ZENITH TUTORIALS PHY 101 PDF 2

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1. _____refers to any measurable properties of a substance. Ans: Quantity

2. Measurement of quantities are specified by _____ Ans: Units

3. The units were established by international agreement in _____Ans: 1960

4. The main basic units are _____ _____and _____ Ans: Length, mass and time

5. The basic quantities are _____ Ans: LMTETAL i.e. length, mass, time, electric current, temperature, amount of substance, luminous intensity.

6. The units of the basic/fundamental quantities are _____Ans: M, Kg, S. A, K, Mol, Cd.

7. The units of derived quantities are called devived units because _____Ans: This is because they are combination of basic units

8. Not all vectors are derived quantities: True/False Ans: True

9. Not all fundamental quantities are vectors? True/False Ans: True

10. Newton is equivalent to _____ Ans: Kgm/s^2

11. _____is the unit of energy? Ans: J/Kgm^2s^{-2}

12. Convert the speed of a car moving at 30miles per hour into kilometer per hour (Km/hr) Ans: 48.27km.hr

13. Convert the speed of a car moving at 30miles per hour into mm/sec Ans: 13408.3mm/sec

14. The result of scalar multiplication always results to _____Ans: Scalar

15. The dot product of two perpendicular vectors is _____ Ans: Zero (0)

16. The cross product of two parallel vectors is _____ Ans: (Zero)

17. The dot product of two perpendicular vectors is zero because _____ Ans: $Cos90^0 = 0$ (Zero)

18. If $\bar{A} = 2i + j + 3K \text{ and } B = 3i + 2j + 6k$ find the dot product? Ans: 26

19. If $\bar{A} = 2i + j + 3K \text{ and } B = 3i + 2j + 6k$ find the angle between vectors A and B Ans: $\theta = 6.70^0$

20. If $A = 2i + j + 3k \text{ and } B = 3i + 2j + 6k$ Find the cross product of A and B Ans: $-3j + k$

21. If $A = 4i - 8j - 3k \text{ and } B = 6i - 3j - 4k$ what is AxB? Ans: $23i - 2j + 36k$

22. If $\frac{\bar{A}}{10N} \text{ and } \frac{\bar{B}}{5N}$ move in the same direction, then their resultant force is _____ Ans: $F_R = 10N + 5N = 15N$

23. If $\frac{\bar{A}}{10N} \text{ and } \frac{\bar{B}}{5N}$ move in opposite direction then their reusltant force is _____ Ans: $F_R = 10N - 5N = 5N$

24. If forces 3N and 4N are perpendicular to each other, the resultant force is _____
Ans: $R = \sqrt{4^2 + 3^2} = \sqrt{25} = 5N$

25.

Find the resultant vector and direction Ans: 27.3N, 38.5^0

MOTION ANALYSIS

1. A body exhibits motion when its position changes
   Ans: Continuously

2. _____deals with the description of motion
   Ans: KINEMATICS

3. _____deals with motion and its cause
   Ans: DYNAMICS

4. _____is the position of an object, relative to some reference point. Ans: Distance

5. _____is the distance covered in a specified direction. Ans: Displacement

6. _____involves only the initial and final position of an object. Ans: Displacement

7. If a man moves from (X) = 0m to 10m (from A to and then back to (X) = 0m. What is the   distance and the displacement of the bus? Ans: Distance = 20m, Displacement = 0m

8. If a bus moves from (X) = 5m to. (X) = 200m and then back to x=5m, what is the distance and the displacement of the bus? Ans: Distance = 390m, Displacement = 0m

9. If a player runs from his own post to the other team's post and return to his own post, the distance covered by the player is? Ans: $2\ x$

10. _____is a scalar quantity while _____is a vector quantity Ans: Distance is scalar while displacement is vector

11. If an object covers equal distances in equal time interval, the object is said to have _____ Ans: Uniform or constant speed

12. If the distances covered by an object are not equal, the object is said to have _____
    Ans: Average speed

13. _____is expressed as the total distance covered divided by the total take time
    Ans: Average speed

14. _____is defined as the distance travelled in unit time Ans: Speed

15. _____is defined as the rate of change of displacement with time. Ans: Velocity

16. _____is expressed as equal displacement in equal time Ans: Uniform velocity

17. _____is expressed as the total displacement over total time taken   Ans: Average velocity

18. _____is expressed as change in displacement when the change in time is very small? Ans: Instaneous velocity

19. In a car, what does the car measure Ans: Speed (by the instrument called speedometer)

20. Given that the displacement of a body is described by the equation $X = ct\ +\ Dt^2\ where\ C = 2m/s\ and\ D = 0.1m/s$ while X is in metre (m) and t is in seconds (s) what are the displacement between the time interval t= 2sec and t=5sec and the average velocity? Ans: 8.1m and 2.7mls

21. The motion of a talking drum is _____
    Ans: Oscillatory/vibratory

22. A car travels along a straight pole for 4.8km at 60km/hr at which point the car runs out of gas   and stop. The driver walks for the next 15min, for another 1.5km along the road to find a gas station? What is the driver's displacement from the beginning of the journey, the time interval taken for the journey and the average velocity for whole journey? Ans: 6.3km, 0.33hr,   19.09km

23. _____is the slope of any distance time graph?
    Ans: Speed

24. A line graph that denotes the distance covered in a given time is _____ Ans: Distance time graph

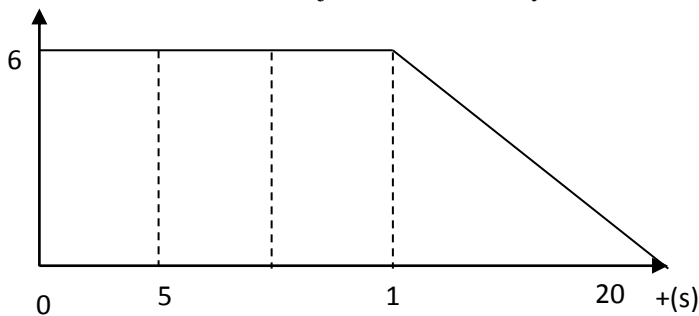25. _____ is the slope for velocity-time graph? Ans: Acceleration

26. The area under graph for velocity-time graph is _____ Ans: $\frac{Displacement}{2} = \frac{d}{2}$

27. The slope for acceleration-time graph is _____ Ans: Jerk

28. $\frac{Acceleration}{time}$ is equal to _____ Ans: Jerk

29. Area under graph for acceleration time-graph is _____ Ans: $\frac{Velocity}{2} = \frac{V}{2}$

30. The motion of an object is described by v(m/s)

Determine the total distance travelled by the object? Ans: 90m.

31. The simplest kind of accelerated motion is _____ Ans: Straight line motion with constant acceleration

32. _____ is the motion in which velocity changes at the same rate. Ans: Uniformly accelerated motion

33. _____ is constant for a uniformly accelerated body Ans: Acceleration due to gravity (g)

34. If the effect of the air can be neglected, all bodies/objects at a particular location fall with the same downward acceleration regardless of their size or weight. This the statement of who? Ans: Galileo

35. A stone is thrown up from the top of a platform with an initial velocity 19.8mls. If the top of the platform is taken to be ground level, calculate the time taken to reach the maximum height, maximum height reached by the stone, total time taken to reach back to the to top of the platform and velocity just before reaching the ground Ans: 2.02sec, 20.0m, 4.04sec and 19.8mls

36. A ball of mass 0.75kg is thrown vertically upward with an initial velocity 40mls. Find the velocity after 3sec, the maximum height attained and the time taken to reach the height? Ans: 10.6sec, 81.63ms^{-1} and 8.2sec

37. The maximum range occurs at _____ Ans: 45^0

38. Maximum range is given by the formula _____ Ans: $R_{max} = \frac{U^2}{g}$

39. The time taken for a projectile to reach the maximum height is given by _____ Ans: $\frac{Vsin\alpha}{g}$

40. If P is pressure of a gas, and V is its volume, what unit is the quantity PV measured Ans: Newton meter i.e. Nm

41. The path followed by a projectile is called _____ Ans: TRAJECTORY

42. At $\theta = 45^0$, Range is _____ Ans: Range $= \frac{V^2}{g}$ (i.e. maximum range)

43. The shape of the path followed by a projectile is _____ Ans: Parabolic shape

44. The time of flight for an object is 20sec and its horizontal displacement is 400m. the horizontal component of its velocity is _____ Ans: 20mls

45. Every body or object continues in its state of rest in a straight line unless it is acted upon by an external force. This is _____ Ans: 1st law of motion

46. The 1st law of motion is otherwise called____
Ans: INTERTIA

47. "Action and Reaction are equal but opposite" this is _____Ans: 3rd law of motion

48. When the same force (F) is applied to two bodies of masses M1 and M_2 and accelerantion $a_1$and a_2 respectively, then _____ Ans: $\frac{M_2}{M_1} = \frac{a_1}{a_2}$

49. ____is defined as the force which gives a mass of 1kg an acceleration of 1ms^{-2} Ans: Newton (N)

50. The interactions between two bodies always exist in pairs and are called_____ Ans: ACTION AND REACTION

51. _____is defined as the motion of a particle not subjected to forces Ans: Intertia frame of reference

52. The presence of an in balanced force _____an object and _____ the speed and direction
Ans: Accelerates the object and changes the speed and direction

53. For unbalanced forces, acceleration is not equal to zero: TRUE/FALSE Ans: True

54. For balanced forces, acceleration is _____
Ans: ZERO

55. For balanced forces, when an object is at rest, then velocity is _____ Ans: ZERO

56. For balanced forces, when the object stays in motion with same speed and direction, velocity is _____
Ans: Velocity is not equal to zero

57. The law that suggest that all forces are unbalanced is _____Ans: 2nd law of motion

58. The acceleration of an object depends upon _____and_____ Ans: Net force and the mass of the object

59. Acceleration of an object depends _____on the net force? Ans: directly

60. Acceleration of an object depends _____on the mass of the object Ans: Inversely

61. When forces are unbalanced, then _____ Ans: There is an acceleration

62. A force of 10N gives a mass M_1 an acceleration of 5m/s^2 and M_2 an acceleration of 20m/s^2. Find M_1 and M_2? Ans: M_1 = 2kg, M_2 = 0.5kg

63. Mass of 3kg and 5kg are connected by a cord and are suspended over a frictionless pulley. What is their acceleration when released Ans: 2.45m/s^2

64. _____is the motion of an object with regard to other moving object? Ans: Relative motion

65. Relative motion occurs with _____, _____ and _____ Ans: Relative speed, acceleration and velocity

66. Two cars A&B that are approaching and intersect along two perpendicular roads have the following velocity. Velocity of car A relative to the ground 82m/s eastward. Velocity of car B relative to the ground is 52m/s northward. Find the magnitude and direction of car A as measured by a passenger in car B Ans: 97.1m/s and 32.38^0

67. When a particle moves along a curved path, its direction of the velocity _____Ans: Changes

68. When a particle moves along a curved part, its direction of the speed is _____ Ans: Constant

69. _____is a motion in which particle move in a circle with a constant "speed and varying velocity Ans: Uniform circular motion

70. In circular motion, the acceleration is always _____? Ans: Directed radially inwards.

71. If a driver travels at a constant speed in the circle of radius 5.0m and makes one complete circle in

4sec. find the acceleration of the motion? Ans: 12.34ms^{-1}

72. Find the acceleration of the earth as its moved in its orbit around the sum for a period of a year (r =1.496x10^{11}m) Ans:

73. A pendulum bob of mass 2kg is attached to a string 2m long and made to revolve in a horizontal circle of radius 0.8m. Find the tension (T) in the string? Ans: 21N

74. _____ is the force required to keep an object of mass M moving in a circular path?
Ans: Centripetal force

75. _____is the force that acts outward from the centre of a circle? Ans: Centrifugal force

76. _____is a reaction to centripetal force
Ans: Centrifugal force

77. A ball of mass 2kg moves round a circle of radius 5m with a constant speed of 10m/s. calculate the force towards; the centre? Ans: 40N

78. A mass of 25kg is attached to a rope of radius 5m at a little push, the object revolves uniformly in a circle. If the object completes 5 revolutions every minute. Find the force exerted? Ans: 34.27N

79. _____ is a motion that is represented in terms of sines and cosines? Ans: Harmonic motion

80. _____is the motion of a particle whose acceleration is proportional to its distance from a fixed point and its always directed towards that point?
Ans: SIMPLE HARMONIC MOTION

81. Examples of simple harmonic motion are _____, _____ and _____ Ans: Swing. Pendulum string of guitar and Loaded test tube

82. The maximum displacement from the equilibrium position in _____Ans: Amplitude

83. The number of cycle/oscillation completed in a given time is _____Ans: Frequency

84. The time taken to complete one oscillation is _____Ans: Period

85. Energy in simple Harmonic motion is due to _____and_____ Ans: Potential and Kinetic energies

86. The energy stored in the particle of a system is _____Ans: Potential energy

87. Total energy in a system is given by _____Ans: E_T= ½ KA^2

88. The energy of a particle of a system exhibiting simple harmonic motion is proportional to the square of _____of the motion Ans: Amplitude

89. The equation of motion for a body undergoing simple harmonic motion can be written as $x = $ A sin (wt + θ). The velocity V of the body from the above equation can be written as _____
Ans: $V = w\sqrt{A^2 - x^2}$

90. The bob of a simple pendulum of length 10m oscillates with a small amplitude. Calculate the period Ans: 6.28sec

91. A particle moves about the same point several times at regular time intervals. The motion of the particle is _____ Ans: Circular

92. An object is oscillating in simple harmonic motion with amplitude of 15cm and a period of 2sec. Find the velocity and acceleration when its displacement from the equilibrium is x =0 Ans: 0.4713m/s and Om/s^2

93. The S.I unit of work is _____Ans: J or Nm

94. When work is positive, then _____
Ans: $0 < θ < 90^0$

95. When work is negative, then _____

Ans: $90^0 < \theta < 180^0$

96. When work is Zero, then _____

Ans: $\theta = 90^0$

97. A girls carrying load from one point to another on a straight line. The angle made by the girl is 90^0, what is the work done? Ans: Zero

98. How much work is done if a force of 12N moves an object a distance of 5m Ans: 60Nm or 60J

99. If you use a 40N force to lift a bag and do 20J of work, how far did you do the work? Ans: 0.5m

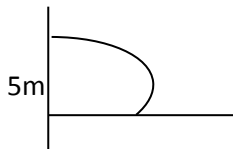100. Express 10kJ in Joule? Ans: 10,000J

101. Express 35mJ in Joule? Ans: 35×10^{-3}J

102. Express 0.5mJ in Joule? Ans: 0.5×10^{-3}J

103. If the stone in the below diagram, is dropped, what is the K.E when it has fallen half way of the ground? Ans: 80J

4m

104. The stone of mass 4kg on the slide below slides down along a slope, what is its speed when it reaches the ground? Ans: 10m/s

5m

105. The unit of power is Watt or J/S

106. The product of force (F) and velocity (V) is _____Ans: Power

107. A proton is accelerating at 3.6×10^{15}m/s^2 through a distance of 2.5cm. If the initial velocity is 2.4×10^7 ms-1. Find the change in Kinetic energy at the end of the distance? (M = 1.67×10^{-27}kg

Ans: 2.1×10^{-13}N

108. A body of mass 2kg has initial velocity of 8ms in the $+x$ direction as it passes the origin of the coordinates. It is subejcted to a rearding force such that $Fx = -0.5$. what will be the $x-$ coordinate when it stops? Ans: 128m

109. A 10g bullet moving at 70ms^{-1} penetrates a of wood 5cm before stopping. The kinetic energy and the average stopping force are? Ans: 24.5J and 490N

110. An airplane engine develops a total thrust of 10,000N when it is flying at 250ms^{-1}. Calculate the power developed by the engine in horse power?

Ans: 3351.2hp

111. A body whose mass is 40kg finds that he can run up a flight of 50steps each 15cm high, in 5sconds. How much power is required? (g =10ms^1)

Ans: 600N

112. A tractor, can exert a force of 5×10^5 N while moving at a constant speed of 10m/s determine its power in hose power? Ans: 6702hp

113. _____is otherwise called turning effect" Ans: Moment

114. Find the tonque produced by the 300N force applied at an angle of 60^0 to the door of the figure shown below


60^0

2m
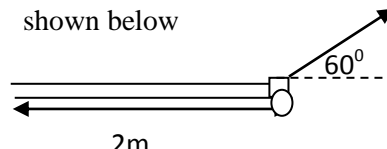
Ans: 520Nm

115. If the force tends to produce a counter clockwise acceleration, then moment is _____

Ans: positive

116. If the force tends to produce a clockwise acceleration, then moment is _____

Ans: Negative

118. A rigid rod AB, length 2.8m with negligible mass is acted upon by a force of 20N at end A. If the rod is pivoted 1.2m from end A, find the value of the force at B, such that the rod is in equilibrium and the reaction at the pivot? Ans: 15N and 35N

119. The point where the mass of the body can be thought to be concentrated is _____Ans: Centre of mass (M)

120. The point through which the total gravitation attraction can be considered to act on the body is _____ Ans: Centre of gravity (G)

121. The pressure exerted on fluid at rest is _____ Ans: applied in all directions

122. What is the difference in blood pressure between the top of the heart and the bottom of the heart of 1.5m tall man standing uprightly? Take the density of the blood to be 1.038 x 10^4kg/m^3 Ans: 159936Nm^{-2}

123. IF the liquid in a manometer is mercury of density 1.64×10^4 kgm^{-3} and the height (h) is measured to be 21.13m as shown below. Calculate the corresponding absolute pressure?
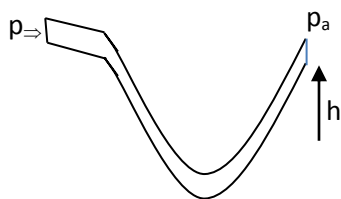
Ans: 3497313.6Nm^{-2}

124. The ability of an object to float when it is placed in a fluid is _____Ans: Bouyancy

125. _____is the principle that states that upthrust is equal to weight of the fluid displaced by the object? Ans: Archimedes' principle

126. Determine the weight of the iron cube of volume 600cm^3, if it totally immersed in water of density 5g/cm^3 Ans: 2.94 x 10^4N

127. Heat can be transferred by there processes except (a) Radiation (b) Conduction (c) Evaporation (d) Convection Ans: Evaporation (C)

128. The amount of heat which a substance absorbs or releases during a phase change without change in temperature is called _____ Ans: Latent heat

129. An ideal gas at 27^{0}C and pressure of 1.0X10^5 is compressed at constant temperature until its volume in halved. Calculate the final press of the gas? Ans: 2.0x10^5 (i.e. pressure is doubled)

130. If P is the pressure of a gas and V volume, in what unit could the quantity PV be measured? Ans: Newton-metre (i.e. Nm)

131. _____is the ratio of change in length over original length multiplied by temperature Ans: Linear exansivity (α)

132. What will be the decrease in length of a rod at 20^{0}C. if it is 100.06cm long at 70^{0}C? Ans: 0.06cm

133. A system absorbs 1,500 J of heat energy from each surroundings. Calculate the change in internal energy body of the system when the system performs 2,200J of work on the surroundings Ans: -700J

134. A system absorbs 1,500J of heat energy from the surroundings. Calculate the change in internal energy of a system when the surrounding performs 2200J of work on the system? Ans: 3700J

135. An ideal gas performs 600J of work with the release of heat energy of 502J. find the value of work, ΔQ and ΔU and what happens to the temperature of the system Ans: 600J, -502J, -1102J

136. An ideal gas is heated at constant volume its pressure doubles when _____Ans: The mean square speed of the molecules doubles.

137. The liquid that is most viscous is _____ Ans: Engine oil.

138. The specific heat capacity of gas at constant pressure is greater than that at constant volume because_____

139. Ans: This is because at constant pressure, the molecules have to travel lesser distance between collision

140. In which of the following is the expansion of solid a disadvantage Ans: The balance wheel of a watch

141. Which property can be used to measure temperature? Ans: Change in colour

142. The clinical thermometer differs from other liquid in glass thermometer because Ans: It has a constriction

143. The temperature at which water vapour present in air is just sufficient to saturate it is _____ Ans: Dew point

144. Which is the correct statement of Boyle's law? Ans: V $\alpha \frac{1}{P}$

145. The magnitude of the acceleration of moving object is equal to the _____Ans: Gradient of a velocity time graph

146. Which is used to measure the inner diameter of a test-tube? Ans: A pair of calipers.

147. The set of scalar quantities are _____Ans: Length, mass and time

148. A body of mass 5kg is acted upon by a horizontal force of 20N. Calculate the acceleration produced if the first force is opposed by a second force of 5N Ans: 3.0m/s^2

149. Calculate the force acting on a body of mass 5kg that will produce a velocity of 10ms^{-1} in a time of 5sec Ans: 10N

150. Calculate the gravitational attraction of two cars 5m apart if the masses of the cars are; 1000kg and 1200kg Ans: 3.2 x 10^{-6}N

151. Calculate the force between the sun and Jupiter. Assume that the mass of the sun equals 2 x 10^{30}kg, the mass of Jupiter equals 1.89 x 10^{27}kg, and the radius of Jupiter's orbit equals 7.73 x 10^{11}m Ans: 4.22 x 10^{23} N

152. The gravitational force of attraction acting between any two bodies of the masses M_1 and M_2 is proportional to be product to the masses and inversely proportional to the square of the distance 'r' between them. This was the statement of? Ans: Newton's Law of Universal Gravitation

153. _____is the resistive force which acts at the surface of separation of two bodies in contact and tends to oppose the motion of one over another Ans: Friction

154. _____is the type of friction when the body is just about to move over another surface. Ans: Static or limiting friction

155. The angle which the resultant (total reaction) makes with the normal, reaction, if the normal reaction, N and the frictional force Fr are compounded into a single force is ____ Ans: Angle of friction

156. The hockey puck is given an initial speed of 20m/s on a frozen pond. The puck remains on the ice and slides 120m before coming to rest, determine the coefficient of kinetic friction between puck and ice? Ans: 0.170

157. A car of mass 1.40 x 10^{3}kg being towed has a net forward force of 4.50 x 10^{3}N applied to it, the car

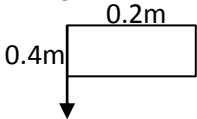starts from rest and travels down horizontal highway. Find the speed of the car after it has travelled 100m Ans: 25.4ms^{-1}

158. A constant horizontal force of 50N acts on body that is resting on a smooth, friction less horizontal plane. The body is observed to go from rest to V=5ms^{-1} in 10sec. what is the mass of the body? Ans: 100kg

159. _____is defined as the product of the force and time during which it acts? Ans: Impulse

160. A body of mass 5kg moving with velocity of 10ms^{-1} is acted upon by a force of 25N for 0.2sec. Determine the final velocity of the body? Ans: 11ms^{-1}

161. A gun of mass 10kg released a bullet of mass 20g at a speed of 100ms^{-1}. Find the gun's speed of recoil? Ans: 0.2ms^{-1}

162. Adam's find himself in the centre of a shoot-out between the army and armed robbers. A 2.0g bullet moving at 200ms^{-1} strikes him and lodges in his shoulder. If the bullet undergoes uniform retardation and stops after penetrating a distance of 10cm in his shoulder. Determine the in pulse in his shoulder and the average force experienced by him? Ans: 0.4Ns and 400N

163. _____ is defined as the fractional increase in length? Ans: Strain

164. If the hot air in a ballom has a density equal to three-fourth of the density of air, what minimum ballon volume is required to lift a total load of 500kg? The density of air at 0^{0}C and atmospheric pressure is 1.29kg/m^3. Ans: 1550.38m^3

165. The angle between the solid surface and the tangent plane to the liquid surface measured through the liquid is _____Ans: Angle of contact

166. _____can be defined as the frctional force per unit area of liquid when it is in a region of unit velocity gradient Ans: Coefficient of viscosity

167. The unit of coefficient of viscosity is _____Ans: Nsm^{-2}

168. A steel wire 10m long and with a cross-sectional area of 0.01cm^2 is hung from a support and a mass of 5kg is hung from its end. Calculate the new length of the wire? The young modulus for steel = 210GPa Ans: 10. 0024m

169. Find the increase in pressure that is required to decrease the volume 1m^3 of water by 10^{-4}m^3, if the bulk modulus of water is 2 x 10^{9}Nm^{-2}

170. A glass fibre of diameter 12μm is found to breaking under a load of 12g. Determine the breaking stress of the fibre? Ans: 1.04 x 10^{9}Nm^{-2}

171. A small oil drop falls with a terminal velocity 4 x 10^{-4} ms^{-1} through air. Calculate the radius of the drop. Viscosity of air = 1.8 x 10^{-5} Nsm^{-2}. Density of oil = 900kgm^{-3}, g = 10ms^{-2}, neglect density of air? Ans: 1.9 x 10^{-6}m

172. Calculate the energy stored in a string of length 20cm which extends to 24cm when it supports a weight of 50N Ans: 1J

173. A constant volume gas thermometer indicates a pressure of 250Hg at the ice point and 750Hg at the steam point, what temperature will it read on the thermometer when it reads a pressure of 450Hg? Ans: 40^{0}C or 313k

174. A tyre is pumped to a pressure of 30Nm^{-2} at 27^{0}C. When the tyre heats up to 54^{0}C, find the new pressure? Assuming no change in volume? Ans: 32.7Nm^{-2}

175. The diameter of a steel plug is 2.5cm at 25^{0}C. If the linear expansivity of steel is 1.2x10^{-5}K^{-1}, calculate the

temperature at which the plug will fit exactly into a hole of constant diameter 2.499cm? Ans: 8.3^0C.

176. _____is a process that occurs at constant pressure? Ans: Isobaric or Isopiestic process

177. _____is a process that occurs at constant volume? Ans: Isochoric/isovolumic process

178. _____is a process that occurs at constant temperature? Ans: Isothermal process

179. _____is a process that occurs without any transfer of heat Ans: Radiation process/Adiabatic process

180. Two rules of an ideal gas are compressed slowly and isothermally from a volume $0.4m^3$ to $0.1m^3$ at a temperature of 27^0C. How much work is done? [R=8.3] Ans: -6918J

181. A stone is thrown from P and follows a parabolic path. The highest point reached is T. The vertical component of acceleration of the stone is _____ Ans: The same at P and T

182. Four identical railway trucks, each of mass m, and coupled together and rest on a smooth horizontal truck. A fifth truck of mass 2m and moving at 5ms^{-1} collides and couples with the stationary trucks. After impact, the speed of the truck is V, where V is equal to Ans: $5/3\, ms^{-2}$

183. The following are quantities associated with a body performing S.H.M? Ans: The accelerating force acting on the body and the acceleration of the body

184. A bead, X resting on a smooth horizontal surface is connected to two identical spring and is made to oscillate to and for along the line of springs. When the bead passes through the central position, its energy is _____Ans: All kinetic energy.

185. Which of the following is a vector quantity (a) Speed (b) Distance (c) Energy (d) Momentum (d) Time Ans: Momentum (D)

186. If a constant force of 16N acts on a body of 4kg for 2sec. What change in the velocity would be produced on the body' Ans: 8.0ms^1

187. Find the magnitude of the resultant of two vectors of magnitude 5N and 12N respectively inclined at 90^0 to each other? Ans: 13N

188. Which of the following has the same unit as a force? (a) Power (b) Work (c) Force (d) Impulse € Momentum Ans: Force (c)

189. Which of the following will reduce the frequency of oscillation of a simple pendulum? Ans: Decreasing the length of the string

190. A body of mas 10kg falls from a height of 5m above the ground. What is the kinetic energy of the body just before it strikes the ground? Ans: 500J

191. An elastic string of length X is classifiably stretched through a length e' by a force F, the area of the cross-section of the string is A, and it young modules is E. which of the following expression in correct? Ans: $F = \frac{EAe}{X}$

192. Which of the following is of 1st Newton's law of motion Ans: INERTIAL

193. Which of the following instrument, can be used to measure the internal diameter of a test-tube? Ans: A pair of calipers

194. If an object moves with a constant speed round a circle, it has an acceleration that is ____Ans: Constant in magnitude and varying in direction

195. A ball is thrown vertically upwards from top of a tower with an initial velocity of 20ms^{-1}, if the ball took

a total of 6sec to reach the ground, what is the height of the tower? Ans: 60m

196. What is the period of a simple pendulum which makes 60 oscillations in one minute? Ans: 1.0sec

197. A spring of force constant 500Nm^{-1} is acted upon by a constant force of 50N. Calculate the potential energy stored in the spring? Ans: 2.50J.

198. Two forces each of 6N acts on the opposite sides of a rectangle plate as shown in the diagram. What is the magnitude of the couple acting on the plate

 Ans: 1.2Nm.

199. The slope of a straight line displacement graph indicates the _____Ans: Uniform velocity

200. A man exerts the greatest pressure on the floor of a room if he_____ Ans: Stands on the toes of one foot

201. The motion of a body is simple harmonic if the _____Ans: Acceleration is always directed to a fixed point and proportional to its distance from the fixed point

202. _____best describes orthogonality of vectors? Ans: 90^0

203. A ball of mass 0.4kg moving at 10ms^{-1} collides with another ball of equal mass at rest. Calculate their common velocity if the two balls move off together after the impact? Ans: 5.0ms^{-1}

204. A force of 20N acts on a body of mass 4kg in a medium where resistance is 2.0Nkg^{-1}. Calculate the acceleration of the body? Ans: 3.0ms^{-2}

205. In which of the following is mechanical work being done? Ans: A girl chewing a piece of chewing gum

206. Which of the following is not an S.I basic unit? (a) Metre (b) Kilogram (c) Newton (d) Second (e) Compere Ans: Newton

207. The thickness of the central portion of a thin converging lens can be determined most accurately by _____ Ans: A micrometer screw guage

208. Which of the following is a displacement Ans: 10metre south

209. A body starts from rest and accelerates uniformly at a rate of 5m/s^2. Calculate its velocity after moving 90m? Ans. 30m/s

210. An orange falling vertically downwards falls with Ans: constant acceleration

211. When a body is moving with a constant force Ans: Its acceleration in constant

212. Two forces 10N and 6N act in opposite directions on a body of mass 20kg. calculate the acceleration of the body? Ans: $\frac{1}{5} m/s^2$

213. A train traveling at 30m/s overcomes a friction resistance, of 100N while moving, what is the power of the engine? $\left[1hp = \frac{3}{4} kw\right]$ Ans: 4.0h.p

214. The coefficient of friction between a perfectly smooth body and a very rough body is ___Ans: Zero

215. If U is upthrust and V is viscous force, when terminal speed is reached, by a falling body, we have _____Ans: $mg - v - u = 0$

216. If P is the momentum of an object of mass m, then the expression p^2/m has the dimension of _____Ans: Energy

217. A locomotive develops a power of 5x10^{5}w, if the total frictional force is 2x10^4 N, the maximum speed in ms^{-1} is _____Ans: 25m/s.

218. A car turns a corner on a slippery road at a constant speed of 10ms^{-1}. If the coefficient of friction is 0.5, the minimum radius of the arc in 'm' in which the car turns is _____ Ans: 20m

219. Which of the following sequences describes the operation of internal combustion energy Ans: Induction, compression, power and exhaust. (ICPE)

220. Sensible heat and latent heat differ in their sensitivity to _____Ans: Temperature changes

221. A thermometer with an arbitrary scale, S, of equal division registers -40^{0}S at the ice point and 80^{0}S at the steam point. What is the thermometer reading when it registers 50^{0}S Ans: 75^{0}C

222. A copper rod is 3m long at a certain temperature calculate its length for a temperature rise of 100k if the expansivity of copper is $17\ X\ 10^{-6}K^{-1}$ Ans: 3.0051m

223. A cube of volume V, made of a metal of linear expansivity is warmed through a temperature of t. The increase in the volume of the cube is? Ans: $3\alpha vt$

224. How long does it take a 800-W heater to raise the temperature of 2kg of water from 20^{0}C to 60^{0}C (specific heat capacity of water = 4200JK^{-1}K^{-1}) Ans: 420sec.

225. The absolute temperature of a perfect gas is proportional to the average _____Ans: Kinetic energy of the molecules

226. A room is heated by means of a charcoal fire. A man in the room standing away from the friction is warmed by _____Ans: Radiation

227. Which of the following instruments may be used to measure relative humidity? Ans: Hygrometer

228. The design of the thermostat of an electric iron is based on the _____Ans: expansion of metals when heated.

229. Which of the following is the correct statement of Boyle's law? Ans: The volume of a fixed mass of gas is inversely proportional to its pressure at constant temp. C i.e. $V\alpha\frac{1}{p}$

230. The vaccum in the thermos flask prevents heat loss by ____Ans: Conduction and convection

231. One a day when the humidity of the air is very high, evaporation from a water pond will _____ Ans: Be slow

232. The volume of a gas is 76cm^3 at 27^{0}C and 800mHg pressure, what is its volume at STP? Ans: 72.8cm^3.

233. Which of the following colour of surface will radiate heat energy best? Ans: Black

234. The normal body temperature of a human being is _____Ans: 36.9^{0}C

235. The unit of linear expansivity is _____Ans:K^{-1}

236. The quantity of heat required to raise the temperature of a body by one degree celcius is defined as its ____Ans: Thermal capacity

237. How long will it take to heat 3kg of water from 28^{0}C to 88^{0}C in an electric kettle taking 6A from a 220V supply? (specific heat capacity of water is 4180J/kgk) Ans: $9\frac{1}{2}$ minutes

238. The heat required to change 1kg of ice at 0^{0}C to water at the same temperature is the ____Ans: Specific latent heat of fusion

239. One is able to smell food from a distance because _____ Ans: The molecules of air are in constant motion

240. Which of the following does not need a medium for heat transfer? Ans: Radiation

241. The silvered walls of a vaccum flask minimize loss of heat due to _____Ans: Radiation only

242. Palm oil from bottle flows out more easily after warming because _____Ans: Friction between the oil layers is reduced.

243. In a thermos flask, heat loss by radiation is minimized by the _____Ans: Silvered surfaces

244. Petrol quickly dries off when split on the floor because it _____Ans: Has a low boiling point

245. 0.8kJ of heat is supplied to a metal of mass 300g to raise its temperature from 30^0C to 7^0C. calculate the heat capacity of the metal? Ans: $3.2 \times 10^2 Jk^{-1}$

246. Physical properties shared by both radio waves and sound waves are Ans: Both can be reflected and diffracted

247. Sound waves can be diffracted because they are _____Ans: Longitudinal

248. Which of the following phenomenon can not be explained by the wave theory of light? Ans: Photo electric effect

249. Which of the following statements about sound waves is not correct? Ans: can be polarized

250. Which of the following groups of electro magnetic waves is in order of increasing frequency? Ans: radio waves, visible light, infrared radiation.

251. The change in the direction of a wave due to a change in velocity is _____Ans: Refraction

252. Which of the following waves is an electromagnetic waves? Ans: X-rays

253. A wave whose frequency is 0.4H travels 54m in 9seconds. The distance between adjacent crest is_____Ans: 15m

254. A hunter at 400m from a cliff fires a gun and hears an echo 2.4sec after, what is the speed of the sound? Ans: $340ms^{-1}$.

255. Which of the following has greatest penetrating power? Ans: Gamma ray

256. What part of camera corresponds to the iris? Ans: Diaphragm

257. Total internal reflection will not occur when light travels from _____ Ans: Water to glass

258. Primary colours are _____Ans: Blue, green and red

259. The portion of the spectrum which most produces the sensation of heat is the portion where we have _____Ans: Infrared.

260. Which of the following properties in not associated with sound waves? Ans: Polarization

261. The ability of a wave to spread around corners is _____Ans: Diffraction

262. The amplitude of a sound wave determines_____ Ans: Loudness.

263. Which of the following indicates a change of state of matter? Ans: Melting

264. The tendency of a body to remain at rest or to continue its state of uniform motion is called _____Ans: Inertia

265. Which of the following types of motion is most predominant in the molecules of a gas? Ans: Random

266. Which of the following equations represent the distance travelled by a body falling freely under gravity? Ans: $S = \frac{gt^2}{2}$

267. The pressure at a point in a liquid _____Ans: Is distributed equally in all directions

268. A centripetal force is one that _____Ans: Keeps an object moving in a circular track

269. Which of the following sources are renewable Ans: They are sun and wind.

270. The motion of a ball spinning on its axis is? Ans: Rotational

271. An orange at rest falls freely from a height of 10m to the ground. Calculate the time taken to reach the ground? Ans: 1.4sec

272. A body performing uniform circular motion has constant speed and varying velocity because Ans: The direction of motion changes

273. Potential and Kinetic energies are known collectively as _____Ans: Mechanical energy

274. The mode of heat transfer in which energy is carried from one end of a body to another without any material movement of the body _____ Ans: Conduction

275. A liquid begins to boil when its saturated vapour pressure is _____Ans: Equal to the atmospheric pressure

276. A fixed mass of gas of volume 313cm^3 at temperature of 40^{0}C is heated to 60^{0}C at a constant pressure. Calculate its new volume Ans: 333cm^3.

277. Which of the following symbols represent the S.I. unit of power Ans: W

278. What type of motion is generally performed by the molecules of a liquid in a container? Ans: Random

279. In simple harmonic motion, the angular velocity is inversely proportional to the ____Ans: Period

280. A car of mass 80kg moves in a circular track of radius 100m. if the velocity of the car is 20m/s, calculate the centripetal force acting on the car Ans: 320N

281. Which of the following dimensions is for Kinetic energy. Ans: ML^2T^{-2}.

282. A body is dropped from a height 50m above the ground neglecting air resistance, calculate the time taken by the body to reach the ground (g = 9.8ms^{-1}) Ans: 3.2sec

283. A music compact disc does 45 revolutions in one minute, calculate its angular velocity in red/sec Ans: 0.75$\overline{\lambda}$

284. A cold water tap supplies water at 20^{0}C and a hot water tap at 80^{0}C. To obtain warm water at 40^{0}C, the ratio of the mass of cold water to that of hot water to be mixed is _____Ans: 2:1

285. Two liquids X and Y having the same mass are supplied with the same quantity of heat. If the temperature rise in X is twice that of Y, the ratio of the specific heat capacity of X to that of Y is ____Ans: 1:2

286. A solid that changes directly into a gas upon heating is said to have undergone? Ans: Sublimation

287. Food cooks faster in a pressure cooker than in an ordinary cooking pot because_____ Ans: (i) The boiling point of water is greater than 100^{0}C in the pressure cooker (ii) The vapour pressure is higher in the pressure cooker.

288. On a hot and sunny day, the most comfortable colour of attire is ____Ans: White

289. The heat from the sum reaches the earth's surface by the process of ____Ans: Radiation

290. Which of the following phenomena can not be explained by the molecular theory of matter? Ans: Radiation

291. Two identical kettles X and Y are filled with water at 100^{0}C. The outside surface of X is painted black while that of Y is polished, then _____Ans: X cools faster because a blackened surface radiates heat faster than a polished surface

292. Cooking pots are usually made of metals because metals _____Ans: Are good conductors of heat

293. A house whose roof is painted white feels cooler on a hot day then one whose roof is painted black because _____Ans: White is a better reflector of heat than black.

294. A bottle of perfume is opened in one corner of a room and the scent is soon picked up in another part of the room. The perfume moves through the air in the room by _____Ans: Diffusion.

295. Determine the increase in pressure that is required to decrease the volume $1m^3$ of water to $2 \times 10^{-4} m^3$, if the bulk modulus of water is $2 \times 10^9 Nm^{-2}$. Ans: $2 \times 10^5 pa$

296. The Joule (J) as the unit of work is equivalent to _____Ans: Nm or $Kgms^{-2}$.

297. A steel wire of length 20m is stretched to 20.0/m by the application of a stretching force of 50N. what should be the stretching force so that its length may become 20.05m within its elastic limit? Ans: 250N

298. Elasticity can best be defined as _____Ans: the ability of an object to resist deformation under the action of an external force.

299. the speed of ocean waves is proportional to the acceleration due to gravity (g) wavelength (λ) and density (ρ) of the wave such that $c = Kg^x \lambda^y \rho^z$, where K is a dimension less constant. The correct equation for the speed of the ocean wave is given as _____ Ans: $C = K\sqrt{g\lambda}$

300. A force of 10N is applied to push a mass of 2kg along a straight horizontal level. What is the acceleration of the body? Ans: $5m/s^2$.

301. The temperature 45^0C is the same as (a) 25^0F (b) 57^0F (c) 81^0F (d) 113^0F
    The correct option is D

302. The lower fixed point corresponds to a length of 20mm on the stem of a thermometer while the upper fixed point corresponds to 160mm. the temperature corresponding to a length of 48 mm is (a) 20.0^0C (b) 30.0^0C (c) 41.7^0C (d) 50.0^0C
    The correct option is A

303. The ice and steam points on a thermometer corresponds to X and 80 mm respectively. A temperature of 60^0C corresponds to 52 mm on the thermometer. The value of X is
    (a) 4mm (b) 8mm (c) 10mm (d) 20mm
    The correct option is C

304. The two fixed points in a thermometer are 60 mm apart. When the thermometer reads 48 mm above the ice point, the temperature is (a) 80^0C (b) 72^0C (c) 60^0C (d) 48^0C **The correct option is A**

305. The ice and steam points on a temperature scale are 50mm and 190mm respectively. The reading on this scale when the temperature is 70^0C is (a) 98mm (b) 138mm (c) 140mm (d) 148mm
    The correct option is D

306. A thermometer with an arbitrary scale Y registers -50^0Y at the lower fixed point and +70^0Y at the supper fixed point. The Celsius temperature corresponding to 30^0Y is (a) 42.9^0C (b) 50.0^0C (c) 66.7^0C (d) 75.0^0C
    The correct option is C

307. The temperature of -93^0C corresponds to an absolute temperature of (a) 366K (b) 293K (c) 283K (d) 180K
    The correct option is D

308. A faulty mercury-in-glass thermometer has 1.5^0C and 103.0^0C as its ice and steam points respectively. When the true temperature is 40^0C the reading on the thermometer is (a) 42.7^0C (b) 42.1^0C (c) 40.6^0C (d) 39.1^0C **The correct option is B**

309. A platinum resistance thermometer has resistances of 5.25Ω and 9.75Ω at 0^0C and 100^0C respectively.

When the resistance is 9.25Ω, the temperature is (a) 63.6^{0}C (b) 66.7^{0}C (c) 75.0^{0}C (d) 84.6^{0}C

The correct option is B

310. A constant volume gas thermometer indicates a pressure of 250 mm Hg at the ice point and 750mm Hg at the steam point. The temperature when the thermometer indicates a pressure of 450 mm Hg is (a) 40K (b) 233K (c) 313K (d) 333K

The correct option is C

311. A thermocouple works on the principle of

(a) Variation of *emf* with temperature

(b) Variation of *volume* with temperature

(c) Variation of *resistance* with temperature

(d) Variation of *pressure* with temperature

The correct option is A

312. A wire of length 5 m is heated from a temperature of 10^{0}C to 60^{0}C. If it undergoes a change of length of 20mm, the linear expansivity of the wire is (a) 8x10^{-4}K^{-1} (b) 4 x 10^{-4}K^{-1} (c) 8 x 10^{-5} K^{-1} (d) 4 x 10^{-5}K^{-1} **The correct option is C**

313. A metal rod of length L is subjected to a temperature rise θ. If its final length is 1.05L, its linear expansivity is (a) $\frac{1.05}{\theta}$ (b) $\frac{1}{1.050}$ (c) $\frac{1}{20L}$ (d) $\frac{1}{200}$

The correct option is D

314. A telegraph wire of length 100.0 m at 30^{0}C has a linear expansivity of 2 x 10^{-5}K^{-1}. The length of the wire at a temperature of -10^{0}C is (a) 100.08m (b) 100.04m (c) 99.96m (d) 99.92m

The correct option is D

315. A steel bridge is 500 m in length. If the temperature varies from a day-time high of 30^{0}C to a night-time low of 5^{0}C, and the linear expansivity of steel is 1.2 x10^{-5}K^{-1}, the daily variation in the length of the bridge is (a) 0.15cm (b) 1.50cm (c) 15.00cm (d) 1,500cm
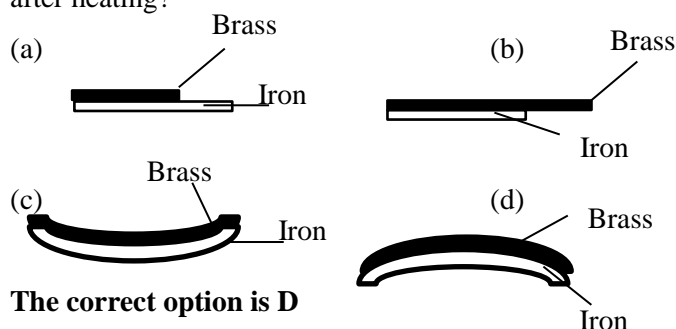
The correct option is C

316. The linear exapnsivity of aluminium is approximately twice that of steel. A piece of aluminium and a piece of steel undergo the same increase in length per degree rise in temperature. The ratio of the original length of aluminium to that of steel is (a) 0.05 (b) 1.0 (c) 1.5 (d) 2.0 **The correct option is A**

317. Steel bars each 2 m long, are used to construct a rail line. The linear expansivity of steel is 1.2 x 10-5K^{-1} and the maximum daily variation in temperature is 40^{0}C. The safety gap that must be left between successive bars is (a) 0.48mm (b) 0.96mm (c) 4.80mm (d) 9.60mm **The correct option is B**

318. The diameter of a steel plug is 2.5cm at 25^{0}C. If the linear expansivity of steel is 1.2 x 10^{-5}K^{-1}, the temperature at which the plug will fit exactly into a hole of constant diameter 2.499cm is (a) -30.3^{0}C (b) -8.3^{0}C (c) 8.3^{0}C (d) 33.3^{0}C **The correct option is B**

319. Which of the following diagrams correctly illustrates the shape of a bimetallic strip made of brass and iron after heating?

The correct option is D

320. A square plate of side 10cm is made of a metal of linear expansivity 2x 10^{-5}K^{-1}. As the plate is heated from 30^{0}C to 100^{0}C, the area of one face of the plate will increase to

(a) 100.1cm^2 (b) 100.3cm^2 (c) 101.4cm^2 (d) 102.8cm^2

The correct option is B

321. A metal cube of volume V and linear expansivity α is heated through a temperature rise of T. The increase in volume of the cube is (a) $3\alpha VT$ (b) $2\alpha VT$ (c) αVT (d) $\alpha VT/3$

The correct option is A

322. A metal cube of side 5 cm and linear expansivity $2 \times 10^{-5}K^{-1}$ is moved from an ice-water mixture into boiling water. The increase in the volume of the cube is (a) $0.25cm^3$ (b) $0.50cm^3$ (c) $0.75cm^3$ (d) $1.50cm^3$

The correct option is C

323. A glass bottle of initial volume 2×10^4 cm3 is heated from 20^0C to 50^0C. If the linear expansivity of glass is $9 \times 10^{-6}K^{-1}$, the volume of the bottle at 50^0C is (a) $20,005.4cm^3$ (b) $20,008.1cm^3$ (c) $20,013.5cm^3$ (d) $20,016.2cm^3$

The correct option is D

324. A glass flask of volume $1,00cm^3$ filled with mercury is heated from 30^0C to 80^0C. If the cubic expansivity of glass and mercury are $2.4 \times 10^{-4}K^{-1}$ and $1.8 \times 10^{-4}K^1$ respectively, the apparent increase in volume of mercury is (a) $3.0cm^3$ (b) $-30cm^3$ (c) $9.0cm^3$ (d) $12.0cm^3$

The correct option is B

325. A density bottle of volume 500 cm^3 is filled with a liquid and heated from 20^0C to 60^0C. If $7.5cm^3$ of liquid is expelled, the apparent cubic expansivity of the liquid is

    (a) $7.50 \times 10^{-5}K^{-1}$ (b) $1.88 \times 10^{-4}K^{-1}$ (c) $3.75 \times 10^{-5}K^{-1}$ (d) $7.50 \times 10^{-4}K^{-1}$

The correct option is C

326. A brass ball of volume $1,000mm^3$ is moved from room temperature (30^0C) to an ice-water mixture at 0^0C. If the linear expansivity of brass is $2 \times 10^{-5}K^{-1}$, the new volume of the ball is (a) $1,001.8cm^3$ (b) $1,000.6mm^3$ (c) $999.4mm^3$ (d) $988.2mm^3$

The correct option is D

327. A fixed mass of gas occupies a volume of $1,200cm^3$ at a temperature of 27^0C. The change in volume as the gas is cooled at constant pressure to 0^0C is (a) $108cm^3$ (b) $216cm^3$ (c) $273cm^3$ (d) $300cm^3$

The correct option is A

328. A gas occupies a certain volume at 27^0C. If it is heated at constant pressure, its volume is exactly doubled at a temperature of (a) 54^0C (b) 219^0C (c) 327^0C (d) 600^0C

The correct option is C

329. A fixed mass of gas at standard temperature and pressure is heated at constant volume. The temperature at which its pressure becomes equal to 228 cm of mercury is (a) 819^0C (b) 546^0C (c) 273^0C (d) 0^0C

The correct option is B

330. A gas occupies a volume of 819 cm^3 at 0^0C. If the gas is cooled at constant pressure, the temperature at which its volume drops to $480cm^3$ is (a) -113^0C (b) -56.5^0C (c) 0^0C (d) 160^0C

The correct option is A

331. A certain mass of gas exerts a pressure of $20Nm^{-2}$ at a temperature of 127^0C. If the gas is heated while maintaining its volume constant, the pressure exerted by the gas at 254^0C is

    (a) $10.00Nm^{-2}$ (b) $26.35 Nm^{-2}$ (c) $45.8 Nm^{-2}$ (d) $32.7 Nm^{-2}$

The correct option is B

332. A tyre is pumped to a pressure of 30 Nm^{-2} at 27^0C. When the tyre heats up to 54^0C the new pressure, assuming no change in volume, is (a) $60.0 Nm^{-2}$ (b) $54.0 Nm^{-2}$ (c) $45.8 Nm^{-2}$ (d) $32.7 Nm^{-2}$

The correct option is D

333. An air bubble of volume 1cm^3 initially at a depth of 15m below the water surface rises to the surface. If the atmospheric pressure is equal to 10m of water, the volume of the bubble just before it reaches the water surface is (a) 0.25cm^3 (b) 0.67cm^3 (c) 1.50cm^3 (d) 2.50cm^3

    The correct option is D

334. The equation $P^aV^bT^c$ = constant reduces to *Boyle's law* if (a) $a = 1, b = 0 \ and \ c = 0$ (b) $a = 1, b = 1 \ and \ c = 0$ (c) $a = 0, b = 0 \ and \ c = 1$ (d) $a = 1, b = 1 \ and \ c = 1$

    The correct option is B

335. The equation in question 334 reduces to *Charles' law* if (a) $a = 1, b = 0 \ and \ c = 1$ (b) $a = 0, b = 1 \ and \ c = 1$ (c) $a = 0, b = 1 \ and \ c = -1$ (d) $a = 1, b = 1 \ and \ c = 0$
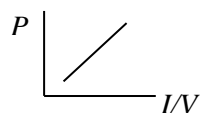
    The correct option is C

336. The product of pressure (P) and volume (V) has the unit of (a) Force (b) Power (c) Impulse (d) Work
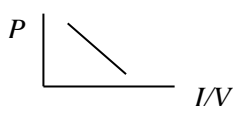
    The correct option is D

337. In an experiment on gases the pressure (P) of the gas is plotted against the reciprocal of the volume $\left(\frac{1}{V}\right)$ of the gas at constant temperature. Which of the following graphs correctly illustrates the relationship between P and I/V?
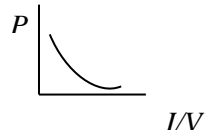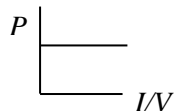
    (a)

    (b)

    (c)

    (d)

    The correct option is A

338. At the absolute zero of temperature

    I.   Thermal motion ceases

    II.   The pressure of a gas is zero

    III.   The mass of a gas is zero

    IV.   Ice melts

    Which of the above statements are correct?

    (a) I and II only (b) III and IV only (c) I, II and III only (d) II, III and IV only

    The correct option is A

339. A fixed mass of gas occupying a certain volume has its pressure reduced to 25 percent of its original value while the temperature is maintained constant. The ratio of the new volume to the original volume is (a) 2:1 (b) 1:2 (c) 1:4 (d) 4:1

    The correct option is D

340. A little quantity of air is trapped on top of the mercury column in a barometer. When the volume of the trapped air is 7.5cm^3 and the atmospheric pressure is 76cm, the barometer reads 74.0cm. When the volume of the trapped air is 10cm^3 and the barometer reads 73.0cm, the correct atmospheric pressure is (a) 75.5cm (b) 75.0cm (c) 74.5cm (d) 74.0cm

    The correct option is C

341. The volume of a certain mass of gas is doubled while its absolute temperature is halved. The pressure of the gas (a) Remains unchanged (b) Is halved (c) Increases by a factor of 4 (d) Decrease by a factor of 4 **The correct option is D**

342. A certain mass of gas is trapped in a tube of volume V at a temperature of 27^{0}C. If the pressure on the gas is doubled such that its volume is reduced to 75 percent of its original value, the new temperature of the gas is (a) -73.0^{0}C (b) 40.5^{0}C (c) 177.0^{0}C (d) 450.0^{0}C

The correct option is C

343.   The pressure of a fixed mass of gas is reduced from three atmospheres to 1 atmosphere. While its temperature increases from -73^0C to 127^0C. The ratio of the final volume of the gas to its initial volume is (a) 6:1 (b) 1:6 (c) 3:2 (d) 2:3

The correct option is A

344.   A certain mass of gas at -123^0C occupies a volume of $10m^3$ under a pressure of 4×10^5 NM^{-2}. If the gas occupies a volume of $20m^3$ at 27^0C. its pressure is (a) $8 \times 10^5 Nm^{-2}$ (b) $4 \times 10^5 Nm^{-2}$ (c) $2 \times 10^5 Nm^{-2}$ (d) $1 \times 10^5 Nm^{-2}$

The correct option is B

345.   A certain mass of gas occupies a volume of $3 \times 10^4 Nm^3$ at 31^0Cunder a pressure of 76 cm of mercury. When the pressure is reduced to 50cm of mercury and the temperature is increased to 127^0C, its volume is (a) 3×10^4 cm^3 (b) 4×10^4 cm^3 (c) 6×10^4 cm^3 (d) 1.2×10^5 cm^3

The correct option is C