrade scale and Fahrenheit scale of temperature is:

(a) $\frac{C}{5}=\frac{F-32}{9}$ **(b)** $\frac{C}{9}=\frac{F-32}{5}$

(c) $\frac{C}{5}=\frac{F+32}{9}$ **(d)** $\frac{C}{9}=\frac{F+32}{5}$

106. The centigrade and Fahrenheit scales will have the same reading when the temperature is:

(a) 70° **(b)** –80°

(c) –40° **(d)** 120°

107. The Fahrenheit and Kelvin scale will have the same reading when temperature is:

(a) 370° **(b)** 574.25°

(c) 414.5° **(d)** 388°

108 Mercury thermometer was constructed by:

(a) Rutherford **(b)** Ampere

(c) Lord Kelvin **(d)** Einstien

109. Fahrenheit scale was originally used in:

(a) Meteorology **(b)** Clinical thermometer

(c) Clinical thermometer and meteorology **(d)** None of these

110. Mercury is used as a thermometric substance because:

(a) It does not stick to glass **(b)** Its specific heat is low

(c) Its expansion is uniform **(d)** All of above

111. A gas which strictly obeys the gas laws under all conditions of temperature and pressure is called:

(a) Real gas **(b)** Ideal gas

(c) Inert gas **(d)** None of these

112. Real gases strictly obey gas laws at:

(a) Low pressure and high temperature **(b)** High pressure and low temperature

(c) High pressure and high temperature **(d)** None of these

113. If the volume of a given mass of a gas is doubled at constant temperature then the density of gas becomes:

(a) Remains constant **(b)** Half

(c) Double **(d)** None of these

114. The temperature scale approved in SI units:

(a) Celsius scale **(b)** Fahrenheit scale

(c) Kelvin scale **(d)** None of these

115. Which of the following does not have the same units:

(a) Work **(b)** Heat

(c) Kinetic energy **(d)** Power

116. The motion of molecules in gases:

(a) Random **(b)** Orderly

(c) Circular **(d)** All of these

117. For an ideal gas, the molecules have:

(a) K.E only **(b)** P.E only

(c) Both K.E and P.E **(d)** None of these

118. At constant temperature, if the density of the gas is increased, its pressure will:

(a) Increase **(b)** Decrease

(c) Remains constant **(d)** None of these

119. Truth of kinetic theory is confirmed by:

(a) Brownian motion **(b)** Diffusion of gases

(c) Both (a) and (b) **(d)** None of these

120. When a gas is compressed:

(a) Its temperature decreases **(b)** Its internal energy decreases

(c) Its temperature increases **(d)** None of these

121. If an amount of heat Q enters, the system:

(a) Work is done **(b)** Increase in internal energy

(c) Both (a) and (b) **(d)** None of these

122. The equation $W = -\Delta U$ represents:

(a) Isothermal process **(b)** Adiabatic process

(c) Isobaric process **(d)** Isochoric process

123. Consider volume in a cylinder is 4 c.c. If the piston is kept fixed and gas is heated from 10°C to 15°C then the work done is:

(a) 4.3 J **(b)** 20 J

(c) 15 J **(d)** Zero

124. If C_v is the molar heat capacity at constant volume and ΔT is the change in temperature then $C_v \Delta T$ gives:

(a) Area **(b)** Energy

(c) Volume **(d)** Density

125. When a gas is compressed isothermally, the product of its pressure and volume during the process is:

(a) Remains constant **(b)** Zero

(c) Proportional to energy **(d)** None of these

126. If the temperature difference between hot and cold body is greater than the heat engine is:

(a) Not efficient **(b)** Less efficient

(c) More efficient **(d)** None of these

127. As the working substances of a heat engine completes a cycle, there is no change in:

(a) Internal energy **(b)** Volume

(c) Pressure **(d)** All of these

128. What will be the efficiency of a carnot engine if it is operated between the temperatures 47°C and 127°C:

(a) 25% **(b)** 20%

(c) 50% **(d)** 10%

129. One degree of thermodynamic scale is equal to ———— of the temperature of triple point of water:

(a) $\frac{1}{273.16}$ th **(b)** $\frac{1}{273}$ th

(c) $\frac{1}{100}$ th **(d)** $\frac{1}{32}$ th

130. The unknown temperature T on thermodynamic scale in Kalvin is given by formula:

(a) $T = 273.16 \frac{Q}{Q_3}$ **(b)** $T = 32 \frac{Q}{Q_3}$

(c) $T = 100 \frac{Q}{Q_3}$ **(d)** $T = 273 \frac{Q}{Q_3}$

131. One degree of thermodynamics scale of temperature is called:

(a) Celsius **(b)** Fahrenheit

(c) Kelvin **(d)** Meter

132. At constant pressure, the graph between V and T is:

(a) Hyperbola **(b)** Parabola

(c) Straight line **(d)** Ellipse

133. In reversible process, the entropy:

(a) Remains constant **(b)** Increases

(c) Decreases **(d)** Both (a) and (b)

134. Temperature of –273°C on Kelvin scale is:

(a) +273 K **(b)** +373 K

(c) –273 K **(d)** 0 K

135. In the isothermal process, one of the following is constant:

(a) Pressure **(b)** Volume

(c) Temperature **(d)** Heat energy

136. If a given mass of gas occupies a volume of 100 cc at one atmospheric pressure and temperature of 100°C (373.15 K), what will be its volume at 4 atmospheric pressure, the temperature being the same?

(a) 25 cc **(b)** 100 cc

(c) 104 cc **(d)** 400 cc

137. 'P' is the pressure and 'd' is the density of gas at constant temperature, then:

(a) $P \propto \frac{1}{d}$ **(b)** $P \propto \frac{1}{d^2}$

(c) $P \propto d$ **(d)** $P \propto d^2$

138. Some gas at 300 K is enclosed in a container. Now the container is placed on a fast moving train. While the train is in motion, the temperature of the gas?

(a) Rises above 300°K **(b)** Falls below 300°K

(c) Remains unchanged **(d)** Becomes unsteady

139. Triple point of water is:

(a) 273.16°C **(b)** 273.16 K

(c) 273.16°F **(d)** 373.16 K

140. A diesel locomotive has an efficiency of nearly:

(a) 28% **(b)** 38%

(c) 48% **(d)** 58%

141. A steel tape gives correct measurement at 20°C. The length of a piece of wood is being measured with steel tape at 0°C. The reading is 25 cm on this tape. The real length must be:

(a) 25 cm **(b)** Less than 25 cm

(c) More than 25 cm **(d)** 5 cm

142. A gas performs the most work when it expands:

(a) Isothermally **(b)** Adiabatically

(c) Isoberically **(d)** At a non-uniform rate

143. The following expression represent:

$$\Delta U = -W$$

(a) Isothermal expansion **(b)** Adiabatic compression

(c) Isobaric process **(d)** None

144. In which stroke of petrol engine fuel is ignited?

(a) First **(b)** Second

(c) Third **(d)** Fourth

145. Which of the following process is irreversible?

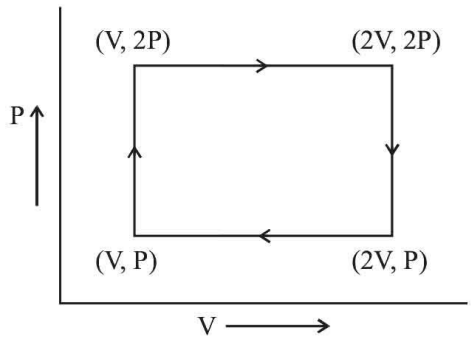
(a) Rapid liquefactions **(b)** Rapid compression of a gas

(c) Explosion **(d)** All

146. The work done during the cycle is:

(a) 1 PV **(b)** 2 PV

(c) 1/2 PV **(d)** Zero



147. The value of Boltzmann's constant is:

(a) 1.38×10^{-23} J/K **(b)** $1.38 \times 10^{+23}$ J/K

(c) 1.38×10^{-23} J/mole-K **(d)** 1.38×10^{-23} J/K mole-K

148. Fahrenheit and centigrade (Celsius) thermometers have the same reading at:

(a) −100°C **(b)** 60°

(c) 40°C **(d)** −40°C

149. If co-efficient of linear expansion of a solid body is α, its co-efficient of cubical expansion will be approximately:

(a) 2α **(b)** 3α

(c) 2.5α **(d)** 4α

150. A system does 600 J of work and at the same time has its internal energy increased by 320 J. How much heat has been supplied?

(a) 280 J **(b)** 920 J

(c) 600 J **(d)** 20 J

151. No entropy change takes place in:

(a) Isothermal process **(b)** Adiabatic process

(c) Isobaric process **(d)** Isochoric process

ANSWERS

1.	(a)	**2.**	(a)	**3.**	(a)	**4.**	(c)
5.	(b)	**6.**	(d)	**7.**	(c)	**8.**	(a)
9.	(d)	**10.**	(c)	**11.**	(a)	**12.**	(d)
13.	(c)	**14.**	(b)	**15.**	(a)	**16.**	(b)
17.	(a)	**18.**	(b)	**19.**	(d)	**20.**	(d)
21.	(b)	**22.**	(a)	**23.**	(c)	**24.**	(a)
25.	(d)	**26.**	(d)	**27.**	(a)	**28.**	(b)
29.	(c)	**30.**	(a)	**31.**	(c)	**32.**	(a)
33.	(b)	**34.**	(c)	**35.**	(a)	**36.**	(b)
37.	(b)	**38.**	(b)	**39.**	(c)	**40.**	(b)
41.	(b)	**42.**	(a)	**43.**	(a)	**44.**	(a)
45.	(c)	**46.**	(b)	**47.**	(c)	**48.**	(a)
49.	(c)	**50.**	(d)	**51.**	(a)	**52.**	(b)
53.	(a)	**54.**	(c)	**55.**	(c)	**56.**	(b)
57.	(b)	**58.**	(d)	**59.**	(b)	**60.**	(a)
61.	(a)	**62.**	(c)	**63.**	(d)	**64.**	(a)
65.	(c)	**66.**	(a)	**67.**	(c)	**68.**	(a)
69.	(b)	**70.**	(c)	**71.**	(a)	**72.**	(a)
73.	(b)	**74.**	(d)	**75.**	(b)	**76.**	(b)
77.	(a)	**78.**	(d)	**79.**	(b)	**80.**	(d)
81.	(c)	**82.**	(a)	**83.**	(d)	**84.**	(a)
85.	(c)	**86.**	(a)	**87.**	(a)	**88.**	(d)
89.	(c)	**90.**	(a)	**91.**	(b)	**92.**	(a)
93.	(a)	**94.**	(c)	**95.**	(a)	**96.**	(b)
97.	(a)	**98.**	(a)	**99.**	(d)	**100.**	(d)
101.	(b)	**102.**	(b)	**103.**	(c)	**104.**	(d)
105.	(a)	**106.**	(c)	**107.**	(b)	**108.**	(c)
109.	(c)	**110.**	(d)	**111.**	(b)	**112.**	(a)
113.	(b)	**114.**	(c)	**115.**	(d)	**116.**	(a)
117.	(a)	**118.**	(a)	**119.**	(c)	**120.**	(c)
121.	(c)	**122.**	(b)	**123.**	(d)	**124.**	(b)
125.	(a)	**126.**	(c)	**127.**	(d)	**128.**	(b)
129.	(a)	**130.**	(a)	**131.**	(c)	**132.**	(c)
133.	(b)	**134.**	(d)	**135.**	(c)	**136.**	(a)
137.	(c)	**138.**	(c)	**139.**	(b)	**140.**	(b)
141.	(b)	**142.**	(c)	**143.**	(b)	**144.**	(c)
145.	(d)	**146.**	(a)	**147.**	(a)	**148.**	(d)
149.	(b)	**150.**	(b)	**151.**	(b)		