(c) 40 cals   (d) none of these

38. A large iceberg melts at the base but not at the top because
    (a) ice at the top may be of a different kind of hard water
    (c) due to high pressure ice at the base lowers its melting point
    (c) ice at the base contains impurities
    (d) the base of iceberg remains in warmer surrounding

39. At what point is the Fahrenheit temperature double of Centigrade temperature
    (a) – 3.6°C   (b) – 8.3°C
    (c) 5.3°C   (d) – 12.3°C

40. Two blocks of ice when pressed together form one block because
    (a) of heat produced during pressing
    (b) melting point of ice decreases with increase in pressure
    (c) melting point of ice decreases with increase of pressure
    (d) of heat produced during pressing

41. One kilogram of ice at 0°C is mixed with 1 kg of water at 10°C. The resulting temperature will be
    (a) equal to zero   (b) less than 0°C
    (c) more than 0°C   (d) none of these

42. The Centigrade and Fahrenheit temperatures are same at point which is equal to
    (a) –10°C   (b) 0°C
    (c) 20°C   (d) – 40°C

43. More dew is formed on grass than on metallic utensils, because
    (a) grass being a good radiator enables the water vapour in the air to condense on it
    (b) grass is a good conductor
    (c) grass attract dew drops on account of photosynthesis
    (d) there is transpiration in plants

44. Tea will cool most early in a
    (a) glass cup   (b) clay cup
    (c) metal cup   (d) procelain cup

45. A block of wood is floating on water at 0°C with a certain volume above water level. The temperature of the water is slowly raised from 0°C to 20°C. How will the volume change with the rise of temperature

46. The temperature of the top of a frozen lake is –15°C. The temperature of the water in the lake in contact with the ice layer is
    (a) 5°C   (b) 4°C
    (c) 0°C   (d) – 4°C

47. The freezer in a refrigerator is fitted near the top
    (a) because of convenience
    (b) so that it can cool the whole interior by setting up convection currents
    (c) without any specific purpose
    (d) to keep it away from the hot compressor which is near the bottom

48. Theodlite is used by
    (a) physicists   (b) chemists
    (c) surveyors   (d) electronic engineers

49. A body weighs
    (a) the same in air and vacuum
    (b) less in the air than in vacuum
    (c) more in the air than in vacuum
    (d) none of the above

50. The wood which is used in railway sleepers is
    (a) Green heart wood   (b) Mahogany
    (c) Mahallic wood   (d) Jarrah and barri

51. A piece of rock was brought from moon to earth. Then
    (a) both masses as well as weight changed
    (b) its weight alone changed
    (c) its mass alone changed
    (d) none of the above

52. Light energy is converted into chemical energy by
    (a) transpiration   (b) respiration
    (c) electrolysis   (d) photosynthesis

53. Freshly laid eggs and stale eggs can be distinguished by
    (a) ultraviolet   (b) phosphorescence
    (c) fluorescence   (d) X-rays

54. When a body is stationary
    (a) various forces acting on it balance each other.

Top of first column:
(a) Volume will decrease till the temperature of water reaches 4°C and then it will increase
(b) Volume will increase till the temperature of water reaches 4°C and then it will decrease
(c) Volume will remain unchanged
(d) Volume will go on decreasing from beginning to the end

(b) forces are reflected off it

(c) there is no force acting upon it

(d) it has to be in vacuum

55. Oil rises up the wick in a lamp. The principle involves

(a) capillary action phenomenon

(b) volatility of oil

(c) the liquid state of oil

(d) the diffusion of oil through the wick

56. Railway tracks are banked on curves so that

(a) the train may not fly off in the opposite direction

(b) necessary centripetal force may be obtained from the horizontal component of the weight of the train

(c) to avoid frictional force between tracks and wheels

(d) necessary centrifugal force may be obtained from the horizontal component of the weight of the train

57. A skid mark in a hit and run accident primarily helps in determining the

(a) weight of vehicle

(b) speed of vehicle

(c) acceleration of velocity

(d) none of the above

58. The apparent weight of a man in a lift is less than his real weight

(a) when the lift is stationary

(b) when the lift is going up with uniform acceleration

(c) when the lift is going down with uniform acceleration

(d) none of the above

59. The law involved in cleaning a carpet by beating it with a stick

(a) first law of motion

(b) second law of motion

(c) law of conservation energy

(d) law of conservation of mass

60. A cricketer lowers his hand while catching the ball and this saves him from injury because of

(a) conservation of momentum

(b) conservation of mass

(c) Newton's third law of motion

(d) none of the above

61. A ball bounces higher at high altitudes than on plains because

(a) the air is more pure at higher altitudes

(b) the rarefied pull due to gravity is less at higher altitudes

(c) the pressure at higher altitudes is higher than that on plains

(d) downward pull due to gravity is less at higher altitudes

62. The most elastic matter is

(a) Rubber   (b) Silver

(c) Steel   (d) Glass

63. Siphoning out water does not work where water has got in through hole in a boat because

(a) it is a troublesome process

(b) the water level in the boat and outside it is the same

(c) the boat is in an unstable condition

(d) none of the above

64. If the velocity of a moving velocity is halved its kinetic energy, then velocity becomes

(a) one-fourth   (b) half

(c) double   (d) four times

65. A horse pulling a cart moves forward due to the force exerted by

(a) the ground on the horse's feet

(b) the horse on the ground with his feet

(c) the horse on the cart

(d) the cart on the horse

66. When a ship enters a sea from a river its level

(a) rises   (b) falls

(c) remains same   (d) none of the above

67. Carbon monoxide is carried around a closed cy abc, in which bc is an isothermal process
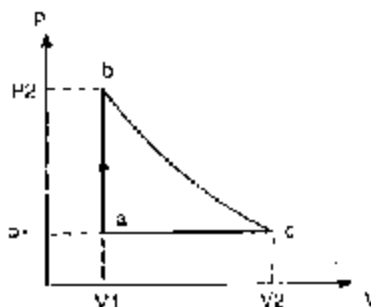
shown in the figure. The gas absorbs 7000 J of heat as its temperature increases from 300 K to 1000 K, in giving from a to b. The quantity of the heat rejected by the gas during the process ca is

(a) 9.0×10^3 J
(b) 1.8×10^3 J
(c) 3.6×10^3 J
(d) 5.0×10^3 J

68. A cycle tyre burst suddenly. This represents
   (a) isochoric process (b) adiabatic process
   (c) isobaric process   (d) isothermal process

69. The instrument periscope is most useful in
   (a) submarine   (b) ship
   (c) aircraft   (d) spacecraft

70. Which one of the following is a physical change
   (a) Digestion of food
   (b) Burning of cooking gas
   (c) Dissolving sugar in water
   (d) Souring of milk

71. In a U-tube experiment, a column AB of water is balanced by a column CD of paraffin. The relative density of paraffin is
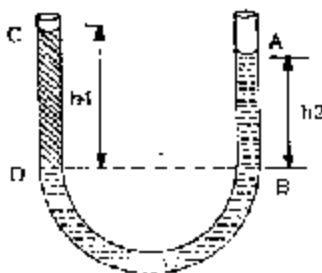

(a) $\dfrac{h_1}{h_2}$
(b) $\dfrac{h_2}{h_1}$

(c) $\dfrac{h_2 + h_1}{h_1}$
(d) $\dfrac{h_1}{h_1 + h_2}$

72. Water stored in unglazed earthen pots is cooled because
   (a) earthenware can absorb heat from the water
   (b) the pores allow the water to ooze out and evaporate
   (c) earthenware has low specific heat
   (d) the pores in the pot allow cool air to pass in

73. The good conductor of heat and electricity is
   (a) graphite   (b) granite
   (c) anthracite (d) diamond

74. In a cinematic camera, the opening of the shutter is mechanically synchronised with the passage of film through the camera so that at normal speed there is an exposure of
   (a) 16-20 frame every second
   (b) 16-24 frame every second
   (c) 16-30 frame every second
   (d) 20-35 frame every second

75. The total internal reflection occurs when
   (a) the angle of incidence is lower than the critical angle
   (b) the angle of incidence is greater than the critical angle
   (c) the angle of incidence is equal to the critical angle
   (d) none of the above

76. The principle of Dynamo was discovered by
   (a) Max Planck   (b) Albert Einstein
   (c) Michael Faraday (d) Newton

77. A synchronous orbit round the earth for any artificial satellite requires an orbital velocity of
   (a) $\dfrac{11.2}{\sqrt{2}}$ km/sec
   (b) $11.2\sqrt{2}$ km/sec
   (c) 3.42 km/sec
   (d) none of the above

78. Which one of the following graphs between velocity versus time for a body falling in a viscous fluid is correct ?
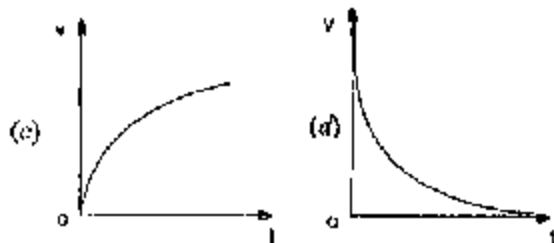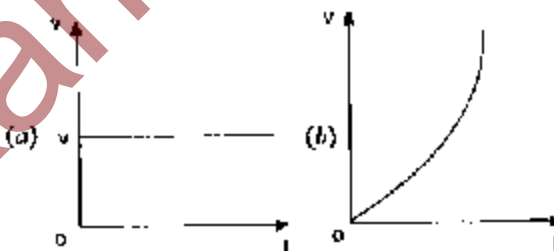
79. In Bohr's theory, the radius (r) of stationary orbits is proportional to
    (a) n^{-1}
    (b) n^{1}
    (c) n^2
    (d) n
    where n denotes the Principle Quantum Number.

80. If r is the ratio of the specific heat capacities of a gas of density d and pressure P, then the velocity of sound in it is
    (a) $\sqrt{\dfrac{Pr}{d}}$
    (b) $\sqrt{\dfrac{d}{P}}$
    (c) $\sqrt{\dfrac{rd}{P}}$
    (d) $\sqrt{\dfrac{P}{rd}}$

81. A vessel of depth d is half filled with a liquid of reflective index μ_1 and the other half is filled with a liquid of refractive index μ_2. The apparent depth of the vessel when looked at normally, is
    (a) $\dfrac{d}{2}\left[\dfrac{1}{\mu_1}+\dfrac{1}{\mu_2}\right]$
    (b) $\dfrac{d}{2}(\mu_1+\mu_2)$
    (c) $d\left[\dfrac{1}{\mu_1}+\dfrac{1}{\mu_2}\right]$
    (d) $d(\mu_1+\mu_2)$

82. Lightning follows a zig-zag path because
    (a) it is an optical illusion
    (b) the lightning discharge follows the path which offers least resistance
    (c) the positive change is repelled by the negative change of electricity and follows a zig-zag path
    (d) none of the above

83. Fuses are connected to the live wire in
    (a) parallel
    (b) series
    (c) both ways
    (d) none of the above

84. A tape recorder's tape is coated with a
    (a) ferromagnetic substance powder
    (b) paramagnetic substance powder
    (c) diamagnetic substance powder
    (d) none of the above

85. The mirror used for head light is
    (a) spherical concave
    (b) parabolic concave
    (c) cylindrical
    (d) plane

86. Why is a fluorescent lamp more efficient than an incandescent lamp?
    (a) It is less expensive to operate
    (b) The ultraviolet rays are turned into useful light
    (c) it lasts longer than an incandescent lamp
    (d) it is cheaper than an incandescent lamp

87. Humidity of the air
    (a) does not show any consistent behaviour with the change in atmospheric temperature
    (b) is not affected by the change in atmospheric temperature
    (c) decreases with the increase in atmospheric temperature
    (d) increases with the increase in atmospheric temperature

88. In an electric kettle water becomes hot by
    (a) convection
    (b) moving particle
    (c) radiation
    (d) conduction

89. In a barometer mercury is used instead of water because it
    (a) is not transparent
    (b) is a metal
    (c) has high density
    (d) is a good conductor of electricity

90. As the speed of the air flowing over an aeroplane wing increases, the pressure above the wing will
    (a) increase
    (b) remain the same
    (c) decrease
    (d) become the same as below it

91. The end of a knife is made pointed to have
    (a) less pressure
    (b) more pressure
   (c) no question of pressure
    (d) none of the above

92. A convex lens is immersed in a liquid of refractive index greater than that of glass. It will behave as a
    (a) divergent lens
    (b) convergent lens
    (c) plane glass
    (d) none of the above

93. A long glass tube is held vertically in water. A tunning fork is struck and held over the tube. Strong resonances are observed at two successive lengths 0.50 m and 0.54 m above the surface of water. If the velocity of sound is 340 m/sec, then the frequency of the tunning fork is
    (a) 400 Hz
   (b) 450 Hz
    (c) 475 Hz
    (d) 500 Hz

94. The force between two charges 0.06 m apart is 5 N. If each charge is moved towards the other by 0.01 m, then the force between them will become
(a) 5.75 N (b) 6.25 N
(c) 7.00 N (d) 7.20 N

95. A low-loss transformer has 230 volts applied to the primary and gives 4.6 volts in the secondary. Secondary is connected to a load which draws 5 amperes of current. The current (in amperes) in the primary is
(a) 0.05 amp (b) 0.1 amp
(c) 1.0 amp (d) 10 amp

96. In the half-wave rectifier circuit shown which one of the following waveforms is true for V_{CD} the output across C and D?

(a)

(b)

(c)

(d)
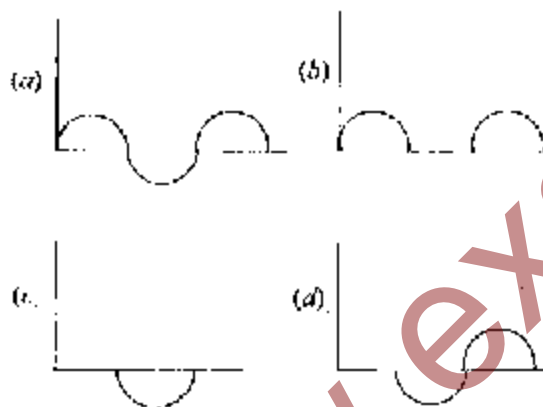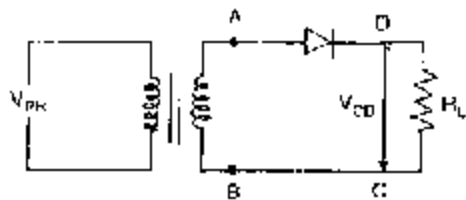
97. A body of mass 100 kg is dropped to the ground from a height of 10 m. The work done by the gravitational force is
(a) 98 Joules (b) 980 Joules
(c) 9800 Joules (d) 0

98. Consider the following statements
Assertion (A) : The internal energy of an ideal gas does not change during an isothermal process

Reason (R) : The decrease in volume of a gas is compensated by a corresponding increase in pressure when its temperature is held constant
(a) both A and R are true and R is the correct explanation of A
(b) both A and R are true but R is not correct explanation of A
(c) A is true but R is false
(d) A is false but R is true

99. Some heat is generated in a uniform metallic wire when a constant electric potential difference is applied to its ends. The rate of heat energy generated is doubled, if
(a) the length of the wire is doubled
(b) the radius of the wire is doubled
(c) both length and radius of the wire are halved
(d) both length and radius of the wire are doubled

100. The magnetic field at the centre due to motion of electron in first Bohr orbit is B. The magnetic field due to motion of electron in second Bohr orbit at the centre will be
(a) B/8 (b) B/16
(c) B/32 (d) B/64

101. When light of wavelength greater than 600 Å is incident on a metal, an electron is emitted. The approximate work function of metal is
(a) 2 eV (b) 4 eV
(c) 6 eV (d) 8 eV

102. In the circuit given below $R_1 > R_2$. In which resistor the power dissipated is greater
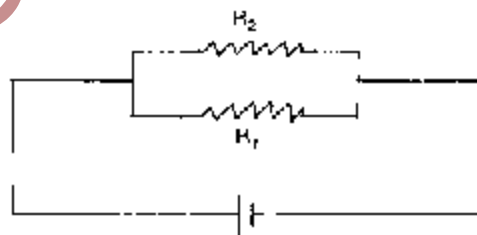
(a) in R_1 (b) in R_2
(c) equal in both (d) none of the above

103. A wire is stretched so that its diameter is reduced to one-third. The ratio of final resistance of wire to original resistance would be
(a) 1 : 3 (b) 1 : 9
(c) 9 : 1 (d) 81 : 1

104. Ampere-sec is a unit of
    (a) strength of current
    (b) quantity of electricity
    (c) power
    (d) energy

105. When viewed in green light a flag that is red green will appear to be
    (a) black and white
    (b) white and yellow
    (c) black and green
   (d) green and yellow

106. At the neutral point
    (a) the bar magnet is always perpendicular to the earth's magnetic field
    (b) the magnetic field of the bar magnet is equal and opposite to that of the earth
    (c) the magnetic field of the bar magnet is zero
    (d) the magnetic field of the bar magnet due to earth is zero

107. A person can see the objects only at distance greater than 40 cm. He is advised to use lens of power
    (a) – 2.5 D   (b) – 1.5 D
    (c) + 2.5 D   (d) – 1.5 D

108. Sound waves in air do not show the phenomenon of
    (a) polarisation   (b) diffraction
    (c) refraction   (d) interference

109. The unit of thermal conductivity is
    (a) $Jm^{-1}s^{-1}{}^\circ C^{-1}$ (b) $J-m-s^{\circ}C^{-1}$
    (c) J-s   (d) $Jm^{-1}s^{-1}{}^\circ C^{-2}$

110. An infinite sequence of resistance is shown in the following figure. The resultant resistance between A and B will be
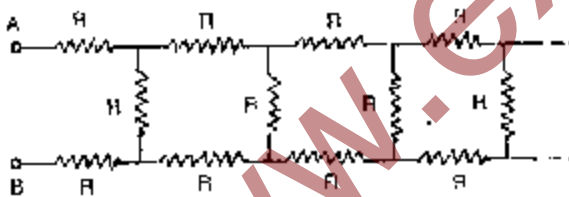
    (a) R ohm   (b) $2R$ ohm
    (c) $3R$ ohm   (d) infinity

111. Same current is flowing in two alternating circuits. The first circuit contains only inductance and the other contains only a capacitor. If the frequency of the e.m.f. is increased, the effect on the value of the current will be
    (a) decrease in first circuit and increase in the other
    (b) decrease in both circuits
    (c) increase in both circuits
    (d) increase in first circuit and decrease in the other

112. A monkey sits on the pan of a spring scale kept in an elevator. The reading of the spring scale will be maximum, when
    (a) the elevator is stationary
    (b) the elevator accelerates upwards
    (c) the elevator accelerates downwards
    (d) the elevator cable breaks and it falls freely towards earth

113. The work done in spraying a large drop of radius R into 8 smaller drops each of radius r is
    (a) $4\pi R^2 T$ (b) $\frac{3}{4}\pi R^2 T$
    (c) $\frac{3\pi R^2 T}{2}$ (d) $3\pi R^2 T$

114. A sphere is released from the window of an aeroplane moving horizontally. The path of the sphere will be
    (a) straight line   (b) circle
    (c) parabolic   (d) spiral

115. Cyclotron is used to
    (a) accelerate positively and negatively charged particles both
    (b) accelerate negatively charged particle only
    (c) accelerate positively charged particle only
    (d) accelerate neutrons

116. Pyrometer is used to measure
    (a) high pressure   (b) low pressure
    (c) high temperature (d) low temperature

117. The inductance of a coil is
    (a) proportional to the square of the number of turns
    (b) proportional to the number of turns
    (c) proportional to the resistance of the coil
    (d) proportional to its length

118. If μ is the amplification factor g_m is mutual conductance and r_p the plate resistance of a triode. Which of the following is correct ?
    (a) $\mu = r_p \times g_m$ (b) $\mu \times r_p = g_m$

(c) $g_m = r_\mu \times \mu$ (d) $r_i = \mu \times g_m$

119. In photoelectric emission, the number of electrons ejected per second
   (a) is proportional to the work function of the material
   (b) is proportional to the frequency of light
   (c) is proportional to the wavelength of light
   (d) is proportional to the intensity of light

120. The three axes of a crystal lattic are mutually perpendicular and two of the lattic parameters are equal. The crystal system is
   (a) trigonal   (b) tetragonal
   (c) hexagonal   (d) pentagonal

121. The velocity of change carriers of current (about 1 amp) in a metal under normal condition is of the order of
   (a) a few hundred meters/second
   (b) several thousand meters/second
   (c) a fraction of mm per second
   (d) velocity of light

122. Three semi-conductors are arranged in the increasing order of their energy gap as follows. The correct arrangement is
   (a) silicon, tellurium, germanium
   (b) silicon, germanium, tellurium
   (c) tellurium, silicon, germanium
   (d) tellurium, germanium, silicon

123. The half-life of radium is 1620 years and its atomic weight is 226 kgm per kilo mol. The number of atoms that will decay from its 1 gm sample per second will be
   (a) 3.61×10^{10} (b) 3.61×10^{13}
   (b) 3.61×10^{12} (d) 3.61×10^{9}

124. A non-conducting partition divides a container into two equal compartments. One is filled with helium gas at 200 K and the other is filled with oxygen gas at 400 K. The number of molecules in each gas is the same. If the partition is removed to allow the gases to mix, the final temperature will be
   (a) 1350 K   (b) 1325 K
   (c) 300 K   (d) 1275 K

125. The kinetic theory of gases breaks down most at
   (a) high pressure and low temperature
   (b) low pressure and low temperature

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

126. A solid sphere of uniform density and radius R applies a gravitational force of attraction equal to F_1 on a particle placed at A, distance $2R$ from the centre of sphere. A spherical cavity of radius $R/2$ is now made in the sphere as shown in the figure. The sphere with cavity now applies a gravitational force F_2 on the same particles placed at A. The ratio F_2/F_1 will be


(a) $\dfrac{1}{2}$ (b) $\dfrac{3}{2}$
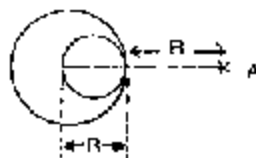
(c) $\dfrac{5}{2}$ (d) $\dfrac{7}{2}$

127. If two waves of same frequency and same amplitude respectively on super-imposition produce a resultant wave of the same amplitude, the waves differ in phase by
   (a) zero   (b) $\pi/4$
   (c) $2\pi/3$ (d) $2\pi/5$

128. A solid sphere of mass M and radius R rolls on a horizontal surface without slipping. The ratio of rotational K.E. to total K.E. is
   (a) 7 : 10   (b) 1 : 2
   (c) 2 : 7   (d) 3 : 8

129. Match the following statements given below

Column A	Column B
(A) Mirrors	(i) Dispersion
(B) Lenses	(ii) Reflection
(C) Mirage	(iii) Refraction
(D) Colour of thin film	(iv) total internal reflection
(E) Direct vision spectroscope	(v) Interference

   (a) (A-ii), (B-i), (C-iv), (D-v), (E-iii)
   (b) (A-ii), (B-iii), (C-iv), (D-v), (E-i)

(c) (A-iii), (B-ii), (C-iv), (D-i), (E-v)

(d) (A-iv), (B-iii), (C-v), (D-ii), (E-i)

130. The Fraunhoffer's lines observed in spectrum of white light can be explained by
 (a) Newton's Law   (b) Bohr's Law
 (c) Kirchoff's Law   (d) Fraunhoffer's Law

131. Two prisms are combined to get the spectrum along the direction of incident ray by
 (a) deviations without dispersion
 (b) dispersion without deviation
 (c) achromatic combination prisms
 (d) non-achromatic combination prisms

132. Two thin lenses of focal length f_1 and f_2 are in contact. The focal length of combination is
 (a) $\dfrac{f_1 \cdot f_2}{2}$ (b) $\dfrac{f_1 f_2}{f_1 + f_2}$
 (c) $\dfrac{f_1 \cdot f_2}{f_1 - f_2}$ (d) $\dfrac{f_1 + f_2}{2}$

133. When a refraction takes place at the surface of a rarer medium, the change in angle and path difference in case of reflected ray are relatively
 (a) $0, \dfrac{\lambda}{2}$ (b) $\pi, \dfrac{\lambda}{2}$
 (c) $\dfrac{3\pi}{2}, \dfrac{\lambda}{2}$ (d) $2\pi, \lambda$

134. The linear magnification of an image is m. The magnification for area will be
 (a) $\sqrt{m}$ (b) m
 (c) m^2 (d) m^4

135. Mean free path is defined as the
 (a) distance between two molecules
 (b) distance between two molecular collisions
 (c) average distance between two molecules
 (d) average distance between two molecular collisions

136. The kinetic energy of the molecules of any gas at $t°C$ is proportional to
 (a) $t + 273$ (b) $\dfrac{1}{t + 273}$
 (c) $\sqrt{t + 273}$ (d) $\sqrt{t}$

137. Most of the processes in nature are
 (a) irreversible

(b) reversible

(c) depends on varying conditions

(d) unnatural

138. Solar constant is defined as the
 (a) distance of sun from earth
 (b) average amount of sun's energy falling on 1 m² of earth placed at right angles to the sun's rays per minute
 (c) average amount of heat energy emitted by sun in one minute
 (d) average diameter of the sun

139. Ice formed over lakes has
 (a) good convection properties
 (b) good radiation properties
 (c) very low thermal conductivity and retards further formation of ice
 (d) very high thermal conductivity and helps in further formation of ice

140. What extinguishes a fire quicker?
 (a) Boiling water
 (b) Cold water
 (c) Both are equally effective
 (d) None of the above

141. Young's Modulus is defined as
 (a) ratio of normal stress to linear strain
 (b) ratio of linear strain to normal stress
 (c) square root of the ratio between normal stress and linear strain
 (d) product of linear strain and normal stress

142. Two objects A and B float in water. It is observed that A floats with half its volume submerged and B floats with one-third of its volume out of the water surface. The densities of A and B are in the ratio
 (a) 1 : 3   (b) 2 : 3
 (c) 3 : 4   (d) 4 : 5

143. When the adhesive force between a liquid and a glass is greater than the cohesive forces between the liquid molecules, the meniscus of liquid in a capillary tube is
 (a) concave in shape   (b) convex in shape
 (c) flat   (d) pyramidical

144. The light roofs of straw are flown off during a certain wind strom because
 (a) high wind blowing over the roofs creates a low pressure on the top

(b) roots are not tightly tied

(c) roofs have typical shape

(d) wind blowing creates high pressure

145. In the steady flow at any point at any instant, all the particles have

(a) constant speed

(b) constant velocity

(c) constant acceleration

(d) none of the above

146. A motor bike and a car moving with the same kinetic energy are brought to rest by the application of brakes which provide equal retarding forces. Which of the two will come to rest in shorter distance?

(a) motor bike

(b) car

(c) the distance travelled will depend on power of vehicle

(d) both will travel equal distance before coming to rest

147. For torsional oscillations the period of oscillation is

(a) directly proportional to moment of inertia about the axis of rotation

(b) inversely proportional to square root of moment of inertia about axis of rotation

(c) directly proportional to square root of moment of inertia about axis of rotation

(d) inversely proportional to moment of inertia about the axis of rotation

148. A body is moving with a constant speed V in a circle of radius R. Its angular acceleration is

(a) VR (b) V/R

(c) V/R^2 (d) 0

149. An ornament is suspected to be hollow. Its weight is 210 gram and it can displace 22 cubic centimeter of water. If the specific gravity of silver is 10.5, the volume of the cavity is

(a) 2 cc   (b) 4 cc

(c) 20 cc   (d) 0

150. A particle executing simple harmonic motion with amplitude 'a', will have its potential energy equal to its kinetic energy at displacement y equal to

(a) $\sqrt{2}y = a$ (b) $y = \sqrt{2}a$

(c) $y = 2a$ (d) $2ya$

151. A hollow sphere is filled with water through a small hole in it. It is suspended by a long thread. Water slowly flows out of the hole at the bottom. Then which one of the following is correct?

(a) The period will first increase then it will decrease till the sphere is empty

(b) The period will not be affected at all

(c) The period will decrease

(d) The period will go on increasing till the sphere is empty

152. An aircraft explodes into three parts. The quantity that is concerned is

(a) kinetic energy

(b) momentum only

(c) both momentum and kinetic energy

(d) none of the above

153. The velocity of body (in the figure shown) as it moves from C to D is
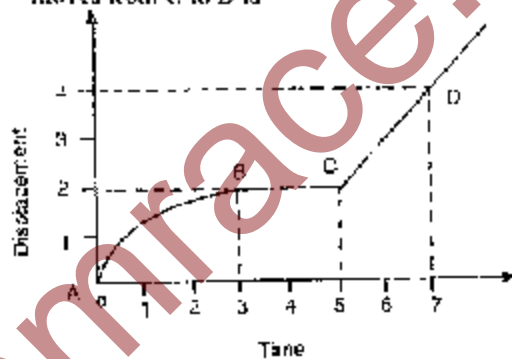
(a) 0 m/sec   (b) 1 m/sec

(c) 2 m/sec   (d) 2 m/sec

154. Two particles of equal mass rest on the pans of an equal arm balance in a lift accelerates upwards?

(a) Yes

(b) No

(c) the left hand pan will go down

(d) the right hand pan will go upwards

155. A stone of mass 2 kg covers in successive seconds the distance of 8, 9, 10 meters respectively. The force acting on it is

(a) 4 N   (b) 6 N

(c) 2 N   (d) 8 N

156. When the acceleration and velocity are acting perpendicular to each other then the trajectory of motion is

(a) straight   (b) circular

(c) parabolic (d) none of the above

157. One giga volt is equal to
(a) 1.0×10^6 volt (b) 1.0×10^7 volt
(c) 1.0×10^{11} volt (d) 1.0×10^9 volt

158. The numerical value associated with a physical quantity is
(a) inversely proportional to the unit selected
(b) directly proportional to the unit selected
(c) indepent of the unit selected
(d) none of the above

159. The magnitude of the sum of two vectors $3\hat{i} + 4\hat{j}$ and $5\hat{j} + 6\hat{k}$ is
(a) $4\sqrt{6}$ (b) $6\sqrt{5}$
(c) $12\sqrt{2}$ (d) $6\sqrt{3}$

160. To make longest possible throw, the cricketer is advised to make an angle of
(a) 60° (b) 45°
(c) 35° (d) 0°

161. A simple pendulum is set up inside a trolley which moves down a plane inclined to the horizontal in a frictionless manner. In the equilibrium position, the string of the pendulum
(a) will remain parallel to the plane
(b) will remain vertical
(c) will remain perpendicular to the inclined plane
(d) none of these

162. A man stands on a platform spring balance placed on the floor of a stationary lift and the reading of the balance is 100 kg. If the lift suddenly falls freely under gravity, the reading on this spring balance will be
(a) 100 kg (b) 980 kg
(c) 10 kg (d) 0

163. A body of mass 10 kg is rotated in a circle of radius 5 m with a uniform speed of 5 m/sec. The force which must act on the body to maintain the motion is
(a) 125 N (b) 1250 N
(c) 250 N (d) 1205 N

164. When a mass is rotating in a plane about fixed point its angular momentum is directed along
(a) the axis of rotation
(b) the radius

(c) the tangent to the orbit
(d) line at an angle of 45° to the plane of rotation

165. Water is flowing in a pipe of uniform cross-section under constant pressure. At some place the pipe becomes wider. The pressure of water at this place
(a) increases (b) decreases
(c) remains same (d) none of the above

166. When a capillary is dipped in water then water rises to height h and if the length of the capillary is made less than h, then
(a) the water will not rise
(b) the water will come out
(c) the water will not come out
(d) none of these

167. The expansion of material when heated is because
(a) heat is imparted to the material
(b) temperature is more
(c) the frequency of vibrations increases
(d) the average distance between atoms increases

168. The pressure P of a gas and its mean kinetic energy E per unit volume are related as
(a) $P = K.E.$ (b) $P = \frac{1}{2} K.E.$
(c) $P = \frac{2}{3} K.E.$ (d) $P = \frac{3}{2} K.E.$

169. The image coincides in the case of concave mirror with the object when the object is placed at
(a) focus
(b) infinity
(c) centre of curvature
(d) half the focal length away from the mirror

170. The critical angle of light passing from glass to air is minimum for
(a) blue (b) red
(c) violet (d) green

171. A convex mirror of focal length f produces an image $\frac{1}{n}$th of the size of object. The distance of the object from the mirror is
(a) $(n-1)f$ (b) $(n+1)f$

(c) $\left(\dfrac{n+1}{n-1}\right)f$ (d) $\left(\dfrac{n-1}{n+1}\right)f$

172. The wave front due to a slit in a homogenous, medium is

(a) plane   (b) circular

(c) clyindrical   (d) spherical

173. Colour of the sky is blue due to

(a) scattering of light

(b) total internal reflection

(c) total emission

(d) it is not possible

174. If we want to change a galvanometer into ammeter, extra resistance required is

(a) low resistance in parallel

(b) high resistance in parallel

(c) low resistance in series

(d) high resistance in series

175. Light waves projected on oil surface shows 7 colours due to

(a) Polarisation   (b) Diffraction

(c) Refraction   (d) Interference

175. Match the following statements. In this section you have to match the correct pair given in column A and column B.

Column A	Column B
(A) Vernier Calliper	(i) law of motion
(B) Moment of inertia	(ii) F × d
(C) Kinetic energy	(iii) unit of solid angle
(D) Newton	(iv) kg-m²
(E) Steradian	(v) measure of length

(a) (A-v), (B-ii), (C-iii), (D-i), (E-iv)

(b) (A-v), (B-ii), (C-iv), (D-i), (E-iii)

(c) (A-iii), (B-ii), (C-iv), (D-i), (E-v)

(d) (A-iii), (B-i), (C-v), (D-ii), (E-iv)

177.

Column A	Column B
(A) hydrometer	(i) N/m²
(B) weight	(ii) fluid motion
(C) potential energy	(iii) measure density of liquid

(D) Bernoulli   (iv) mgh

(E) Pascal   (v) Newton

(a) (A-iii), (B-v), (C-iv), (D-ii), (E-i)

(b) (A-ii), (B-iv), (C-ii), (D-i), (E-iii)

(c) (A-iii), (B-iv), (C-v), (D-i), (E-ii)

(d) (A-ii), (B-iv), (C-iii), (D-i), (E-ii)

178.

Column A	Column B
(A) speedometer	(i) measure speed of vehicles
(B) viscosity	(ii) planetary motion
(C) Work done	(iii) poise
(D) kepler	(iv) 10⁻⁶m
(E) onicron	(v) F × t

(a) (A-ii), (B-iv), (C-v), (D-iii), (E-i)

(b) (A-iii), (B-iv), (C-v), (D-ii), (E-i)

(c) (A-i), (B-iii), (C-v), (D-iv), (E-ii)

(d) (A-i), (B-iii), (C-v), (D-iv), (E-ii)

179.

Column A	Column B
(A) barometer	(i) N/m
(B) surface tension	(ii) Law of conservation of momentum
(C) momentum	(iii) measure of atmospheric pressure
(D) explosive	(iv) mV

(a) (A-ii), (B-iii), (C-iv), (D-i), (E-v)

(b) (A-ii), (B-iii), (C-v), (D-i), (E-iv)

(c) (A-iv), (B-ii), (C-v), (D-i), (E-iii)

(d) (A-iii), (B-i), (C-iv), (D-ii), (E-v)

180.

Column A	Column B
(A) Horse power	(i) relative density
(B) Archimedies	(ii) F × t
(C) impulse	(iii) measure altitude
(D) modulus of elascity	(iv) 746 watt
(E) altimeter	(v) N/m²

(a) (A-ii), (B-iii), (C-iv), (D-v), (E-i)

(b) (A-iii), (B-ii), (C-v), (D-iv), (E-i)

(c) (A-iv), (B-i), (C-ii), (D-v), (E-iii)

(d) (A-iv), (B-i), (C-iii), (D-v), (E-ii)

Answers

1	2	3	4	5	6	7	8	9	10
(c)	(d)	(a)	(c)	(a)	(a)	(a)	(c)	(a)	(d)
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
(b)	(a)	(a)	(d)	(c)	(a)	(a)	(b)	(b)	(c)

21	22	23	24	25	26	27	28	29	30
(b)	(a)	(b)	(c)	(a)	(a)	(c)	(b)	(d)	(b)
31	32	33	34	35	36	37	38	39	40
(b)	(c)	(b)	(c)	(c)	(a)	(a)	(b)	(d)	(b)
41	42	43	44	45	46	47	48	49	50
(a)	(d)	(c)	(c)	(b)	(c)	(a)	(c)	(b)	(d)
51	52	53	54	55	56	57	58	59	60
(c)	(d)	(c)	(a)	(a)	(d)	(b)	(c)	(a)	(a)
61	62	63	64	65	66	67	68	69	70
(d)	(c)	(b)	(a)	(a)	(a)	(a)	(b)	(a)	(c)
71	72	73	74	75	76	77	78	79	80
(b)	(b)	(a)	(b)	(b)	(c)	(a)	(c)	(c)	(c)
81	82	83	84	85	86	87	88	89	90
(a)	(b)	(b)	(a)	(b)	(b)	(d)	(c)	(c)	(b)
91	92	93	94	95	96	97	98	99	100
(b)	(a)	(d)	(d)	(b)	(b)	(c)	(a)	(d)	(a)
101	102	103	104	105	106	107	108	109	110
(a)	(c)	(d)	(b)	(c)	(b)	(d)	(a)	(b)	(b)
111	112	113	114	115	116	117	118	119	120
(a)	(d)	(a)	(c)	(a)	(c)	(a)	(a)	(d)	(b)
121	122	123	124	125	126	127	128	129	130
(c)	(d)	(c)	(c)	(a)	(a)	(c)	(c)	(b)	(c)
131	132	133	134	135	136	137	138	139	140
(b)	(b)	(b)	(c)	(d)	(a)	(a)	(b)	(c)	(a)
141	142	143	144	145	146	147	148	149	150
(d)	(c)	(a)	(d)	(b)	(d)	(a)	(d)	(a)	(a)
151	152	153	154	155	156	157	158	159	160
(a)	(b)	(b)	(a)	(c)	(b)	(a)	(a)	(d)	(b)
161	162	163	164	165	166	167	168	169	170
(c)	(d)	(c)	(a)	(b)	(c)	(d)	(c)	(c)	(c)
171	172	173	174	175	176	177	178	179	180
(a)	(a)	(a)	(a)	(d)	(b)	(a)	(c)	(d)	(c)