(OBJECTIVE PART)

1. Computer chips are made of:
(a) Silicon (b) Germanium (c) Carbon (d) Gold

2. Which is not a base unit in SI units?
(a) Kilogram (b) Joule (c) Ampere (d) Kelvin

3. 1 Giga is equal to:
(a) 10^3 (b) 10^6 (c) 10^9 (d) 10^{12}

4. S.I unit of intensity of light is:
(a) Ampere (b) Mole (c) Candela (d) Joule

5. The ratio of 1 nanometer to 1 attometer is:
(a) 10^9 (b) 10^8 (c) 10^{-9} (d) 10^{-8}

6. Which of the following is least multiple?
(a) Pico (b) Femto (c) Nano (d) Atto

7. SI unit of plane angle is:
(a) Radian (b) Degree (c) Sterdian (d) Revolution

8. The SI unit of solid angle is:
(a) Steradian (b) Radian (c) Degree (d) Revolution

9. How many nanometers in a meter?
(a) 10^{19} (b) 10^{-19} (c) 10^9 (d) 10^{-9}

10. Which one of the following is not allowed as standard prefix?
(a) Kilo (b) Nano (c) Mega (d) Micro Micro

11. Kg m-1 s-2 is the unit of:
(a) Force (b) Work (c) Pressure (d) Momentum

12. Physical quantity "pressure" in term of base unit is:
(a) Kg m^{-1} s^{-2} (b) Kg m^2 s^{-3} (c) Kg^2 m^{-2} s (d) Kg m^1 s^{-2}

13. How many seconds are there in one year?
(a) 3.156×10^6 s (b) 3.1536×10^7 s
(c) 3.1536×10^{10} s (d) 3.1536×10^{-7} s

14. 2^o is equal:
(a) 0.035 rad (b) 0.30 rad (c) 0.35 rad (d) 0.0035 rad

15. One radian is equal to:
(a) 77.3° (b) 67.3° (c) 57.3° (d) 47.3°

16. Pascal is the unit of:
(a) Pressure (b) Force (c) Tension (d) Weight

17. Which one of the following is not a unit of energy?
(a) Kilowatt (b) Erg (c) Joule (d) Kilowatt hour

18. One radian is equal to:
(a) 57.3 (b) 67.3 (c) 87.3 (d) 60

19. Zero error of an instrument is a type of:
(a) Systematic error (b) Classified error

20. Least count of meter rod is:
(a) 0.01 cm (b) 0.001 cm (c) 0.1 cm (d) 1 cm

21. Significant figures in 8.70×10^4 kg are:
(a) 2 (b) 3 (c) 4 (d) 5

22. If we round off 64.34546 up to three significant figures, the best answer is:
a. (a) 64.3 (b) 64.4 (c) 64.5 (d) 64.6

23. A precise measurement is the one which has:
(a) Greater precision (b) Less precision
(c) Medium precision (d) More % error

24. For total assessment of uncertainty in the final result obtained by multiplication and division:
(a) Absolute uncertainties are added
(b) Fractional uncertainties are added
(c) % age uncertainties are added
(d) Error are added

25. The time taken by light from moon to earth is:
(a) 1 min 10 sec (b) 1 min 20 sec (c) 1 min 30 sec (d) 1 min 40 sec

26. A measurement taken by vernier callipers with least count as 0.01 cm is recorded as 0.45 cm, it has fractional uncertainty:
(a) 0.01 (b) 0.02 (c) 0.03 (d) 0.45

27. Length of an object is recoded as 25.5 cm by using a meter rod having smallest division in millimetre. The fractional uncertainty is:
(a) 0.400 (b) 2.550 (c) 0.004 (d) 0.100

28. If r = 2.25 ± 0.01 cm then (%) percentage uncertainty in r is:
(a) 0.225% (b) 22.5% (c) 0.2% (d) 0.4%

29. The dimensions of force is:
(a) $[ML^2T^{-2}]$ (b) $[MLT^{-1}]$ (c) $[MLT^{-2}]$ (d) $[ML^2T^{-2}]$

30. Dimensions of coefficient of viscosity are:
(a) $[MLT^{-1}]$ (b) $[ML^1T^1]$ (c) $[ML^1T^2]$ (d) $[M^1L^{-1}T^{-1}]$

31. The dimension of angular momentum are:
(a) $[MLT^2]$ (b) $[MLT^{-1}]$ (c) $[ML^2T^{-1}]$ (d) $[ML^2T^2]$

32. The dimension of $\sqrt{\frac{l}{g}}$ is same as that of:
(a) Time (b) Energy (c) Velocity (d) Force

33. The dimension of the relation are equal $\sqrt{\frac{F \times l}{m}}$ to the dimension of:
(a) Force (b) Momentum (c) Acceleration (d) Velocity

34. Light year is the unit of:
(a) Time (b) Distance (c) Energy (d) Torque

35. The dimensions of torque are:
(a) $[MLT^2]$ (b) $[ML^{-1}T^{-2}]$ (c) $[ML^{-1}T^{-1}]$ (d) $[ML^2T^2]$

36. Dimensions of ratio of angular momentum to linear momentum is:
(a) $[M^oLT^o]$ (b) $[M^1LT^1]$ (c) $[M^1L^2T^{-1}]$ (d) $[M^{-1}L^{-1}T^1]$

37. The dimensions of Einstein equation are $E = mc^2$:
(a) $[MLT^{-2}]$ (b) $[ML^{-1}T^2]$ (c) $[ML^2T^{-2}]$ (d) $[ML^{-2}T^2]$

38. Which of the following is correct:
(a) $f = V\lambda$ (b) $f = \frac{V}{\lambda}$ (c) $f = \frac{1}{V\lambda}$ (d) $f = \frac{\lambda}{V}$

39. The dimensions of pressure are:
(a) $[MLT^2]$ (b) $[ML^2T^2]$ (c) $[ML^{-1}T^2]$ (d) $[MLT^{-3}]$

40. The resultant of two forces 30 N and 40 N acting parallel to each other is:
(A) 30 N (B) 40 N (C) 70 N (D) 10 N 2015

41. The resultant of two vectors having magnitude 12 N and 8 N cannot be:
(A) 2N (B) 20 N (C) 10 N (D) 16 N

42. If $\vec{B} = 4\hat{i} + 5\hat{k}$, then its magnitude will be:
(A) 9 (B) $\sqrt{41}$ (C) 7 (D) 3

43. A force of 10 N makes an angle 30° with y-axis. Then magnitude of x-component is:
(A) 5N (B) 8.66 N (C) 10N (D) Zero

44. The position vector $\hat{r}$ in xz - plane is:
(A) $v\hat{i} + z\hat{k}$ (B) $x\hat{i} + y\hat{k}$ (C) $x\hat{i} + z\hat{k}$ (D) $x\hat{i}+y\hat{k}+z\hat{k}$

45. Unit vector of a given vector $\vec{A} = 4\hat{i} + 3\hat{j}$ is:
(A) $\frac{4\hat{i}+3\hat{j}}{25}$ (B) 1 (C) $\frac{4\hat{i}+3\hat{j}}{5}$ (D) $\frac{\sqrt{4\hat{i}+3\hat{j}}}{5}$

46. Rectangular components have angle between them is:
(A) 30° (B) 45° (C) 60° (D) 90°

47. Which of the following is the only scalar quantity?
(A) Energy (B) Velocity (C) Force (D) Torque

48. Resultant of two perpendicular vectors of equal magnitude (say $\vec{A}$) will be:
(A) $\vec{A}$ (B) $2\vec{A}$ (C) $\sqrt{2}\vec{A}$ (D) $\vec{A}^2$

49. The magnitude of the resultant of two forces 6 N and 8 N acting at right angle is:
(A) 6N (B) 10N (C) 14 N (D) 16 N

50. The reverse process of vector addition is called:
(A) Subtraction of vectors (B) Resolution of a vector
(C) Negative of a vector (D) Multiplication of a vector

51. The resultant of 120 N and 20 N forces can not
(A) 141 N (B) 100 N (C) 101 N (D) 130 N

52. The angle of A = Ax i - Ay J with x-axis will be in between:
(A) 0° and 90° (B) 90° and 180°
(C) 180° and 270° (D) 270° and 360° 30

53. If two unit vectors perpendicular to each other are added, magnitude of resultant.
(a) 2 (B) $\sqrt{2}$ (C) $\frac{1}{\sqrt{2}}$ (D) 4

54. Angle between two vectors $3\hat{i} + 4\hat{j}$ and $4\hat{i} - 3\hat{j}$ is:
(A) 30° (B) 90° (C) 60° (D) 45°

55. The force of 15 N makes an angle of 90° with x- axis, its y- component is:
(A) 15 N (B) Zero N (C) 30 N (D) 45 N

56. If the two components of a vector are equal in magnitude, the vector making angle with x-axis will be:
(A) 30° (B) 45° (C) 60° (D) 90°

57. In which quadrant vector $2\hat{i} - 3\hat{j}$ lies?
(A) 1st (B) 2nd (C) 4th (D) 3rd

58. The sum of two perpendicular forces 8 N and 6 N is:
(A) 2 N (B) 14 N (C) 10 N (D) -2N.

59. If a force of 10 N is acting along x-axis then its component along y-axis is:
(A) Zero (B) 5 N (C) 10 N (D) 15 N

60. If R_x is negative and R_y is positive and resultant lies in quadrant:
(A) 1st (B) 2nd (C) 3rd (D) 4th

61. The vector product $(\vec{A} \times \vec{A})$ is:
(A) $\vec{F}$ (B) F (C) Zero (D) Null vector

62. The area of the parallelogram formed by A and B as two adjacent sides is equal to:
(A) AB (B) AB cos θ (C) AB sin θ (D) AB tan θ

63. The cross product $\hat{k} \times \hat{j}$ is equal to:
(A) $-\hat{i}$ (B) $-\hat{j}$ (C) $-\hat{k}$ (D) $\hat{i}$

64. If two non-zero vectors $\vec{A}$ and $\vec{B}$ are parallel to each other than:
(A) $\vec{A}.\vec{B} = 0$ (B) $\vec{A}.\vec{B} = AB$ (C) $|\vec{A} \times \vec{B}| = AB$ (D) $(\vec{A} \times \vec{B}) = \vec{A}.\vec{B}$

65. If $\vec{A} \times \vec{B} = 0$, then angle between the vectors is:
(A) 90° (B) 180° (C) 0° (D) None of these

66. AB sin θ $\hat{n}$ x AB sin θ $\hat{n}$ is:
$A^2B^2 \sin^2\theta$ (B) A^2B^2 (C) $A^2B^2\,\hat{n}$ (D) 0

67. Projection B along A is given as:
(A) $\hat{A}.\vec{A}$ (B) $\vec{B}.\hat{A}$ (C) $\frac{\hat{A}.\vec{B}}{B}$ (D) $\frac{A\cos\theta}{B}$

68. $\hat{i}.(\hat{k} \times \hat{i})$ = _____
(A) 1 (B) 0 (C) $\hat{i}$ (D) $\hat{k}$

69. The magnitude of $\hat{i} \times \hat{j}$ is equal to:
(A) 1 (B) -1 (C) $-\hat{j}$ (D) $+\hat{k}$

70. The dot product $\hat{i}.\hat{i}$ is equal to:
(A) 0 (B) 1 (C) -1 (D) $\hat{j}$

71. $\hat{i}.\hat{i} = \hat{j}.\hat{j} = \hat{k}.\hat{k}$ is equal to:
(A) 0 (B) 1 (C) -1 (D) 2

72. The complete requirements for a body to be in equilibrium is:
(A) $\Sigma F = 0$ (B) $\Sigma \tau = 0$ (C) $\Sigma P = 0$ (D) $\Sigma F = 0, \Sigma \tau = 0$

73. The dot product of two vectors A and B zero,if angle between A and B is:
(A) Zero (B) 30° (C) 90° (D) 180°

74. Speed of moon around the earth is:
(A)1200 m/s (B) 1100 m/s (C) 1000 m/s (D) 900 m/s

75. When a ball is thrown straight up, the acceleration at its highest point is:
(A) Upward (B) Downward (C) Zero (D) Horizontal

76. Unit of acceleration is:
(A) ms^{-1} (B) ms (C) ms^{-2} (D) $m^{-2}S$

77. If a mass of a body is doubled, then acceleration becomes:
(A) double (B) half (C) one fourth (D) Constant

78. A body covers a distance of 10 m in 1 sec with a constant velocity of 10 ms^{-1} Acceleration produced by the body is:
(A) 0 ms (B) 2 ms^2 (C) 5 ms (D) 10 ms

79. If the mass of a body is acceleration becomes: doubled, then acceleration becomes:
(A) One fourth (B) Half (C) Double (D) Constant

80. 10 N and 20 N are acting on a body of mass 2 kg, the minimum acceleration will be:
(A) 10 ms^{-2} (B) 20 ms^{-2} (C) 60 ms^{-2} (D) 5 ms^{-2}

81. The velocity of a body changes with constant rate. Then acceleration is:
(A) Zero (B) Constant (C) Negative (D) Positive

82. Slope of velocity time graph describes a physical quantity called:
(A) Displacement (B) Average velocity
(C) Average acceleration (D) Momentum

83. When the body moves with constant acceleration, the velocity time-graph is:

(A) Parabola (B) Hyperbola (C) Straight line (D) Curve

84. The area under velocity time graph is equal to:
(A) Distance (B) Power (C) Force (D) Work

85. The distance covered by a body with uniform acceleration "a" in time "t" starting from rest is:
(A) $\frac{1}{2}at^2$ (B) vt (C) $\frac{1}{2}vt$ (D) $\frac{1}{2}a^2t$

86. If velocity-time graph is parallel to time axis, then acceleration of moving body will be:
(A) Maximum (B) Positive (C) Zero (D) Negative

87. A bullet shot straight up, returns to its starting point in 10 second. Its initial speed was:
(A) 9.8 ms^{-1} (B) 24.5 ms^{-1} (C) 49 ms^{-1} (D) 98 ms^{-1}

88. Velocity of an object dropped from a building at any instant "t" is given by:
(A) $\frac{1}{2}gt^2$ (B) $v_it + \frac{1}{2}gt^2$ (C) at (D) gt

89. Distance travelled by free falling object in first second is:
(A) 4.9 m (B) 9.8 m (C) 19.6 m (D) 10 m

90. The mass of an object is quantitative measure of its:
(A) Momentum (B) Acceleration (C) Inertia (D) Energy

91. S.I unit of linear momentum is:
(A) kg m^2 s^{-1} (B) kg m^2 s^{-2} (C) kg $m^{-1}s^{-1}$ (D) kg m s^{-1}

92. S.I unit of impulse is equivalent to that of:
(A) Force (B) Momentum (C) Acceleration (D) Velocity

93. SI unit of impulse is:
(A) $kgms^{-1}$ (B) N.m (C) Ns (D) $N.m^2$

94. A force of 10 N acts on a body of mass 1 kg for 5 sec to a distance of 10 m. The rate of change of momentum is:
(A) 50 N (B) 25 N (C) 20 N (D) 10 N

95. The force due to water flow is:
(A) F = mv (B) $F = \frac{ma}{t}$ (C) $F = \frac{mv}{t}$ (D) $F = \frac{mt}{v}$

96. For a typical rocket, how much mass of rocket is in the form of fuel?
(A) 60% (B) 50% (C) 80% (D) 100%

97. The overcome gravity, fuel consumed by rocket is:
(A) 40000 Kgs (B)30000 Kgs (C) 20000 Kgs (D) 10000 Kgs

98. A typical rocket consumes about 10,000 kgs^{-1} of fuel and ejects the burnt gases at speeds of over:
(A) 2000 ms^1 (B) 3000 ms (C) 4000 ms^1 (D) 5000 ms

99. Acceleration of rocket is given by the relation:
(A)$a = \frac{m}{mv}$ (B) $a = \frac{mv}{M}$ (C) $a = \frac{m}{Mv}$ (D) $a = \frac{Mv}{m}$

100. Motion of projectile is:
(A) One dimensional (B) Two dimensional
a. (C) Three dimensional (D) Four dimensional

101. The horizontal range of a projectile is maximum, when it is projected at an angle of:
(A) 0° (B) 30° (C) 45° (D) 60°

102. OR For maximum range the angle of projection must be:
(A) 30° (B) 45° (C) 60° (D) 90°

103. The horizontal component of velocity of projectile:
(A) Increase (B) Decreases
(C) Remains Same (D) Decreases and then increases

104. The ballistic missiles
(A) Long range (B) Short range (C) Medium range (D) Constant range

105. If maximum height of the projectile is equal to the range then angle of projection of projectile will be:
(A) 30° (B) 60° (C) 45° (D) 76°

106. Maximum height of projectile:
(A) $h = \frac{v_i^2 Sin^2\theta}{2g}$ (B) $h = \frac{v_i^2 Sin^2\theta}{g}$ (C) $h = \frac{v_i^2}{2g}$ (D) $h = \frac{v_i^2}{g}$

107. The trajectory of a projectile is:
(A) Circle (B) Parabola (C) Hyperbola (D) Straight line

108. The shape of trajectory of short range projectile is:
(A) Straight line (B) circle (C) Elliptical (D) Parabolic

109. The path followed by a projectile in known as its:
(A) Range (B) Trajectory (C) Cycle (D) Height

110. The maximum horizontal range of a projectile is given by:
(A) $\frac{v_i^2}{g}$ (B) $\frac{v_i^2}{2g}$ (C) $\frac{2v_i}{g}$ (D) $\frac{2v_i^2}{g}$

111. The acceleration of a projectile along x-axis is:
(A) Zero (B) Increases (C) Decreases (D) Equal to "g"

112. Which shows correct relation between H and T of projectile?

(A) $H = \frac{gT^2}{8}$ (B) $H = \frac{8T^2}{g}$ (C) $H = \frac{8g}{T^2}$ (D) $H = \frac{8}{8T^2}$

113. A ball is thrown up at an angle of 60° with horizontal, with a speed of 14ms^{-1} the velocity of the ball at the highest point is:

(A) 14 m/s (B) Om/s (C) 7m/s (D) 16m/s

114. Time of flight of a projectile is:

(A) $\frac{v_1 \sin\theta}{g}$ (B) $\frac{v_1 \sin\theta}{2g}$ (C) $\frac{v_1^2 \sin\theta}{g}$ (D) $\frac{2v_1 \sin\theta}{g}$

115. The horizontal range of projectile is:

(A) $\frac{2v_1 \sin\theta}{g}$ (B) $\frac{v_1 \sin 2\theta}{g}$ (C) $\frac{v_1^2 \sin 2\theta}{g}$ (D) $\frac{v_1 \sin^2\theta}{g}$

116. S.I unit of work is:

(A) Newton (B) Watt (C) Pascal (D) Joule

117. Work done will be maximum when angle between F and d is:

(A) 180° (B) 90° (C) 60° (D) 0°

118. When the finite force is parallel to the direction of motion of the body, the work done is:

(A) Minimum (B) Maximum (C) Infinity (D) Varies

119. Kilo watt hour is the unit of:

(A) Power (B) Energy (C) Force (D) Torque

120. 3 joules of work is done in 3 seconds, then power is:

(A) 6 watt (B) 3 watt (C) 18 watt (D)1 watt

121. Which one is a conservative force?

(A) Elastic spring force (B) Frictional force

a. (C) Air resistance (D) Tension in the spring

122. The SI unit of product of pressure and volume is:

(A) Watt (B) Joule (C) Pascal (D) N m

123. Scalar product of force and velocity is:

(A) Work (B) Power (C) Energy (D) Acceleration

124. Power is the dot product of force and:

(A) Acceleration(B) Mass (C) Velocity (D) Displacement

125. Power an electric heater is (approximate power)

(A) 1 kW (B) 2 kW (C) 3 kW (D) 4 kW

126. Consumption of energy by a 60 watt electric bulb in 2 seconds is:

(A) 120 J (B) 603 (C) 301 (D) 0.53

127. One watt hour is equal to:

(A) 3.6 MJ (B) 3.6 kJ (C) 36 kJ (D) 36 MJ

128. Kilo Watt-second is the unit of:

(A) Power (B) Energy (C) Momentum (D) Time

129. The escape velocity can be determined relation:

(A) $V_{esc} = gR$ (B) $V_{esc} = 2gR$ (C) $V_{esc} = \sqrt{gR}$ (D) $V_{esc} = \sqrt{2gR}$

130. The value of escape velocity for earth is:

(A) $11.6 \times 10^3 ms^{-1}$ (B) $11 \times 10^3 ms^{-1}$ (C) $11.5 \times 10^3 ms^{-1}$ (D) $12 \times 10^3 ms^{-1}$

131. Energy stored in spring is:

(A) Elastic P.E. (B) Gravitational P.E (C) K.E. (D) Chemical P.E.

132. The ratio of maximum orbital velocity and velocity is:

(A) $1:\sqrt{2}$ (8) 2:1 (C) $\sqrt{2}:1$ (D) 4 : 1

133. Mass is highly concentrated form of:

(A) Inertia (B) Energy (C) Plasma (D) Charge

134. In work-energy principle work done on a body is equal to:

(A) Kinetic energy (B) Potential energy

(C) Internal energy (D) change in K.E

135. The escape velocity is maximum for:

(A) Moon (B) Mercury (C) Earth (D) Jupiter

136. Energy dissipated usually appears as:

(A) Heat energy (B) Nuclear energy (C) P.E. (D) Chemical energy

137. Choice of zero potential energy level is:

(A) Surface of the Earth (B) At infinity

(C) At infinity Just above the surface of the Earth (D) Arbitrary

138. Conservation of Energy Original source of energy for biomass is:

(A) Earth (B) Moon (C) Sun (D) Star

139. Which one is renewable source of energy?

(A) Coal (B) Uranium (C) Biomass (D) Natural Gas

140. Which one is non-renewable source of energy?
(A) Wind (B) Biomass (C) Coal (D) Sunlight

141. The unit of solar light is:
(A) Watt (B) kW m^{-2} (C) Watt m^{-2} (D) J.m²

142. A layer of rock holding water that allows water to percolate through it with pressure is called:
1 kWh = :
(A) 3.6μ (B) 3.6mJ (C) 3.6kJ (D) 3.6MJ
(A) $\frac{\pi}{8}$ (B) $\frac{\pi}{6}$ (C) $\frac{\pi}{5}$ (D) $\frac{\pi}{12}$

143. One radian is equal to:
(A) 75.3° (B) 57.3° (C) 35.7° (D) 73.5°

144. The S.I unit of angular displacement
(A) Degree (B) Revolution (C) Radian (D) Rotation **OR** (A) Radian

145. In one revolution, the angular displacement covered is:
(A) 60° (B) 360° (C) 90° (D) 180°

146. If velocity and mass of a moving object are doubled then K.E becomes:
(A) Double (B) 4 times (C) 6 times (D) 8 times

147. If 20 waves pass through medium in one second with speed of 20 ms^{-1} the wavelength is:
(A) 20 m (B) 2m (C) 400 (D) 1 m

148. When a particle is moving along a circular path, its projection along the diameter executes:
(A) Linear motion (B) Vibratory motion (C) Rotatory motion (D) SHM

149. The angular velocity of the minute hand of a clock is:
(A) 2 π rads (B) π $rads^{-1}$ (C) $\frac{\pi}{60}$ rad s^{-1} (D) $\frac{\pi}{180}$ rad s^{-1}

150. The angular displacement per second is called angular:
(A) acceleration (B) speed (C) rotation (D) velocity

151. When a body is whirled in a horizontal circle by means of string, the centripetal force is supplied by:
(A) Mass of a body (B) Velocity of a body
(C) Tension in the string (D) Centripetal acceleration

152. Centripetal force performs:
(A) Maximum work (B) Minimum work
(C) Negative work (D) No work

153. Which one of the following is not directed along the axis of rotation?
(A) Angular acceleration (B) Angular momentum
(C) Centripetal acceleration (D) Angular displacement

154. If linear velocity and radius are both made to half a circle. Then it's of a body moving around centripetal force becomes:
(A) F_c (B) $\frac{F_c}{2}$ (C) $\frac{F_c}{4}$ (D) $2F_c$

155. If a body revolves under centripetal force, its angular acceleration is:
(A) Non zero (B) Variable (C) Increasing (D) Zero

156. The expression for centripetal force is given by:
(A) $\frac{mv^2}{r^2}$ (B) $\frac{m^2v^2}{r}$ (C) $\frac{m^2v^2}{r^2}$ (D) $mr\omega^2$

157. Escape velocity of object depends upon:
(A) Mass of object (B) Size of object
(C) Shape of object (D) Radius of planet

158. Moment of inertia of a solid sphere is:
(A) mr^2 (B) ½ mr^2 (C) 2/5 mr^2 (D) ¼ mr^2

159. Moment of inertia is measured in:
(A) kg m^2 (B) kg m^{-2} (C) Rad s^{-1} (D) Joule second

160. Moment of inertia of hoop is:
(A) mr^2 (B) $\frac{1}{2}$ mr^2 (C) $\frac{1}{5}$ mr^2 (D) $\frac{1}{12}$ mr^2

161. Momentum of inertia of rod is:
(A) I = $\frac{1}{2}$ mL^2 (B) I = $\frac{2}{5}$ mL^2 (C) I = $\frac{1}{12}$ m^2L (D) None of these

162. Moment of inertia for a particle is given by:
(A) m^2r^2 (B) mr^2 (C) m^2r (D) mr^{-2}

163. The S.I unit of angular momentum is given by:
(A) kgm^2s^{-1} (B) kgm^2s^{-2} (C) $kgms^{-2}$ (D) $kgms^{-1}$

164. Angular momentum of a rigid body is given by:J.S
(A) $I^2\omega$ (B) I ω^2 (C) $I^2\omega^2$ (D) Iω

165. For angular momentum of system to remain constant, external torque should be:
(A) Small (B) Large (C) Zero (D) None

166. If a body is moving counter clockwise, then angular displacement is:

(A) Minimum (B) Zero (C) Negative **(D)** Positive

167. The direction of angular momentum $\vec{L} = \vec{r} \times \vec{p}$ is:
(A) Along the direction of $\vec{p}$ (B) Along the direction of $\vec{r}$
(C) Parallel to the plane containing $\vec{r}$ and $\vec{p}$
(D) Perpendicular to the plane containing $\vec{r}$ and $\vec{p}$

168. The diver spins faster when moment of inertia becomes:
(A) Smaller (B) Greater (C) Constant (D) Zero

169. Speed of a hoop at the bottom of inclined plane is:
(A) $\sqrt{GH}$ (B) $\sqrt{2gh}$ (C) $\sqrt{\frac{4}{3}gh}$ (D) $\sqrt{4gh}$

170. The rotational K.E of a hoop of radius 'r' is:
(A) $\frac{1}{2}$ mr² ω² **(B)** $\frac{1}{2}$ mr² ω² (C) mr²ω² (D) $\frac{1}{2}$ r² ω²

171. The ratio of moment of inertia of a disc and hoop is:
(A) 2 (B) 4 **(C)** $\frac{1}{2}$ (D) $\frac{1}{4}$

172. OR The relation between the speed and hoop can be written:
(A) $v_{disc} = \sqrt{\frac{3}{4}}\, v_{hoop}$ (B) $v_{disc} = \sqrt{\frac{4}{3}}\, v_{hoop}$
(C) $v_{disc} = v_{hoop}$ **(D)** $v_{disc} = \frac{1}{2}\, v_{hoop}$

173. The ratio of velocity of disc to velocity of hoop is:
(A) $\frac{2}{\sqrt{3}}$ (B) $\frac{4}{\sqrt{3}}$ (C) $\frac{2}{3}$ (D) $\frac{4}{3}$

174. The rotational kinetic energy of a solid sphere is:
(A) $\frac{2}{5}$ mr² ω² (B) $\frac{2}{5}$ mv² **(C)** $\frac{1}{2}$ I ω² (D) $\frac{1}{2}$ I ω²

175. The rotational K.E of a hoop of mass "m" moving down frictionless inclined plane with velocity "v" will be:
(A) $\frac{1}{4}$ mv² **(B)** $\frac{1}{2}$ mv² (C) $\frac{3}{4}$ mv² (D) mv²

176. The linear velocity of a disc when it reaches the bottom of an inclined plane of height 'h' is:
(A) $\sqrt{gh}$ (B) $\sqrt{\frac{2}{3}gh}$ (C) $\sqrt{\frac{2}{4}gh}$ (D) $\sqrt{\frac{1}{3}gh}$

177. Relation between the speed of disc and hoop at the bottom of an incline is:
(A) $v_{disc} = \sqrt{\frac{3}{4}}\, v_{hoop}$ **(B)** $v_{disc} = \sqrt{\frac{4}{3}}\, v_{hoop}$
(C) $v_{disc} = \sqrt{\frac{2}{5}}\, v_{hoop}$ (D) $v_{disc} = 2\, v_{hoop}$

178. The rotational K.E of disc is equal to:
(A) $\frac{1}{4}\, mv^2$ (B) $\frac{1}{2}$ mv² (C) $\frac{1}{4}$ I ω² (D) lw²

179. A 20 metre high tank is full of water. A hole appears at its middle. The speed of efflux will be:
(A) 10 ms^{-1} **(B)** 14 ms^{-1} (C) 11.5 ms^{-1} (D) 9.8 ms^{-1}

180. The moment of inertia for a cylinder is:
(A) mr² **(B)** $\frac{1}{2}$ mr² (C) $\frac{2}{5}$ mr² (D) $\frac{1}{12}$ mr²

181. Rotational kinetic energy of the hoop moving down on inclined plane is:
(A) $\frac{1}{2}$ mv² (B) mv² (C) $\frac{1}{4}$ mv² (D) $\frac{3}{4}$ mv²

182. A hoop is rolled down on an inclined plane having height of 10 m. Its velocity at the bottom will be:
(A) 4.91 m/s **(B)** 9.89 m/s (C) 28.31 m/s (D) 31.31 m/s

183. The moment of inertia of solid disc or cylinder is:
(A) mr² **(B)** $\frac{1}{2}$ mr² (C) $\frac{1}{4}$ mr² (D) $\frac{1}{2}$ m²r

184. The value of "g" at the centre of the earth is:
(A) Infinite (B) 2g (C) 3g **(D)** Zero

185. The formula for speed of satellite orbiting around theEarth is:
(A) $v = \sqrt{2}\, gr$ (B) $v = \sqrt{2gR}$ **(C)** $v = \sqrt{gR}$ (D) $v = \sqrt{\frac{gR}{M}}$

186. If the radius of earth is doubled then the value of critical velocity becomes.
(A) $\frac{1}{\sqrt{2}}\, v_o$ (B) $\frac{1}{2}\, v_o$ **(C)** $\sqrt{2}\, v_o$ (D) $\frac{1}{4}\, v_o$

187. If the radius of earth is increased to four times of the present, critical velocity v, becomes.
(A) $\frac{v_o}{\sqrt{2}}$ (B) $\sqrt{2}\, v_o$ **(C)** 2 v_o (D) $\frac{1}{2}\, v_o$

188. The weight of the body at the centre of Earth is:
(A) Maximum (B) Minimum **(C)** Zero (D) Infinite

189. The expression for the orbital velocity of satellite is given by:

(A) $v = \sqrt{GMr}$ (B) $v = \frac{GM}{r}$ (C) $v = \sqrt{\frac{GM}{r}}$ (D) $v = \sqrt{\frac{r}{GM}}$

190. An orbital speed of a satellite can be determined by the equation:

(A) $\sqrt{2gR}$ (B) $\sqrt{\frac{2GM}{R}}$ (C) $\sqrt{gR}$ (D) $\sqrt{\frac{GM}{R}}$

191. The expression for the time period of low flying satellite put into the orbit is:

(A) $T = \frac{2\pi R}{g}$ (B) $T = \frac{2\pi R}{G}$ (C) $T = \frac{2\pi V}{R}$ (D) $T = \frac{2\pi R}{v}$

192. The period of revolution of a geostationary satellite is:

(A) 1 hour (B) 48 min (C) 1 day (D) 1 month **OR** (A)

193. As the speed of object moving through a fluid increases then the drag force experienced by it:

(A) Increases (B) Decreases
(C) Remains constant (D) Becomes: zero

194. Drag force is given by:

(A) Stoke's law (B) Bernoulli's equation
(C) Continuity equation (D) Newton's law

195. If the radius of droplet becomes half, then its terminal velocity will become:

Double (B) Half (C) One fourth (D) Remains same

196. The word FLUID means:

(A) To rise (B)To fall (C) To flow (D) To oppose

197. A fog droplet falls vertically through air with an acceleration:

(A) Equal to "g" (B) Less than "g" (C) Zero (D) Greater than "g"

198. Terminal velocity v_t is related with the radius r of a spherical object as:

(A) $v_t \propto r^2$ (B) $v_t \propto r$ (C) $v_t \propto \frac{1}{r}$ (D) $v_t \propto \frac{1}{r2}$

199. When droplet of water has terminal velocity the acceleration is:

(A) Maximum (B) Minimum (C) Zero (D) Constant

200. The S.I units of flow rate are:

(A) m^2s^{-1} (B) m^3s^{-2} (C) m^3s^{-1} (D) m^2s^{-2}

201. A hose pipe ejects water at a speed of 0.3 ms^{-1} through a hole of area 10 cm^2, flow rate will be:

(A) $3m^3s^{-1}$ (B) $3x10^{-3}m^3s^{-1}$ (C) 30 m^3s^{-1} (D) 0.03 m^3s^{-1}

202. The pressure will be low where the speed of fluid is:

(A) High (B) Low (C) Zero (D) Constant

203. Bunsen burner works on the principle of

(A) Venturi effect (B) Terricilli's effect
(C) Bernoulli's effect (D) None of these

204. The dimensions of potential energy volume are same as that of per unit

(A) Work (B) Pressure (C) Speed (D) Density

205. The dimensions of pgh has same as that of

(A) Work (B) Energy (C) Pressure (D) Mass

206. The term in Bernoulli's equation has the same unit as:

(A) Work (B) Volume (C) Pressure (D) Force

207. The unit of $\frac{1}{2}pV^2$ in Bernoull's equation is same as that of:

(A) Energy (B) Pressure (C) Work (D) Power

208. The term $\frac{1}{2}pv^2$ in Bernoulli's equation represents:

(A) K.E of fluid (B) Pressure energy
(C) k.E per unit volume (D) P.E of fluid

209. Blood has density equal to that of:

(A) Mercury (B) Sodium (C) Honey (D) Water

210. The density of blood is nearly equal to:

(A) Air (B) Water (C) Milk (D) Honey

211. One torr is equal to:

(A) 120 Pascals (B) 100 Pascals (C) 133.3 Pascals (D) 80 Pascals

212. The relation $v_2 = \sqrt{2g(h_1 - h_2)}$ is called:

(A) Torricelli's theorem (B) Ventusi relation
(C) Stoke's law (D) Equation of continuity

213. Speed of efflux is measured by the relation:

(A) $v = \sqrt{gh}$ (B) $v = \sqrt{\frac{gh}{2}}$ (C) $v = \sqrt{2gh}$ (D) $\sqrt{\frac{4}{3}}gh$

214. Torricelli's theorem can be written as:

(A) $V = \sqrt{2g(h_1 - h_2)}$ (B) $V = 2g\,(h_1 - h_2)$

(C) $V = 2g\sqrt{(h_1 - h_2)}$ (D) $V = \sqrt{2g}\,(h_1 - h_2)$

215. The relation between time period and frequency is:

(A) $f = 2\pi T$ (B) $f = \frac{1}{2\pi T}$ (C) $f = \frac{1}{2\pi}$ (D) $fT = 1$

216. The waveform of SHM is:

(A) Sine wave (B) Cosine wave (C) Tangent wave (D) Square wave

217. Phase difference between two points of a wave front is:

(A) Zero (B) $\frac{\pi}{2}$ (C) π (D) $\frac{3\pi}{2}$

218. When one-fourth of the cycle of a vibrating body is completed then the phase change in it is:

(A) $\frac{\pi}{4}$ radian (B) $\frac{\pi}{2}$ radian (C) $\frac{3\pi}{2}$ radian (D) π radian

219. The ratio of angular frequency and linear frequency is:

(A) 2π (B) π (C) $\frac{1}{2\pi}$ (D) $\frac{\pi}{2}$

220. When three-fourth of the cycle of a vibrating body is completed then the phase of vibration is:

(A) $\frac{\pi}{4}$ radian (B) $\frac{\pi}{2}$ radian (C) $\frac{3\pi}{2}$ radian (D) π radian

221. Which of the following quantity can be expressed in kg s^{-2}?

(A) Spring constant (B) Density (C) Momentum (D) Force

222. The expression for frequency of a mass 'm' attached to a spring of spring constant "k" is:

(A) $2\pi\sqrt{\frac{k}{m}}$ (B) $2\pi\sqrt{\frac{m}{k}}$ (C) $\frac{1}{2\pi}\sqrt{\frac{k}{m}}$ (D) $\frac{1}{2\pi}\sqrt{\frac{m}{k}}$

223. The time period of an oscillating mass spring system is 10 second. If mass attached to spring is

(A) Same (B) Twice (C) Thrice (D) Four times

224. The velocity of spring-mass vibrating system at mean position is:

(A) Zero (B) $\sqrt{\frac{k}{m}}$ (C) $x_{\circ}\sqrt{\frac{k}{m}}$ (D) $w\sqrt{\frac{k}{m}}$

225. The frequency of simple pendulum is given by:

(A) $\frac{1}{2\pi}\sqrt{\frac{g}{l}}$ (B) $2\pi\sqrt{\frac{g}{l}}$ (C) $\frac{1}{2\pi}\sqrt{\frac{g}{l}}$ (D) $2\pi\sqrt{\frac{l}{g}}$

226. If amplitude of a simple pendulum is increased by 4 times, the time period will be:

(A) Four times (B) Half (C) Same (D) Two times

227. A simple pendulum is completing 20 vibrations in 5 seconds, its frequency is:

(A) 4 Hz (B) 20 Hz (C) 200 Hz (D) 40 Hz

228. In order to double period of a simple pendulum the length of the pendulum should be increased by:

(A) Four times (B) Three times (C) Two times (D) Eight times

229. When the bob of simple pendulum is at extreme position then its K.E is:

(A) Maximum (B) Minimum (C) Zero (D) Small

230. If length of the simple pendulum is double then its period increases:

(A) 1.41 times (B) 2 times (C) 2.4 times (D) 3 times

231. The frequency of waves produced in microwave oven is:

(A) 1435 HZ (B) 2450 MHz (C) 1860 MHz (D) 2850 Hz

232. The wave produced in microwave oven have a wavelength of:

(A) 12 cm (B) 12 m (C) 8 m (D) 18 cm

233. At resonance, the transfer of energy is:

(A) Zero (B) Minimum (C) Maximum (D) Negative

234. The force responsible for the vibratory motion of simple pendulum is:

(A) mg cos θ (B) mg sin θ (C) mg sec θ (D) mg tan θ

235. Longitudinal waves do not exhibit.

(A) Reflection (B) Refraction (C) Polarization (D) Diffraction

236. Transverse waves are distinguished from longitudinal waves by the:

(A) Interference (B) Diffraction (C) Reflection (D) Polarization

237. Tuning fork is a source of:

(A) Energy (B) Heat (C) Light (D) Sound

238. Distance between two adjacent crests and trough is:

(A) λ (B) $\frac{\lambda}{2}$ (C) $\frac{\lambda}{4}$ (D) 2λ

239. The distance between a node and the next antinode is:

(A) 4λ (B) 2λ (C) $\frac{\lambda}{4}$ (D) $\frac{\lambda}{2}$

240. Wave transport:

(A) Energy (B) Wavelength (C) Power (D) Mass

241. The wavelength of transverse wave travelling with a speed 'v' having frequency 'f' in equal to:
(A) f/v (B) vf (C) v/f (D) f/v^2

242. Longitudinal waves of frequencies less than 20 Hz are known as:
(A) Infra sound (B) Ultra sound (C) Super sound (D) Audible sound

243. The distance between two consecutive crest is called:
(A) Displacement (B) Amplitude (C) Wave front (D) Wavelength

244. The distance between two consective trough is called:
(A) Displacement (B) Amplitude (C) Wave length (D) Wavelength

245. The value of constant γ for the mono-atomic gas is:
(A) 1.67 (B) 1.40 (C) 1.29 (D) 2.45

246. According to Newton, sound travels in air under conditions of:
(A) Adiabatic (B) Isothermal (C) Isobaric (D) Isochonc

247. According to Newton's formula, sound in air at STP is:
(A) 332 ms^{-1} (B) 340 ms^{-1} (C) 350 ms^{-1} (D) 280 ms^{-1}

248. Speed of sound in vacuum is:
(A) 280 ms^{-1} (B) 332 ms^{-1} (C) 333 ms^{-1} (D) 0 ms^{-1}

249. Laplace's expression for speed of sound in air is:
(A) $v = \frac{q}{p}$ (B) $v = \frac{p}{q}$ (C) $v = \sqrt{\frac{\gamma P}{P}}$ (D) $v = \sqrt{\frac{P}{rq}}$

250. The speed/velocity of sound is greatest in:
(A) Air (B) Steel (C) Ammonia (D) Water

251. The speed of sound is greater in solids due to Water their high:
(A) Density (B) Pressure (C) Temperature (D) Elasticity

252. The speed of sound in air does not depend upon:
(A) Temperature (B) Pressure (C) Density (D) Medium

253. Sound travel faster in:
(A) CO_2 (B) H_2 (C) O_2 (D) He

254. The error in speed of sound calculated by Newton at STP is about:
(A) 0% (B) 14% (C)15% (D) 16%

255. In which medium the speed of sound is greater?
(A) oxygen (B) air (C) water (D) copper

256. The louder the sound, the greater will be its:
(A) Speed (B) Frequency (C) Amplitude (D) Wavelength

257. Frequency range of hearing of cats is:
(A) 20-20000 Hz (B) 10-10000 Hz (C) 60 -20000 Hz (D) 60-70000 Hz

258. The velocity of sound is maximum at 20°C in:
(A) Lead (B) Copper (C) Glass (D) Iron

259. When sound waves enter in different medium, the quantity that remains unchanged is:
(A) Intensity (B) Speed (C) Frequency (D) Wavelength

260. Velocity of sound is independent of:
(A) Temperature (B) Density (C) Pressure (D) Medium

261. The process by Newton for the followed determination of speed of sound in air is:
(A) Adiabatic (B) Isothermal (C) Isobaric (D) Isochoric

262. Speed of sound in lead at 220°C is:
(A) 1320 m/s (B) 1330 m/s (C) 1340 m/s (D) 1350 m/s

263. The speed of sound approximately equal to:
(A) 332 m/s (B) 350 m/s (C) 340 m/s (D) 335 m/s

264. The speed of sound at a given temperature by doubling pressure speed of sound is:
(A) 0.5v (B) v (C) 2v (D) 3v

265. The path difference for constructive interference should be:
(A) $\frac{\lambda}{2}$ (B) $\frac{[illegible]\lambda}{2}$ (C) m λ (D) $\frac{3\lambda}{2}$

266. Constructive interference of two coherent beams is obtained if path difference is:
(A) $\frac{n\lambda}{2}$ (B) $\frac{n\lambda}{4}$ (C) $\frac{n(3\lambda)}{4}$ (D) n λ

267. When two identical waves superimposed, which can change?
(A) Wavelength (B) Frequency (C) Velocity (D) Amplitude

268. Beats can be heard when difference of frequency is not more than:
(A) 8 Hz (B) 10 Hz (C) 4 Hz (D) 6 Hz

269. The basic principle of beats is:
(A) Interference (B) Diffraction (C) Reflection (D) Refraction

270. When two notes of frequencies f_1 and f_2 are sounded together, beats are formed. If $f_1 > f_2$ what will be the beat frequency?

(A) $f_1 + f_2$ (B) $\frac{1}{2}(f_1 + f_2)$ (C) $f_1 - f_2$ (D) $\frac{1}{2}(f_1 - f_2)$

271. The distance between consecutive node and node:

(A) λ (B) $\frac{\lambda}{2}$ (C) 2 λ (D) $\frac{\lambda}{2}$

272. The distance between two consecutive nodes is:

(A) $\frac{\lambda}{2}$ (B) $\frac{\lambda}{4}$ (C) 2 λ (D) λ

273. In stationary waves, the velocity of particle at the node is:

(A) Maximum (B) Infinite (C) Zero (D) Variable

274. In stationary waves the points which always remain at rest are:

(A) nodes (B) antinodes (C) crest (D) trough

275. The distance between two consecutive antinode is:

(A) $\frac{\lambda}{2}$ (B) $\frac{\lambda}{2}$ (C) λ (D) 2 λ

276. If a stretch string vibrate in three loops. Then relation between its length and wavelength of stationary wave is:

(A) $l = \frac{3\lambda}{2}$ (B) $l = 3\lambda$ (C) $l = \frac{2\lambda}{3}$ (D) $\lambda = 3l$

277. The wavelength of fundamental node of vibration of an open end pipe is:

(A) 4l (B) 2l (C) l (D) $\frac{1}{4}$ 1

278. If the organ pipe is closed at one end, the frequency of fundamental harmonic is:

(A) $f_1 = \frac{v}{2l}$ (B) $f_1 = \frac{v}{4l}$ (C) $f_1 = \frac{4l}{v}$ (D) $f_1 = \frac{2l}{v}$

279. The distance between 1st node and 4th antinode is:

(A) $\frac{7}{4}\lambda$ (B) $\frac{5}{4}\lambda$ (C) $\frac{13}{4}\lambda$ (D) $\frac{11}{4}\lambda$

280. When one end of organ pipe is closed, then the frequency of stationary waves of any harmonic, it is given by:

(A) $f_n = \frac{nv}{2l}$ (B) $f_n = \frac{nl}{4v}$ (C) $f_n = \frac{4v}{nl}$ (D) $f_n = \frac{nv}{4l}$

281. If organ pipe is open at both ends, frequency of fundamental harmonic is given by:

(A) $v / 2l$ (B) $v / 4l$ (C) $4l / v$ (D) $2l / v$ 108.

282. When both ends of organ pipe are open then frequency of stationary waves of nth harmonic is given by:

(A) $f_n = \frac{nv}{4l}$ (B) $f_n = \frac{v}{2nl}$ (C) $f_n = \frac{nv}{2l}$ (D) $f_n = \frac{2v}{nl}$

283. When an observer is moving away from stationary source, sending waves with speed the waves received by him at the rate of:

(A) $\frac{v - u_o}{\lambda}$ (B) $\frac{v - u_o}{\lambda}$ (C) $\frac{\lambda}{v - u_o}$ (D) $\frac{\lambda}{v + u_o}$

284. Angle between ray of light and wave front is:

(A) 0° (B) 60° (C) 90° (D) 120°

285. In case of point source the shape of wave front is

(A) Plane (B) Spherical (C) Circular (D) Elliptical

286. The locus of all points in the same wave of vibration is called:

(A) Wave Front (B) Interference (C) Diffraction (D) Polarization

287. The fringe spacing increases if we use:

(A) Red light (B) Blue light (C) Yellow light (D) Green light

288. An oil film on water surface shows colour due to:

(A) Diffraction (B) Interference (C) Polarization (D) Dispersion

289. The blue colour of sky is due to:

(A) Diffraction (B) Reflection (C) Polarization (D) Scattering

290. Sodium in a flame gives:

(A) Green light (B) Blue light (C) White light (D) Yellow light

291. Light entering room air to glass does not change in its:

(A) Frequency (B) Wavelength (C) Velocity (D) Direction

292. In Young's double slit experiment, the fringe spacing is equal to:

(A) $\Delta Y = \frac{\lambda L}{d}$ (B) $\Delta Y = \frac{\lambda}{d}$ (C) $\Delta Y = \frac{\lambda}{Ld}$ (D) $\Delta Y = Ld\lambda$

293. Fringe spacing is equal to:

(A) $\frac{\lambda d}{L}$ (B) $\frac{\lambda L}{d}$ (C) $\frac{L}{\lambda d}$ (D) m λ

(C) Remain same (D) Becomes zero

294. If red light is used as compare to blue light then fringe spacing:

(A) Increases (B) Decreases (C) Remain same (D) Becomes zero

295. Thin film shows colours due to:

(A) Interference (B) Diffraction (C) Refraction (C) Polarization

296. Newton's rings are formed as a result of:

(A) Interference (B) Dispersion (C) Diffraction (D) Polarization

297. When Newton ring are seen through the transmitted light, then central spot is:
(A) Dark (B) Blue (C) Bright (D) Red

298. A glass grating has 5000 lines/cm, then grating element will be:
(A) 2×10^{-6} m (B) 2×10^{-4} m (C) 2×10^{-3} m (D) 2×10^{-7} m

299. The wavelength of X-rays is of the order of:
(A) 10^{-8} m (B) 10^{-5} m (C) 10^{-10} m (D) 10^{-4} m

300. Bragg's equation is given as:
(A) $2d\sin\theta = n\frac{\lambda}{2}$ (B) $2d\sin\theta = n\lambda$ (C) $d\sin\theta = n\frac{\lambda}{2}$ (D) $2d\sin\theta = 2\lambda$

301. Bragg's equation is given as:
(A) $d = \frac{2\sin\theta}{n\lambda}$ (B) $n = \frac{2d\sin\theta}{\lambda}$ (C) $d = \frac{2\lambda\sin\theta}{\lambda}$ (D) $d = \frac{2\lambda\sin\theta}{n}$

302. The process of confining the beam of light to vibrate in one plane is called:
(A) Interference (B) Diffraction
(C) Polarization (D) Total internal reflection

303. Which phenomenon of light proves waves are transverse in nature?
(A) Refraction (B) Reflection (C) Diffraction (D) Polarization

304. To distinguish between transverse and longitudinal wave______is used.
(A) Refraction (B) Interference (C) Polarization (D) Diffraction

305. Which one of the following cannot be polarized?
(A) Ultra violet rays (B) Radio waves (C) T.V waves (D) Sound waves

306. Intensity of light depend on:
(A) Wavelength (B) Amplitude (C) Velocity (D) Frequency

307. Which of the followings cannot produce colours with white light?
(A) Diffraction (B) Interference (C) Polarization (D) Dispersion

308. Rayleigh formula for resolving power:
(A) $R = \frac{1.22\lambda}{D}$ (B) $R = \frac{1.22D}{\lambda}$ (C) $R = \frac{D}{1.22\lambda}$ (D) $R = \frac{\lambda}{1.22D}$

309. The units of magnifying power of microscope or telescope are:
(A) Metre (B) m^{-1} (C) Dioptre (D) No unit

310. The magnifying power of simple microscope is:
(A) $1 + \frac{d}{p}$ (B) $1 - \frac{d}{f}$ (C) $1 - \frac{d}{p}$ (D) $1 + \frac{d}{f}$

311. Magnification of convex lens is:
(A) $1 + \frac{d}{f}$ (B) $1 - \frac{d}{f}$ (C) $1 + \frac{d}{f}$ (D) $1 - \frac{f}{d}$

312. If a convex lens of focal length "f" is cut into two identical halves along the Lens diameter, the focal length of each half is:
(A) $\frac{3}{2}f$ (B) $2f$ (C) $\frac{f}{2}$ (D) f

313. Magnifying power of telescope is:
(A) $\frac{f_e}{f_o}$ (B) $\frac{f_o}{f_e}$ (C) $f_e f_o$ (D) $\frac{1}{f_e f_o}$

314. In Michelson's experiment the angle subtended by a side of the eight sided mirror is:
(A) $\frac{\pi}{8}$ rad (B) $\frac{\pi}{4}$ rad (C) $\frac{\pi}{2}$ rad (D) $\frac{\pi}{6}$ rad

315. The detector in photo-phone is made up of:
(A) Cadmium (B) Germanium (C) Selenium (D) Silicon

316. The first person who attempted to measure the speed of light was:
(A) Michelson (B) Huygen (C) Galilleo (D) Newton

317. If the speed of light in vacuum is c, then its velocity in a medium of refractive index 1.3 is:
(A) 1.3 c (B) $\frac{1.3}{c}$ (C) $\frac{c}{1.3}$ (D) c

318. A layer over the central core of the Jack is called:
(A) Jacket (B) Plastic (C) Cladding (D) Rubber

319. Multimode step index fiber is useful for:
(A) Long distance (B) Short distance
(C) Very long distance (D) Infinite distance

320. In multimode step index fibre, the diameter of core is:
(A) 50μm (B) 5μm (C) 100μm (D) 150μm

321. The diameter of the core of the single mode step index fibre is:
(A) 10μm (B) 50 μm (C) 50μm to 1000 μm (D) 5 μm

322. In multimode step index fiber, the value of refractive index of core is:
(A) 1.33 (B) 1.52 (C) 1.67 (D) 1.48

323. Refractive index of water is:
(A) 1.5 (B) 1.33 (C) 1.0 (D) 1.2

(C) 1 ns per km (D) 1 ns per 100 km

324. For a gas obeying Boyle's law, if the pressure is doubled, the volume becomes:
(A) Double (B) Threefold (C) One half (D) Remains the same

325. The relation for absolute temperature of a gas is given by:
(A) $T = \frac{2}{3K} < \frac{1}{2} mv^2 >$ (B) $T = \frac{2K}{3} < \frac{1}{2} mv^2 >$
(C) $T = \frac{3}{2K} < \frac{1}{2} mv^2 >$ (D) $T = \frac{3K}{2} < \frac{1}{2} mv^2 >$

326. A device based upon the thermodynamics property of matter is called:
(A) Calorimeter (B) Heat engine (C) Thermometer (D) Voltmeter

327. Heat is form of:
(A) Power (B) Momentum (C) Energy (D) Torque

328. The ideal gas law is
(A) PV=NVK (B) P=NkT (C) PV=nRT (D) P=nRT

329. The value of Boltzman's constant is:
(A) 1.38×10^{-23} J/K (B) 1.38×10^{23} J/K
(C) 1.38×10^{-23} J/mol.K (D) 1.38×10^{23} J/mol.K

330. Pressure of a gas is given as:
(A) $\frac{1}{3} \rho <v^2>$ (B) $\frac{2}{3} \rho <v^2>$ (C) $\frac{1}{3} Ne<v^2>$ (D) None

331. S.I unit of pressure of gas is:
(A) Nm^{-2} (B) N.m (C) N^2/m (D) $N^2.m$

332. At constant temperature, if pressure of a given mass of gas is halved, then its volume becomes:
(A) Halve (B) Doubled (C) Four Time (D) Constant

333. At constant temperature and pressure, if volume of given mass of a gas is doubled then density is:
(A) Doubled (B) $\frac{1}{4}$ of original (C) $\frac{1}{2}$ of original (D) Unchanged

334. Boltzman constant, universal Avogadro number is related as:
(A) $K = \frac{R}{N_A}$ (B) $K = \frac{N_A}{K}$ (C) $R = \frac{1}{2}\ \frac{K}{N_A}$ (D) $R = NK \frac{N_A}{K}$

335. Boltzman constant "k" has same unit as:
(A) Temperature (B) Energy (C) Entropy (D) Pressure

336. If the temperature of a gas is constant then $<\frac{1}{2}mv^2>$ of the molecules of gas will be:
(A) Constant (B) Zero (C) Increase (D) Decrease

337. The mean kinetic energy of gas is at:
(A) 0°C (B) -273°C (C) 0K (D) 100° C

338. Solid ice, liquid water and water vapours consist in thermal equilibrium at a temperature:
(A) 273 K (B) 273.16 K (C) 273°C (D) 100°C

339. Root mean square velocity is related to the absolute temperature of an ideal gas as:
(A) $V_{max} \propto T$ (B) $V_{max} \propto T^2$ (C) $V_{max} \propto \sqrt{T}$ (D) $V_{max} \propto \frac{1}{\sqrt{T}}$

340. Pressure of an ideal gas can be written in terms of its density:
(A) $P = \rho <v^2>$ (B) $P = \frac{1}{3} \rho <v^2>$
(C) $P = \frac{2}{3} \rho <v^2>$ (D) $P = \frac{1}{3} \rho <v^2>$

341. A chimney works best when it is:
(A) Tall (B) Wide (C) Short (D) Narrow

342. Pressure of a gas is equal to:
(A) $\frac{2}{3} \rho <v^2>$ (B) $\frac{3}{2} \rho<v^2>$ (C) $\frac{1}{3} \rho<v^2>$ (D) $\rho <v^2>$

343. The K.E of molecules of an ideal gas at absolute zero will be:
(A) Zero (B) Infinite (C) Very high (D) Below zero
(A) Temperature(B) Pressure (C) Path (D) Final and initial state

344. For an ideal gas, the internal energy is directly proportional to:
(A) Temperature (B) Pressure (C) Volume (D) Mass

345. Pascal is the unit of:
(A) Pressure (B) Force (C) Tension (D) Weight

346. According to first law of thermodynamics the quantity which is conserved:
(A) Energy (B) Force (C) Momentum (D) Power

347. The first law of thermodynamics for an isothermal process is:
(A) Q = 0 (B) W = 0 (C) Q = W (D) $\Delta U = 0$

348. First law of thermodynamics for an adiabatic process will be written as:
(A) $W = \Delta U$ (B) W = Q (C) $W = Q - \Delta U$ (D) $W = -\Delta U$

349. The process which is carried out at constant temperature is known as:
(A) Adiabatic process (B) Isochoric process

(C) Isothermal process (D) Isobaric process

350. Which remains constant in an adiabatic process?

(A) Volume (B) Pressure (C) Entropy (D) Temperature

351. Entropy remains constant

(A) Isothermal process (B) Adiabatic process
(C) Isochoric Process (D) Isobaric process

352. The change in internal energy is defined as:

(A) Q - W (B) Q – T (C) Q + P (D) Q – P

353. The work done in isochoric process is:

(A) Constant (B) Variable
(C) Zero (D) Depend upon condition

354. In thermodynamics process, the equation W= - ΔU represents.

(A) Isothermal expansion (B) Variable
(C) Adiabatic expansion (D) Adiabatic compression

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

(A) Plank's constant (B) General gas constant
(C) Molar gas constant (D) Boltzmann constant

356. SI unit of molar specific heat is:

(A) J mol^{-1} K^{-1} (B) J mol K^{-1} (C) J mol K (D) J mol^{-1}

357. If one mole of an ideal gas is heated at constant volume then:

(A) $Q_p = C_v \Delta T$ (B) $W = C_V \Delta T$
(C) $Q_V = C_P \Delta T$ (D) $\Delta U = C_V \Delta T$

358. The value of universal gas constant 'R' is:

(A) 1.6J $mol^{-1}k^{-1}$ (B) 1/38 J mol^{-1} k^{-1}
(C) 8.314 J mol^{-1} k^{-1} (D) 6.02 J $mol^{-1}k^{-1}$

359. If one mole of an ideal gas is heated at constant pressure then:

(A) $Q_P = C_V \Delta T$ (B) $\Delta U = C_P \Delta T$
(C) $Q_V = C_P \Delta T$ (D) $\Delta U = C_V \Delta T$

360. The efficiency of heat engine whose sink is at 17°C and source at 200°C is:

(A) 38% (B) 65% (C) 80% (D) 90%

361. An ideal heat engine can only be 100% efficient its cold temperature reservoir is at:

(A) 0 K (B) 0°C (C) 100 K (D) 100 °C

362. Carnot cycle consists of:

(A) Two steps (B) Three steps (C) Four steps (D) Five steps

363. The measure of hotness or coldness of a substance is:

(A) Temperature (B) Heat (C) Internal energy (D) Energy

364. If heat engine absorbs 400 J and rejects 200 heat energy, its efficiency will be:

(A) 25% (B) 50% (C) 70% (D) 100%

365. Carnot engine consists of:

(A) Two steps (B) Three steps (C) Four steps (D) Five steps

366. In carnot engine, each process is:

(A) Reversible (B) Perfectly reversible
(C) Irreversible (D) Perfectly irreversible

367. Sadi carnot described an ideal engine in:

(A) 1640 (B) 1740 (C) 1940 (D) 1840

368. Value of triple point of water is given as:

(A) Zero K (B) 100 K (C) 273.16 K (D) 373.16 K

369. Unit of thermodynamics scale of temperature is:

(A) Centigrade (B) Fahrenheit (C) Kelvin (D) Celsius

370. The unit of entropy is:

(A) J K (B) J (C) $\frac{J}{K}$ (D) $\frac{K}{J}$

371. The change in entropy ΔS of a system is given by:

(A) $\Delta S = \frac{\Delta Q}{T}$ (B) $\Delta Q = \frac{\Delta S}{T}$ (C) $\Delta Q = \frac{T}{\Delta S}$ (D) ΔS = ΔQ x T

372. Entropy is measure of:

(A) Internal energy of system (B) Order of system
(C) Disorder of system (D) Potential energy of system

373. When temperature of source and sink of a heat engine becomes equal then the entropy change will be:

(A) Zero (B) Minimum (C) Maximum (D) Negative

374. Change in entropy of reversible process is:

(A) Positive (B) Negative (C) Zero (D) Adiabatic