PHYSICS 06

1. Mechanics

1. Number of basic SI unit is :
(a) 4 (b) 7 (c) 6 (d) 5

2. Which of the following is not the unit of energy :
(a) Calorie (b) Joule
(c) Electron volt (d) Watt

3. Light year is unit of :
(a) time (b) speed of light
(c) distance (d) mass
[RRB Bhopal TC 2005]

4. Which of the following is not the unit of time :
(a) Parallactic second (b) Micro second
(c) Leap year (d) Solar day

5. One fermimetre is equal to :
(a) 10^{-9} m (b) 10^{-15} m
(c) 10^{-18} m (d) 10^{-12} m

6. SI unit of luminious intensity is :
(a) lumen (b) lux
(c) candela (d) watt

7. Parasec is the unit of :
(a) distance (b) time
(c) intensity of light (d) magnetic line
[UP PCS 1997]

8. One light year is approximately equal to :
(a) 10^{11} km (b) 10^{15} m
(c) 10^{16} m (d) 10^{16} km
[SSC Mat. 2000, 2002]

9. Match List-I (Quantity) with List-II (units) and select the correct answer using the codes given below the lists :

List-I	List-II
A. High speed	1. Mach
B. Wave length	2. Angstrom
C. Pressure	3. Pascal
D. Energy	4. Joule

Code :	A	B	C	D
(a)	2	1	4	3
(b)	2	1	3	4
(c)	1	2	4	3
(d)	1	2	3	4

[IAS 1999]

10. Match List-I with List-II and select the correct answer from the code given below :

List-I	List-II
A. Jule	1. Current
B. Ampere	2. Power
C. Watt	3. Work
D. Volt	4. Potential difference
E. Calorie	5. Heat

Code :	A	B	C	D	E
(a)	3	1	2	4	5
(b)	1	2	3	4	5
(c)	4	3	2	1	5
(d)	1	3	2	4	5

[UP PCS 1990]

11. Match List-I with List-II and select the correct answer from the code given below :

List-I	List-II
A. Acceleration	1. Jule
B. Force	2. Newton second
C. Work done	3. Newton
D. Impulse	4. Metre per second^2

Code :	A	B	C	D
(a)	1	2	3	4
(b)	2	3	4	1
(c)	4	3	1	2
(d)	3	4	1	2

[UP PCS 2002, 2005]

12. Ampere is the unit of :
(a) current electricity (b) magnetic field
(c) electric charge (d) resistance
[RRB Kolkatta (ASM) 2005]

13. What is the SI unit of Young's modulus of elasticity :
(a) dyne/cm (b) newton/m
(c) newton/m^2 (d) m^2/s
[RRB Chennai TC 2005]

14. What is the SI unit of pressure :
(a) Pascal (b) Dyne
(c) Newton (d) Jule
[RRB Banglore ASM 2003]

15. Curie is the unit of :
(a) temperatsure (b) radio activity
(c) heat (d) energy

16. Decibel is the unit of :
(a) speed of light (b) intensity of sound
(c) intensity of heat (d) None of these
[SSC Graduate level 2005]

17. In the relation $\alpha = \beta t + \lambda$, α and λ are measured in metre (m) and t is measured in second (s). The SI unit of β must be :
(a) m (b) ms (c) s (d) ms^{-1}
[NDA 2009]

18. Temperature can be expressed as derived quantity in terms of any of the following :
(a) length and mass (b) mass and time
(c) length, mass and time (d) in terms of non

19. One astronomical unit is the average distance between :
(a) Earth and the Sun (b) Earth and the Moon
(c) Jupiter and the Sun (d) Pluto and the Sun
[IAS 1998]

20. Which of the following physical quantities have the same dimensions :
(a) Angular momentum and work
(b) Work and Torque
(c) Potential energy, linear momentum
(d) Kinetic energy, velocity

21. The most suitable unit for expressing nuclear radius is :
(a) micron (b) nanometre
(c) fermi (d) angstrom

22. Match List-I with List-II and select the correct answer using the codes given below :

List-I	List-II
A. Joule	1. Henery-ampere/sec
B. Watt	2. Farad-volt
C. Volt	3. Coulomb-volt
D. Coulomb	4. Orested-cm
	5. Amp-gauss
	6. Amp^2 - ohm

Code :	A	B	C	D
(a)	1	6	5	4
(b)	3	6	1	2
(c)	3	6	1	5
(d)	2	6	1	3

23. Which of the following physical quantities do not have same dimensions :
(a) Force and Pressure (b) Work and energy
(c) Impulse and momentum (d) Weight and Force

24. Which of the following physical quantities have the same dimensions ?
(a) momentum and impulse
(b) power and young's modulus
(c) energy and angular momentum
(d) force constant and moment of inertia

25. Which of the following physical quantity is dimensionless :
(a) angle (b) strain
(c) specific gravity (d) all of these

26. Erg × Sec is the unit of :
(a) Angular momentum (b) Linear momentum
(c) Planck's constant (d) Energy

27. Unit of resistance is :
(a) volt × ampere (b) $volt^2$ × ampere
(c) volt/ampere (d) ampere/volt

28. If the density of water is 1 g cm^{-3} in C.G.S system, its value in M.K.S system is :
(a) 1 kgm^{-3} (b) 10^3 kg m^{-3}
(c) 10^{-3} kgm^{-3} (d) 10^{-6} kg m^{-3}

29. Potential is measured in :
(a) Watt (b) Joule
(c) $\frac{\text{Joule}}{\text{Coulomb}}$ (d) Newton-second
[SSC Mat. 2000, 2002]

30. Maxwell is the unit of :
(a) intensity of magnetization
(b) permeability
(c) magnetic flux
(d) magnetic susceptibility

31. S.I unit of magnetic flux is :
(a) Weber-m^2 (b) Weber
(c) $\frac{\text{Weber}}{\text{m}}$ (d) $\frac{\text{Weber}}{\text{m}^2}$

32. Unit of solid angle is :
(a) degree (b) radian
(c) steradian (d) radian-second

33. Which one of the following groups have quantities that do not have the same dimensions ?
(a) pressure, stress (b) velocity, speed
(c) force, impulse (d) work, energy

34. S.I. unit of surface tension is :
(a) $\frac{\text{N}}{\text{m}^2}$ (b) $\frac{\text{N}}{\text{m}}$ (Nm^{-1})
(c) $\frac{\text{Ns}}{\text{m}}$ (d) $\frac{\text{J}}{\text{s}}$

35. The SI unit of angular momentum is :
(a) Kgm^2s^{-1} (b) Kgm^2s^{-2}
(c) $Kgms^{-2}$ (d) $Kgms^{-1}$

36. Which of the following is a scalar quantity ?
(a) Displacement (b) Electric field
(c) Acceleration (d) Work

37. Pick out the only vector quantity :
(a) pressure (b) impulse
(c) gravitational potential
(d) co-efficient of friction

38. Pick out the only scalar quantity :
(a) power (b) electric field
(c) magnetic momentum (d) average velocity

39. Which of the following statements is false ?
(a) The magnitude of a vector is always a scalar.
(b) The total path length is always equal to the magnitude of the displacement vector of a particle.
(c) The average speed of a particle is either greater or equal to the magnitude of the average velocity of the particle over the same interval of time.
(d) Three vectors not lying in a plane can never add up to give a null vector.

40. Five equal forces of 10 N each are applied at one point and all are lying in one plane. If angles between them are equal, the resultant of these forces will be :
(a) Zero (b) 10 N (c) 20 N (d) 10 2 N

41. Which of the following is a scalar quantity ?
(a) electric current (b) electric field
(c) acceleration (d) linear momentum

42. Which of the following is not a vector quantity ?
(a) speed (b) velocity
(c) torque (d) displacement

43. Which of the following is a vector quantity ?
(a) Momentum (b) Pressure
(c) Energy (d) Work *[IAS 1997]*

44. Distance of stars are measured in :
(a) Galactic unit (b) Seller mile
(c) Cosmic kilometre (d) Light year

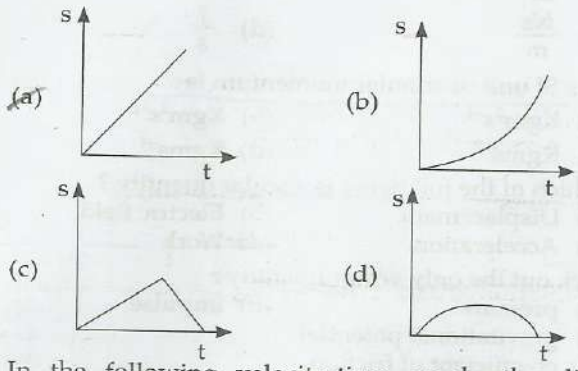
45. The minimum number of Non-zero non-collinear vectors required to produce a zero vector is :
(a) 3 (b) 2 (c) 4 (d) 1

46. Masses of stars and galaxies are usually expressed in terms of :
(a) neutron mass (b) earth's mass
(c) solar mass (d) lunar mass

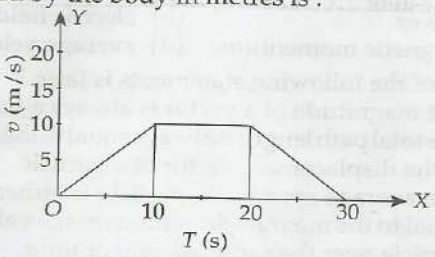
47. An object with a constant speed :
(a) is not accelerated (b) might be accelerated
(c) is always accelerated
(d) also has a constant velocity

48. When body is accelerated :
(a) its velocity never changes
(b) its speed always changes
(c) its direction always changes
(d) its speed may or may not change

49. Which of the following graphs represents the displacement (s) -time (t) graph for uniform motion ?

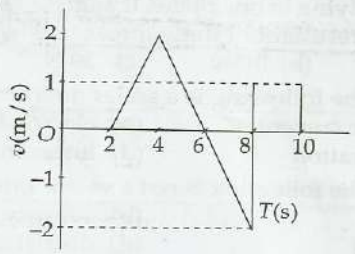


50. In the following velocity-time graph, the distance travelled by the body in metres is :



(a) 200 (b) 250 (c) 300 (d) 400

51. The velocity-time graph of body moving in a straight line is given below. The displacement of the body in 10 second is :



(a) 4 m (b) 6 m (c) 8 m (d) 10 m

52. A bus covers the first half of a certain distance with speed v_1 and the second half with a speed v_2. The average speed during the whole journey is :

(a) $\frac{v_1 + v_2}{2}$ (b) $\frac{v_1 v_2}{v_1 + v_2}$

(c) $\sqrt{v_1 v_2}$ (d) $\frac{2v_1 v_2}{v_1 + v_2}$

53. A bus travels for a certain time. Its speed during the first half time is v_1 and that during the second half time is v_2. The average speed during the whole journey is :

(a) $\sqrt{v_1 v_2}$ (b) $\frac{2v_1 v_2}{v_1 + v_2}$

(c) $\frac{v_1 + v_2}{2}$ (d) $\frac{2}{v_1 + v_2}$

54. A car goes straight from a point A to a point B with a velocity of 40 km/h and returns back with a velocity of 60 km/h. The average velocity during the whole journey is :

(a) 0 (b) 48 km/h
(c) 50 km/h (d) none

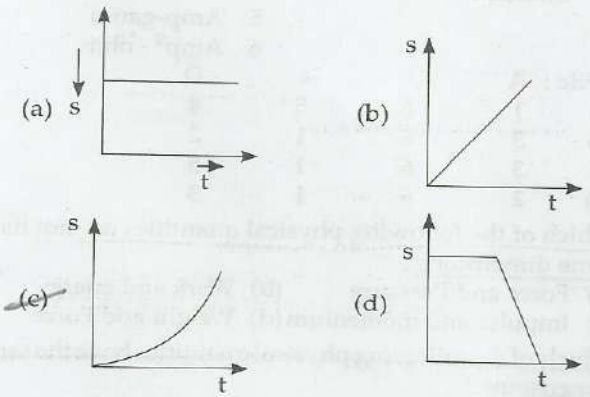
[SSC Mat. 2000, 2002]

55. When the milk is churned vigorously the cream from it is separated out due to—

(a) Frictional force (b) Centrifugal force
(c) Centripetal force (d) Gravitational force

[SSC (LDC) 2013]

56. Which of following graphs represents accelerated motion ?



57. A passenger in a moving train tosses a coin upward which falls behind him. It implies that the motion of the train is—

(a) accelerated (b) uniform
(c) retarded (d) along the circular tracks

[NDA 2014]

58. If the distance S covered by a moving car in rectilinear motion with a speed v in time t is given by $S = vt$, then the car undergoes

(a) a uniform acceleration
(b) a non-uniform acceleration
(c) a uniform velocity
(d) a non-uniform velocity *[NDA 2014]*

59. Definition of force comes from Newton's—

(a) first law of motion (b) second law of motion
(c) third law of motion (d) law of gravitation

[SSC (MTS) 2014]

60. The known forces of nature can be divided into four classes, viz. gravity, electromagnetism, weak nuclear force and strong nuclear force. With reference to them, which one of the following statements is ***not*** correct ?

(a) Gravity is the strongest of the four
(b) Electromagnetism acts only on particles with an electric charge
(c) Weak nuclear force causes radioactivity
(d) Strong nuclear force holds protons and neutrons inside the nucleus of an atom *[IAS 2013]*

61. Dirty cloths containing grease and oil stains are cleaned by adding detergents to water. Stains are removed because detergent :

(a) reduces drastically the surface tension between water and oil
(b) increases the surface tension between water and oil
(c) increase the viscosity of water and oil
(d) decreases the viscosity in detergent mixed water

[CDS 2013]

62. Acting on a non-rigid body, a force can—

(a) produce dimensional change
(b) produce change in direction of motion
(c) start motion (d) stop motion *[SSC 2013]*

63. Motion of an oscillating liquid column in a U-tube is :
(a) periodic but not simple harmonic
(b) non periodic
(c) simple harmonic and time period is independent of the density of the liquid
(d) simple harmonic and time period depends on the density of the liquid *[CDS 2013]*

64. A monkey sits on the pan of a spring scale kept in an elevator. The reading of the spring scale will be maximum when the elevator :
(a) is stationary (b) accelerates upward
(c) accelerates downwards
(d) it falls freely towards the earth

65. Consider the following statements :
Assertion (A) : A table cloth can be pulled from a table without dislodging the dishes.
Reason (R) : To every action there is an equal and opposite reaction of these statements.
Codes : -
(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 the correct explanation of A
(c) A is true but R is false (d) A is false but R is true

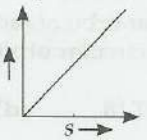
66. A ball is thrown vertically upwards. Assuming the air resistance to be constant and considerable :
(a) the time of ascent < the time of descent
(b) the time of ascent the time of descent
(c) the time of ascent = the time of descent
(d) the time of ascent > the time of descent

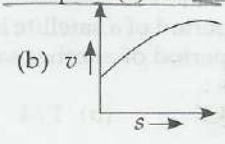
67. A person stands at the middle point of a wooden ladder which starts slipping between a vertical wall and the floor of the room, while continuing to remain in a vertical plane. The path traced by a person standing at the middle point of the slipping ladder is :
(a) straight line (b) a elliptical path
(c) a circular path (d) a parabolic path *[IAS 2004]*

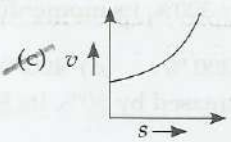
68. A man in a train moving with constant velocity drops a ball on the platform. The path of the ball as seen by an observer standing on the platform is :
(a) straight line (b) a circle
(c) a parabola (d) none of these

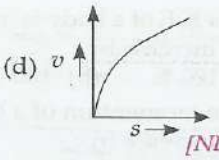
69. Two masses, each equal to m, are attached to one another by a massless string passing over a smooth pulley the tension in the string is :
(a) mg (b) $2\,mg$ (c) $mg/2$ (d) zero

70. A car accelerates from rest with acceleration 1.2 m/s². A bus moves with constant speed of 12 m/s in a parallel lane. How long does the car take from its start to meet the bus :
(a) 17 s (b) 8 s (c) 20 s (d) 12 s *[NDA 2008]*

71. A body starting from the rest moves along a straight line with constant acceleration. Which one of the following graphs represents the variation of speed (v) and distance(s)?
(a) 

(b) 

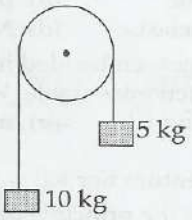
(c) 

(d) 

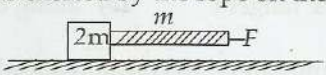
[NDA 2008]

72. The value of which one of the following quantity remains same in all system of units ?
(a) Acceleration due to gravity
(b) specific gravity
(c) pressure (d) density *[NDA 2007]*

73. Two teams are puling a rope with equal and opposite forces each of 5 KN in a tug of war so that a condition of equilibrium exists. What will be the tensile force in the rope ?
(a) zero (b) 2.5 kN (c) 5 kN (d) 10 kN *[NDA 2007]*

74. In the system given below, the masses are released from rest


What shall be acceleration of the moving masses ?
(a) g (b) $2g/3$ (c) $g/3$ (d) $g/2$ *[NDA 2006]*

75. A block of mass 2m is pulled along a horizontal frictionless surface by a rope of mass m as shown in the figure given. What force is exerted by the rope on the block ?


(a) $\frac{F}{3}$ (b) $\frac{F}{2}$ (c) $\frac{2F}{3}$ (d) F *[NDA 2006]*

76. A body moves with a constant speed along a curved path its acceleration :
(a) is zero (b) is parallel to its velocity
(c) can make any arbitrary angle with its velocity
(d) is perpendicular to its velocity *[NDA 2003]*

77. The distance between two crests in a wave in given by—
(a) Wave number (b) Wave velocity
(c) Amplitude (d) Wavelength *[SSC 2013]*

78. If a bomb dropped from an airplane explodes in mid-air :
(a) its KE increases
(b) its total energy increases
(c) its total energy decreases
(d) its total momentum decreases

79. A light body A and a heavy body B have equal kinetic energies of translation. Then :
(a) A has larger momentum than B
(b) B has larger momentum than A
(c) A and B have same momentum
(d) None of these

80. Magnetic, electrostatic and gravitational forces come under the category of :
(a) non contact forces (b) contact forces
(c) frictional forces (d) non frictional forces *[CDS 2013]*

81. If the K.E of a body is increased by 300%, its momentum will increase by :
(a) 100 % (b) 150 % (c) 200 % (d) 400 %

82. If the momentum of a body is increased by 50%, its K.E will increase by :
(a) 100 % (b) 125 % (c) 150 % (d) 200%

83. A body is lifted by a man to height of 1 m in 30 s. Another man lifts the same mass to the same height in 60 s. The work done by them are in the ratio :
(a) 1 : 2 (b) 1 : 1 (c) 2 : 1 (d) 4 : 1

84. In an elastic collision :
(a) momentum is conserved but energy is not
(b) energy is conserved but momentum is not
(c) both momentum and energy are conserved
(d) neither momentum nor energy is conserved

85. When two bodies stick together after the collision is said to be :
(a) perfectly elastic (b) partially elastic
(c) completely inelastic (d) None of these

86. A bullet hits and gets embedded in a solid block resting on a horizontal frictionless table. What is conserved ?
(a) momentum and KE (b) momentum
(c) KE
(d) neither momentum nor KE

87. A rocket works on the principle of conservation of :
(a) mass (b) linear momentum
(c) energy (d) angular momentum

88. A particle revolves round a circular path with a constant speed the acceleration of the particle is :
(a) along the circumference of the circle
(b) along the tangent (c) along the radius
(d) zero

89. For a body moving with constant speed in a horizontal circle, which of the following remains constant ?
(a) velocity (b) acceleration
(c) Centripetal force (d) KE

90. Roadways are banked on curves so that :
(a) the speeding vehicles may not fall inwards
(b) the frictional force between the road and vehicle may be decreased
(c) the wear and tear of tyre may be avoided
(d) the weight of the vehicle may be decreased

91. If a gymnast, standing on a rotating stool with his arms ant stretched, suddenly lowers his arms :
(a) His angular velocity decreases
(b) His angular velocity remains constant
(c) His angular velocity remains constant
(d) His moment of inertia increases

92. When the external torque on a system is zero, there will be conservation of its :
(a) linear momentum (b) angular momentum
(c) total energy (d) none of the above

93. Consider the following statements :
A 4–wheel vehicle moving in sharp circular path at high speed will :
1. overturn about its outer wheels
2. overturn about its inner wheels
3. skid outwards
4. skid inwards
Which of these statements are correct ?
(a) 1 and 3 (b) 2 and 4
(c) 2 and 3 (d) 1 and 4 *[IAS 2003]*

94. If the radius of the earth were shrink by one percent, its mass remaining the same, the value of g on the earth's surface would.
(a) increase by 0.5% (b) increase by 2%
(c) decrease by 0.5% (d) decrease by 2%
[IAS 2003]

95. The value of acceleration due to gravity on the surface of the earth is g. If the diameter of the earth becomes double of its present value and its mass remains unchanged, the value of acceleration due to gravity on the surface of the earth would become :
(a) $g/2$ (b) $g/4$
(c) $2g$ (d) $4g$

96. The weight of the body at the centre of the earth is :
(a) infinite (b) zero
(c) slightly less than that at the equator
(d) slightly move than that at the equator

97. Weightlessness experienced in spaceship is due to :
(a) absence of inertia (b) absence of gravity
(c) absence of accelerating force
(d) free fall of the spaceship

98. Satellite having the same orbital period as the period of rotation of the Earth about its own axis is known as :
(a) Polar satellite (b) Stationary satellite
(c) Geostationary satellite (d) INSAT *[CDS 2013]*

99. Two satellite are moving in the same circular orbit around the earth, they must have the same :
(a) mass (b) angular momentum
(c) KE (d) speed

100. If the distance between two masses is doubled, the gravitational attraction between them :
(a) is doubled (b) becomes four times
(c) is reduced to half (d) is reduced to a quarter

101. The relay satellite transmits the television programme continuously from one part of the world to another because its
(a) period is greater than the period of rotation of the earth about its axis.
(b) period is less than the period of rotation of the earth about its axis.
(c) period to equal to the period of rotation of the earth about its axis.
(d) mass is less than the mass of the earth.

102. The ratio of the inertial mass to gravitational mass is equal to
(a) $\frac{1}{2}$ (b) 1
(c) 2 (d) None of these

103. The intensity of the earth's gravitational field is maximum at :
(a) the equator (b) the centre of the earth
(c) the pole (d) None of these

104. The period of a satellite in a circular orbit of radius R is T. The period of another satellite in circular orbit of radius $4R$ is :
(a) $4T$ (b) $T/4$ (c) $T/8$ (d) $8T$

105. As we go from the equator to the poles, the value of g :
(a) remains the same (b) increases
(c) decreases (d) None of these

106. A satellite revolves around the earth in elliptic orbit, its speed is :
(a) same at all points on the orbit
(b) greatest when it is farthest from the earth
(c) greatest when its is closest to the earth
(d) None of these

107. If the diameter and mass of the earth becomes two times their present values then the weight of an object on the surface of the earth will :
(a) become half (b) become one-fourth
(c) remain unchanged (d) be doubled

108. Planet *A* has double the radius than that of Planet *B*. If the mass of Planet *A* is 4 times heavier than the mass of Planet *B*, which of the following statements regarding weight of an object is correct ?
(a) Heavier on Planet *A* than on Planet *B*
(b) Heavier on Planet *B* than on Planet *A*
(c) Same on both the Planets
(d) Cannot be measured on Planet *B* *[NDA 2014]*

109. Select the only correct statement from the following :
(a) The orbital velocity of a satellite increases with the radius of the orbit.
(b) Escape velocity of a particle from the surface of earth depends on the speed with which it is fired.
(c) The time period of a satellite does not depend on the radius of the orbit.
(d) The orbital velocity is inversely proportional to the square root of the radius of the orbit.

110. A geostationary satellite has an orbital period of :
(a) 2 hours (b) 6 hours
(c) 12 hours (d) 24 hours

111. Consider the following statements :
The acceleration due to earth's gravity decreases if
1. we go down from the surface of the earth towards its centre
2. we go up from the surface of the earth
3. we go from the equator towards the pole
4. the rotational speed of the earth is increased
Which of these statements are correct :
(a) 1 and 2 (b) 3 and 4
(c) 1, 2 and 4 (d) 2, 3 and 4

112. Consider the following statements :
The escape velocity depends on
1. mass of the planet
2. mass of the particles escaping
3. temperature of the planet
4. radius of the planet
Select the correct answer from the codes given below :
(a) 1 and 2 (b) 2 and 4
(c) 1 and 4 (d) 1, 3 and 4

113. Who among the following gave first the experimental value of G ?
(a) Newton (b) Cavendish
(c) Galileo (d) None of these

114. The escape velocity from the surface of the earth does not depend on :
(a) Mass of the earth (b) Mass of the body
(c) radius of the earth (d) G

115. If the radius of the earth's orbit becomes one fourth of the present value, the deviation of one year will become :
(a) 8 times (b) 4 times
(c) $\frac{1}{8}$ times (d) $\frac{1}{4}$ times

116. If the earth were to stop rotating, the value of '*g*' :
(a) increases (b) decreases
(c) remain unchanged (d) becomes zero

117. If we move from the equator to a pole, the value of *g* :
(a) increases (b) decreases
(c) remain unchanged (d) None of these

118. A pendulum clock is set to give correct time at the sea level. This clock is moved to a hill station at an altitude of 2500 m above the sea level. In order to keep correct time on the hill station, the length of the pendulum :
(a) has to be reduced (b) has to be increased
(c) needs no adjustment (d) None of these

119. A spring balance is graduated at sea level. If a body is weighed with this balance at consecutively increasing heights from the earth's surface, the weight indicated by the balance will :
(a) go on increasing continuously
(b) go on decreasing continuously
(c) remain the same
(d) first increase and then decrease

120. Which of the following statements is true ?
(a) *g* is less at the earth's surface than at a height above or at a depth below it.
(b) *g* is the same at all places on the surface of the earth.
(c) *g* has its maximum value at the equator.
(d) *g* is greater at the poles that at the equator.

121. If *Vo* be the orbital velocity of a satellite in a circular orbit colse to earth's surface and V_e is the escape velocity for the earth, relation between the two is :
(a) $V_o = V_e$ (b) $Ve = 2V_o$
(c) $V_e = \sqrt{2}\ V_o$ (d) $V_e = \sqrt{3}\ V_o$

122. The earth revolves round the sun in one year. If the distance between them becomes double, the new period of revolution will be :
(a) $\frac{1}{2}$ year (b) $2\sqrt{2}$ years
(c) 4 years (d) 8 years

123. The escape velocity of a particle of mass *m* varies as :
(a) m^0 (b) m (c) m^2 (d) m^{-1}

124. A geostationary satellite should be launched such that it moves from :
(a) north to south in the polar plane
(b) south to north in the polar plane
(c) east to west in the equatorial plane
(d) west to east in the equatorial plane

125. The plane of the orbit of an earth satellite :
(a) passes through the centre of the earth
(b) does not pass through the centre of the earth
(c) May or may not pass through the centre of the earth
(d) oscillates about the centre of the earth

126. The mass of moon is $\frac{1}{81}$ of earth's mass and its radius is $\frac{1}{4}$ of that of earth. If the escape velocity from the earth's surface is 11.2 km/s, is value for the moon is :
(a) 0.14 km/s (b) 0.5 km/s
(c) 2.5 km/s (d) 5.0 km/s

127. The tidal waves in the sea are primarily due to :
(a) the gravitational effect of the sun on the earth.
(b) the gravitational effect of the moon on the earth.
(c) the rotation of the earth
(d) the atmospheric effect of the earth itself.

128. If the earth were to skin faster, acceleration due to gravity at the poles :
(a) increases (b) decreases
(c) remains the same (d) None of these

129. The time period of an artificial satellite in a circular orbit is independent of :
(a) the mass of the satellite (b) radius of the orbit
(c) mass of the earth and radius of the earth
(d) none of the above

130. A ball is dropped from a spacecraft revolving around the earth. It will :
(a) continue to move with the same speed along the original orbit of the space craft
(b) move with the same speed tangentially to the orbit.
(c) fall down to the earth
(d) move away from the earth

131. When a particle executing S.H.M. passes through the mean position, it has :
(a) Minimum K.E. and Maximum P.E.
(b) Maximum K.E. and Minimum P.E.
(c) Maximum K.E. and Maximum P.E.
(d) Minimum K.E. and Minimum P.E.

132. The total energy of a particle vibrating in S.H.M. is proportional to the square of its :
(a) velocity (b) acceleration
(c) amplitude (d) None of the above

133. A simple pendulum is oscillating in a lift. If the lift starts moving upwards with a uniform acceleration, the period will :
(a) remain unaffected (b) be shorter
(c) be longer (d) None of these

134. In order to double the period of a simple pendulum :
(a) its length should be doubled.
(b) its length should be quadrupled.
(c) the mass of its bob should be doubled.
(d) the mass of its bob should be quadrupled.

135. A particle is executing S.H.M. Then the graph of acceleration as a function of displacement is :
(a) straight line (b) circle
(c) hyperbola (d) ellipse

136. If a hole is bored along a diameter of the earth and a stone is dropped into the hole it will :
(a) reach the centre of the earth and stop there.
(b) reach the other side of the earth and stop there.
(c) execute S.H.M. about the centre of the earth.
(d) execute oscillatory, but not simple harmonic motion about the centre of earth.

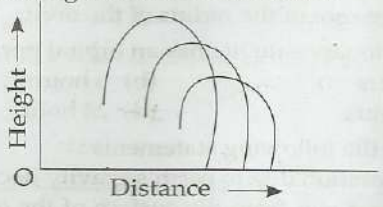
137. A simple pendulum is vibrating in an evacuated chamber. It will :
(a) come to rest eventually
(b) oscillate for ever with the same amplitude and frequency.
(c) oscillate with same frequency but amplitude will decreases with time.
(d) oscillate with the same amplitude but frequency will decrease with time.

138. The length of second's pendulum on surface of the moon, where g is $\frac{1}{6}$th of the value of g on the surface of the earth, is :
(a) $\frac{1}{36}$ m (b) $\frac{1}{6}$ m
(c) 6 m (d) 36 m

139. A girl is swinging on a swing in the sitting position. How will the period of swing be affected if she stands up ?
(a) The period will now be shorter.
(b) The period will now be longer.
(c) The period will remain unchanged.
(d) None of the above. *[IAS 1997]*

140. A simple harmonic oscillator has time period T. The time taken by it to travel from the extreme position to half the amplitude is :
(a) $\frac{T}{6}$ (b) $\frac{T}{4}$ (c) $\frac{T}{3}$ (d) $\frac{T}{2}$

141. A boy standing at the point O in the given diagram throws a ball three times with the same force, but projecting it along different inclinations from the ground. The results of the throws have been plotted in diagram. Which one of the following is a valid conclusion :



(a) The larger the initial inclination, then longer the throw.
(b) The larger the height reached, then longer the throw.
(c) The larger the height reached, shorter the throw.
(d) The larger the initial inclination, then greater the height reached. *[IAS 1997]*

142. Consider the following statements :
1. A geo-stationary satellite is at an approximate height of 10,000 km.
2. FM transmission of music is a very good quality because the atmospheric or man made noises. Which are generally frequency variations can do little harm.

Which of the statements give above is/are correct ?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2
[IAS 2005]

143. A spherical body moves with uniform angular velocity (ω) around a circular path of radius r. Which one of the following statements is correct ?
(a) The body has no acceleration.

(b) The body has a radial acceleration $\omega^2 r$ directed toward centre of path.
(c) The body has a radial acceleration $\frac{2}{5}\omega^2 r$ directed away from the centre of the path.
(d) The body has an acceleration ω^2 tangential to its path. *[IAS 2004]*

144. A car is running on a road at a uniform speed of 60 km/h. The net resultant force on the car is :
(a) driving force in the direction of car's motion.
(b) Resistance force opposite to the direction of car's motion.
(c) an inclined force
(d) equal to zero *[IAS 2004]*

145. The mass of a body on earth is 100 kg (acceleration due to gravity, $ge = 10 m/s^2$). If acceleration due to gravity on the moon is $\frac{ge}{6}$, then the mass of the body on the moon is :
(a) $\frac{100}{6}$ kg (b) 60 kg (c) 100 kg (d) 600 kg *[IAS 2001]*

146. The working principle of a Washing Machine is :
(a) centrifugation (b) dialysis
(c) reverse osmosis (d) diffusion *[IAS 2001]*

147. A simple pendulum has a time period T_1 when on the earth's surface, and T_2 when taken to height R above the earth's surface, where R is the radius of the earth. The value of $\frac{T_2}{T_1}$ is :
(a) 1 (b) $\sqrt{2}$ (c) 4 (d) 2

148. The young's modulus for perfectly rigid body is :
(a) zero (b) 1
(c) infinite (d) none of these

149. The modulus of rigidity of a liquid is :
(a) zero (b) 1
(c) infinite (d) none of these

150. Which of the following is most elastic :
(a) rubber (b) wet clay
(c) steel (d) plastic *[SSC Sec Officer 2007(Audit)]*

151. The pressure in a liquid at a given depth below the surface :
(a) is always exerted downward.
(b) is the same in all directions.
(c) equals the total weight of liquid above the depth.
(d) depends upon the amount of liquid below the depth.

152. It is easier to swim in a sea water than in ordinary water because :
(a) atmospheric pressure is highest at sea level.
(b) sea water contains salt.
(c) density of sea water is higher than that of ordinary water.
(d) density of sea water is less than that of ordinary water

153. The pressure at the bottom of a liquid tank does not depend on :
(a) acceleration due to gravity
(b) density of the liquid
(c) height of the liquid
(d) area of the liquid surface

154. A piece of ice has a stone in it and floats in a vessel containing water. When the ice melts, the level of water in the vessel would :
(a) remain unchanged (b) fall
(c) rise (d) none of the above

155. The operating principle of a hydraulic press is :
(a) Pascal's principle (b) Archimedes' principle
(c) Boyle's law
(d) Newton's law of gravitation

156. The pressure of the earth's atmosphere at sea level is due to the
(a) Fact that most living things constantly breathe air.
(b) gravitational attraction of the earth for the atmosphere
(c) evaporation of water from the seas and oceans.
(d) heating of the atmosphere by the sun.

157. An iron piece and a wooden piece have equal weights in air. If they are removed from air to vacuum :
(a) the iron piece appears to weigh more
(b) the wooden piece appears to weigh more
(c) there is no change in the weight of either
(d) none of the above

158. A floating body always displaces liquid equal to its own :
(a) mass (b) volume
(c) weight (d) none of these

159. Two pieces of different metals, when completely immersed in water, experience equal upthrust then :
(a) both pieces have equal weight in air.
(b) both pieces have same density.
(c) both pieces have equal volume
(d) none of these

160. For a body float in a liquid with some portion outside, the weight of the liquid displaced by the fully immersed body :
(a) should be equal to the weight of the body.
(b) should be more than the weight of the body.
(c) should be less than the weight of the body.
(d) none of these

161. A block of ice is floating in a glass containing water. When the ice melts completely, the level of the water in the glass will :
(a) rise (b) fall
(c) not change (d) none of these

162. A steel ball is floating in a beaker containing mercury. If some water is poured in the beaker, the steel ball will :
(a) move up (b) move down
(c) continue in its position
(d) execute vertical oscillation

163. A bird is sitting in a wire cage which is hanging from a spring balance, If the bird starts flying inside the cage, the reading of the spring balance will :
(a) remain unchanged (b) be less than earlier
(c) be more than earlier (d) none of these *[SSC Mat. 2000, 2002]*

164. The shape of a rain drop is spherical due to—
(a) Viscosity (b) Surface tension
(c) Elasticity (d) Gravitation *[SSC 2013]*

165. In order that a floating object be in stable equilibrium, its centre of buoyancy :
(a) should be vertically above its centre of gravity.
(b) should be vertically below its centre of gravity.
(c) should be horizontally in line with its centre of gravity
(d) may be anywhere

166. An inflated balloon rises to a definite height once it starts going up. This balloon cannot rise any further because at that height :
(a) atmosphere pressure reduces to zero.
(b) acceleration due to gravity reduces to zero.
(c) density of the balloon reduces to zero.
(d) apparent weight of the balloon reduces to zero.

167. A body is just floating in a liquid if the body is slightly pressed down and released it will :
(a) sink to the bottom
(b) start oscillating
(c) come back to the same position immediately
(d) come back to the same position slowly.

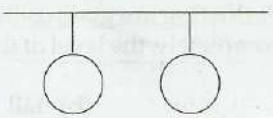
168. Bernoulli's theorem is based on the conservation of :
(a) mass (b) momentum
(c) energy (d) all of the above

169. Bernoulli's theorem is applicable to :
(a) flow of liquids (b) viscousity
(c) surface tension (d) static fluid pressure

170. Bernoulli's principle does not explain :
(a) curved path of a spinning ball.
(b) lift of a jet.
(c) working of a point sprayer.
(d) automatic blowing of 7 the roots of houses during blizzard in hilly areas.

171. An ideal liquid flows through a horizontal tube of variable diameter. The pressure is lowest where the :
(a) velocity is highest (b) velocity is lowest
(c) diameter is largest (d) None of these

172. Two light balls are suspended as shown in the figure. When the stream of air passes through the space between them, the distance between the balls will :



(a) increase (b) decrease
(c) remain the same
(d) may increase or decrease depending on the speed of air.

173. When a fluid passes through the constricted part of a pipe, its :
(a) velocity and pressure decrease
(b) velocity and pressure increase
(c) velocity decreases and pressure increases.
(d) velocity increases and pressure decreases.
[SSC Mat. 2000, 2002]

174. The rate of leak from a hole in a tank is :
(a) independent of its height from the bottom.
(b) more if situated near the bottom.
(c) more if situated near its top.
(d) more at midway between top and bottom.

175. 'Dynamic lift' is related to :
(a) Bernoulli's theorem (b) Archimedes' principle
(c) Equation of continuity (d) Pascal's law

176. A gale blows over a house. The force due to the gale on the roof is :
(a) in the downward direction
(b) in the upward direction
(c) zero (d) horizontal

177. A large tank having a small hole at the bottom is filled with water to a height h. If the stream of water coming out of the hole is directed vertically upwards it will :
(a) rise to height h
(b) rise to a height less than h
(c) rise to a height greater than h
(d) not rise at all

178. If a stream of air is blown under one of the pans of a physical balance in equilibrium, then the pan will :
(a) go up (b) go down
(c) not be affected (d) none of these

179. The velocity of flow of a liquid through an orifice at the bottom of a tank depends on the :
(a) area of the cross-section of the orifice
(b) height of the liquid above the orifice
(c) acceleration due to gravity
(d) both (b) and (c)

180. An application of Bernoulli's equation for fluid flow is found in :
(a) dynamic lift of an aeroplane
(b) viscosity meter
(c) capillary rise (d) hydraulic press

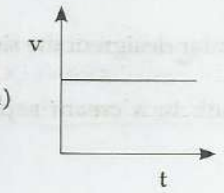
181. A hole is made in the bottom of a container having water filled up to a height h. The velocity of water flowing out of the hole is :
(a) independent of h (b) proportional to $h^{1/2}$
(c) proportional to h (d) proportional to h^2

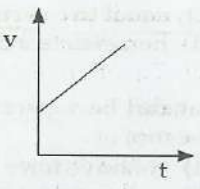
182. An ideal fluid is flowing in a tube of varying cross-section. At some point the radius of the tube is r and the velocity of flow is v. The velocity of flow at another point, where the radius is $r/2$ is :
(a) $v/4$ (b) $v/2$
(c) $2v$ (d) $4v$

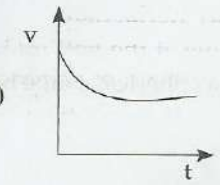
183. Viscosity is the property of liquids by virtue of which they :
(a) oppose the relative motion of its parts.
(b) push neighbouring molecules
(c) attract other molecules
(d) become conducting

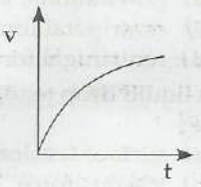
184. Three identical vessels A, B an C are filled with water, mercury and kerosene respectively up to a equal height. The three vessels are provided with identical taps at the bottom t=of the vessels. If the three taps are opened simultaneously, then which vessel is emptied first ?
(a) vessel B
(b) all the vessel A, B and C will be emptied simultaneously
(c) vessel A (d) vessel C *[IAS 2007]*

185. Which one of the following curves shows correctly the variation of velocity v with time t for a small spherical body falling vertically in a long column of viscous liquid ?

(a) 

(b) 

(c) 

(d) 

186. The velocity of rain drop attains constant value because of :
(a) Surface tension
(b) upthrust of air
(c) viscous force exerted by air
(d) air currents

187. The terminal velocity of a small sized spherical body of radius r falling in a viscous liquid is proportional to :
(a) $\frac{1}{r^2}$ (b) $\frac{1}{r}$
(c) r (d) r^2

188. A small drop falls from rest from a large height h in air. The final velocity is :
(a) almost independent of h
(b) proportional to h
(b) proportional to ...h
(c) inversely proportional to h

189. When the terminal velocity is reached, the acceleration of a body moving through a viscous medium is :
(a) zero (b) positive
(c) negative (d) none of these

190. If temperature rises, the coefficient of viscosity of liquid :
(a) decreases (b) increases
(c) remains unchanged (d) none of these

191. A small and a large rain drops are falling through air :
(a) the large drop moves faster
(b) The small drop moves faster
(c) Both moves with same speed
(d) None of the above

192. A liquid drop attains spherical shape due to—
(a) Surface tension (b) viscosity
(c) upward thrust (d) gravitation
[SSC (MTS) 2014]

193. When some detergent is added to water, the surface tension :
(a) increases (b) decreases
(c) remains unaffected (d) none of these

194. If a liquid wets a solid surface, the angle of contact is :
(a) 0° (b) 90°
(c) less than 90° (d) greater than 90°

195. A liquid will not wet the surface of solid if the angle of contact is :
(a) acute (b) obtuse
(c) zero (d) $\pi/2$

196. The tendency of liquid drop to contract and occupy minimum area due to :
(a) surface tension (b) viscosity
(c) density (d) vapour pressure
[IAS 1997]

197. The angle of contact of a liquid with a solid does not depend on :
(a) the angle of inclination of the solid to the solid-liquid surface
(b) the nature of the liquid and the solid
(c) the medium which exists above the free surface of the liquid
(d) none of these

198. The excess of pressure inside a drop or bubble is :
(a) directly proportional to its mass
(b) directly proportional to its radius
(c) inversely proportional to its radius
(d) inversely proportional to its surface tension

199. When the templerature increases, the angle of contact of a liquid :
(a) increases (b) decreases
(c) remain the same (d) none of these

200. Two capillary tubes of different diameters are dipped in water. The rise of water is :
(a) greater in the tube of smaller diameter
(b) greater in the tube of larger diameter
(c) same in both tubes
(d) none of these

201. Kerosene oil rises up in the wick of lantern because of :
(a) diffusion of the oil through the wick
(b) surface tension
(c) buoyant force of air
(d) the gravitational pull of the wick.

202. When there are no external forces the shape of a liquid drop is determined by :
(a) surface tension of the liquid
(b) density of the liquid
(c) viscosity of air
(d) temperature of air

203. Insects can move on the surface of water without sinking due to :
(a) dynamic lift
(b) viscosity of water
(c) surface tension of water
(d) none of these

204. Meniscus of mercury in a capillary is :
(a) concave (b) convex
(c) plane (d) cylindrical

205. With the rise of temperature, the surface tension of a liquid :
(a) increases (b) decreases
(c) remains unchanged (d) none of these

206. The dimensional formula for universal gravitational constant is—
(a) M^{-2} (b) $M^{-1} L^3 T^{-2}$
(c) $M^{-1} L^3 T^2$ (d) $ML^2 T^{-2}$ *[SSC (LDC) 2013]*

207. The mass of a body measured by a physics balance in a lift at rest is found to be m. If the lift is going up with an acceleration a, it amss will be measured as—
(a) m (b) zero
(c) $m\left(1-\frac{a}{g}\right)$ (d) $m\left(1+\frac{a}{g}\right)$ *[LDC 2014]*

208. When a body is immersed in a liquid, it force acting on it is—
(a) Upthrust (b) Weight
(c) Mass (d) Both (a) and (b) *[LDC 2013]*

209. Water drops do not stick to the oily surface due to
(a) lack of adhesive force
(b) surface tension
(c) cannot mix each other
(d) water is lighter than oil *[SSC (LDC) 2011]*

210. Newton's first law is also called as
(a) law of moments
(b) law of inertia
(c) law of energy
(d) law of momentum *[SSC (LDC) 2011]*

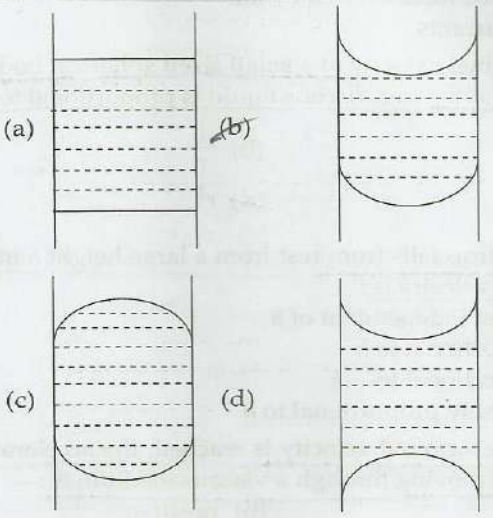
211. If we want to calculate the pressure of a liquid at the bottom of vessel, the quantity which is not required to determine it, is
(a) height of the liquid column
(b) surface area of the bottom of the vessel
(c) density of the liquid
(d) acceleration due to gravity at the bottom of the vessel *[SSC (LDC) 2011]*

212. A man inside an artificial satellite feels weightlessness because the force of attraction due to earth is
(a) zero at that earth is
(b) is balanced by the force of attraction due to moon
(c) equal to centripeated force
(d) non-effective due to particular design of the satellite *[SSC (LDC) 2011]*

213. Fat can be separated from milk in a cream separator because of :
(a) cohesive force
(b) gravitational force
(c) centripetal force
(d) centrifugal force *[SSC (LDC) 2011]*

214. A liquid drop tends to assume a spherical shape because of :
(a) surface tension
(b) viscous force
(c) gravitational force
(d) elastic force *[SSC (LDC) 2011]*

215. A vertical glass capillary tube open at both ends contains some water. Which of the following shapes may be taken by the water in the tube ?



Answers

1. (b)	2. (d)	3. (c)	4. (a)	5. (b)	6. (c)	7. (a)	8. (c)	9. (d)	10. (a)	11. (c)	12. (a)	13. (c)
14. (a)	15. (b)	16. (b)	17. (d)	18. (d)	19. (a)	20. (b)	21. (c)	22. (b)	23. (a)	24. (a)	25. (d)	26. (c)
27. (c)	28. (b)	29. (c)	30. (c)	31. (b)	32. (c)	33. (c)	34. (b)	35. (a)	36. (d)	37. (b)	38. (a)	39. (b)
40. (a)	41. (a)	42. (a)	43. (a)	44. (d)	45. (a)	46. (c)	47. (b)	48. (d)	49. (a)	50. (a)	51. (b)	52. (d)
53. (c)	54. (a)	55. (b)	56. (c)	57. (a)	58. (c)	59. (a)	60. (a)	61. (a)	62. (a)	63. (a)	64. (b)	65. (d)
66. (a)	67. (c)	68. (c)	69. (a)	70. (c)	71. (c)	72. (b)	73. (c)	74. (c)	75. (c)	76. (d)	77. (d)	78. (a)
79. (b)	80. (a)	81. (a)	82. (b)	83. (b)	84. (c)	85. (c)	86. (b)	87. (b)	88. (c)	89. (d)	90. (c)	91. (b)
92. (c)	93. (a)	94. (b)	95. (b)	96. (b)	97. (b)	98. (c)	99. (d)	100. (d)	101. (c)	102. (b)	103. (c)	104. (d)
105. (b)	106. (c)	107. (a)	108. (c)	109. (d)	110. (d)	111. (c)	112. (c)	113. (b)	114. (b)	115. (c)	116. (a)	117. (a)
118. (a)	119. (b)	120. (d)	121. (c)	122. (b)	123. (a)	124. (d)	125. (a)	126. (c)	127. (b)	128. (c)	129. (a)	130. (a)
131. (b)	132. (c)	133. (b)	134. (b)	135. (a)	136. (c)	137. (b)	138. (b)	139. (a)	140. (a)	141. (d)	142. (b)	143. (b)
144. (d)	145. (c)	146. (a)	147. (d)	148. (c)	149. (a)	150. (c)	151. (b)	152. (c)	153. (d)	154. (b)	155. (a)	156. (b)
157. (b)	158. (c)	159. (c)	160. (b)	161. (c)	162. (a)	163. (b)	164. (b)	165. (a)	166. (d)	167. (a)	168. (c)	169. (a)
170. (b)	171. (a)	172. (b)	173. (d)	174. (b)	175. (a)	176. (b)	177. (a)	178. (b)	179. (d)	180. (a)	181. (b)	182. (d)
183. (a)	184. (d)	185. (d)	186. (c)	187. (d)	188. (a)	189. (a)	190. (a)	191. (a)	192. (a)	193. (b)	194. (c)	195. (b)
196. (a)	197. (a)	198. (c)	199. (b)	200. (a)	201. (b)	202. (a)	203. (c)	204. (b)	205. (b)	206. (c)	207. (a)	208. (a)
209. (a)	210. (b)	211. (b)	212. (a)	213. (d)	214. (a)	215. (b)						

2. Heat

1. Heat energy of an object is
(a) the average energy of the molecules of the object
(b) the total energy of the molecules of the object ?
(c) the average velocity of the molecules of the object
(d) the average potential energy of the molecules of the object

2. Which of the following statements are true regarding heat?
(a) Heat is a form of energy
(b) Heat can be reflected by mirror
(c) Heat is an electromagnetic radiation
(d) Heat can not pass through vacuum.
Select the correct answer from the codes given below:
(a) 1, 2 and 3 (b) 2, 3 and 4
(c) 1, 2, and 4 (d) 1, 3 and 4

3. Heat is associated with
(a) K.E of random motion of molecules
(b) K.E. of orderly motion of molecules
(c) Total K.E of random and orderly motion of molecules
(d) None of these

4. Earliest thermometer was developed by
(a) Celsius (b) Fahrenheit
(c) Kelvin (d) Galileo

5. SI unit of temperature is
(a) Kelvin (b) Celsius
(c) Fahrenheit (d) Joule

6. The correct value of 0° C on the kelvin scale is
(a) 273 K (b) 27.315 K
(c) 275.15 K (d) 270 K

7. Centigrade and Fahrenheit temperatures are the same at
(a) – 273° (b) – 40° (c) 32° (d) 40°
[SSC (LDC) 2013]

8. Gas thermometers are more sensitive than the liquid thermometers because the gases
(a) have low specific heat (b) have high specific heat
(c) have large coefficient of expansion
(d) are lighter *[SSC (LDC) 2013]*

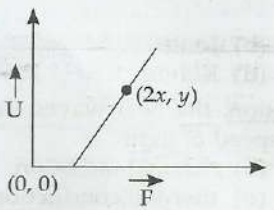
9. A temperature difference of 25° C is equivalent to a temperature difference of
(a) 25° F (b) 45° F (c) 67° F (d) 77° F

10. The absolute zero on celsius scale is
(a) – 200° C (b) – 273.15° C
(c) – 373.15° C (d) None of these

11. On thermometer, the freezing point of water is marked as 20° and the boiling point of water is marked as 150°. A temperature of 60° C will be read on this thermometer as
(a) 110° (b) 98° (c) 75° (d) 40°

12. If a graph is plotted taking the temperature in fahrenheit along the Y-axis and the corresponding temperature in celsins along X-axis it will be straight line
(a) having a positive intercept on the Y-axis
(b) having a positive intercept on X-axis
(c) passing through origin
(d) having negative intercepts on both the axis

13.



In the graph shown above, temperature in fahrenheit (F) is plotted along the X-axis while the corresponding temperature is celsius (C) is plotted along the Y-axis. What is the value of Y shown in the graph.
(a) 32° C (b) 64° C
(c) $\frac{160}{9}$° C (d) $\frac{480}{9}$° C *[NDA 2005]*

14. The gas thermometers is more sensitive than the liquid thermometers because gases
(a) expand more than liquids
(b) do not change their states easily
(c) are much lighter
(d) are easy to obtain

15. The range of platinum resistance thermometer is
(a) from – 200° C to 1600° C
(b) from – 200° C to 1200° C
(c) from – 200° C to 800° C
(d) from – 0° C to 1200° C

16. for the measurement of temperature of the order of 400° C, we will prefer
(a) mercury thermometer
(b) alcohol thermometer
(c) radiation thermometer
(d) thermocouple

17. Mercury thermometers can be used to measure temperature up to
(a) 260° C (b) 100° C (c) 360° C (d) 500° C

18. The change in temperature of a body is 50° C. The change on kelvin scale is
(a) 50 K (b) 60 K (c) 70 K (d) 323 K

19. The temperature of a gas is measured with a
(a) platinum resistance thermometer
(b) pyrometer
(c) gas thermometer
(d) vapour pressure thermometer

20. Which of the following in the correct device for the detection of thermal radiation ?
(a) constant volume gas thermometer
(b) liquid-in-glass thermometer
(c) thermopile
(d) none of these

21. The temperature of the sun is measured with
(a) platinum thermometer
(b) pyrometer
(c) gas thermometer
(d) vapour pressure thermometer

22. Fahrenheit scale divides two fixed points into
(a) 180 parts (b) 212 parts (c) 100 part (d) 32 parts

23. The normal temperature of human body is
(a) 37° C (b) 37° F (c) 104° F (d) 36.8° C

24. SI unit of heat is
(a) Calorie (b) Joule
(c) Kilo calorie (d) Kelvin

25. In which mode of transmission, the heat waves travel along straight line with the speed of light
(a) natural convection (b) thermal radiation
(c) forced convection (d) thermal conduction

26. When an object is heated, the molecules of that object
(a) began to move faster
(b) lose energy
(c) become heavier
(d) become lighter

27. Two block of lead, one twice as heavy as the other, are at 50° C. The ratio of heat content of the heavier block to that of the lighter block is
(a) 0.5 (b) 1 (c) 2 (d) 4

28. The quantity of heat required to change the temperature of 1 kg of substance by 1° C is called its
(a) Specific heat (b) the total energy
(c) the latent-heat (d) heat of fusion

29. A change of 10°C in Centigrade scale corresponds to what change in Fahrenheit scale ?
(a) 18° F (b) 21° F (c) 10° F (d) 15° F
[SSC (MTS) 2014]

30. At OK the velocity of the molecules is
(a) zero (b) infinity
(c) very large (d) of any value

31. The unit of the coefficient of linear expansion is
(a) m (b) /° C (c) m/° C (d) ° C

32. Coefficient of linear expansion always ..... with the increase in temperature
(a) increase (b) decrease
(c) remains (d) doubles itself

33. Choose the correct statement
(a) $\alpha : \beta : \gamma :: 1 : 3 : 2$ (b) $\alpha : \beta : \gamma :: 3 : 2 : 1$
(c) $\alpha : \beta : \gamma :: 2 : 3 : 1$ (d) $\alpha : \beta : \gamma :: 1 : 2 : 3$

34. A graph is plotted taking ° C along the Y–axis and of along the X – axis. It is a/an
(a) parabola (b) straight line
(c) ellipse (d) circle

35. A circular disc of copper has a symmetrical hole at its centre. The disc is uniformly heated. The diameter of the hole will
(a) increase (b) decrease
(c) remain the some (d) none of these

36. If the temperature scale is changed from ° C to ° F the numerical value of specific heat will
(a) increase (b) decrease
(c) remain unchanged (d) nothing can be said

37. Which of the following substances has greatest specific heat ?
(a) Iron (b) Water
(c) Copper (d) Mercury

38. When temperature is gradually decreased the specific heat of substance is
(a) decreased (b) increased
(c) remain unchanged (d) none of these

39. When lake starts freezing the formation of the ice will start first at the
(a) bottom (b) middle
(c) top (d) none of these

40. Glaciers always melt at the ..... first.
(a) top surface (b) sides
(c) bottom (d) middle surface

41. The unit of latent heat is
(a) cal-g (b) cal/°C
(c) cal/g (d) none of these

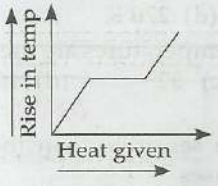
42. If the termal capacity of a body is infinity, then
(a) heat can never be added to it
(b) heat can never be extracted from it
(c) the temperature of the body can not be altered by adding or extracting any amount of heat
(d) it has infiniteamount of heat

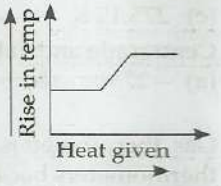
43. Calorimeters are generally made of
(a) copper (b) brass
(c) aluminium (d) zinc

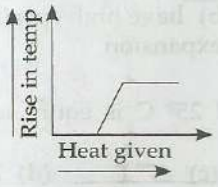
44. One Joule is approximately equal to
(a) 0.28 cal (b) 0.32 cal (c) 0.24 cal (d) 4.2 cal

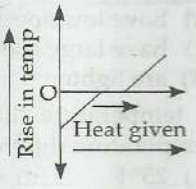
45. If a substance contracts on heating, its co-efficient of linear expansion is
(a) + ve (b) – ve (c) zero (d) infinity

46. 100 g of ice at – 15° C was heated, the rise in termperature of ice was plotted against the heat given to ice. Which of the following graphs correctly depicts this behaviour ?

(a) 

(b) 

(c) 

(d) 

47. The unit of RH are
(a) kg - m^3 (b) kg
(c) kg - m^2 (d) none of these

48. At dew point RH is
(a) 100% (b) 50% (c) 25% (d) 0%

49. The most comfortable value for RH is
(a) 10% (b) 30% (c) 50% (d) 100%

50. When air is saturated, it cannot hold
(a) more water vapour (b) more air
(c) more CO_2 (d) more O_2

51. If RH is high
(a) we feel sultry (b) we perspireless
(c) clothes do not dry easily (d) all of above are correct

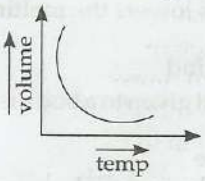
52. A fan produces a feeling of comfort during hot weather because
(a) fan supplies cold air
(b) our perspiration evaporates rapidly
(c) our body radiates more heat in air
(d) conductivity of air increases.

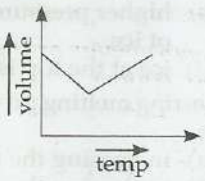
53. Device used to measure very high temperature is
(a) pyrometer (b) thermometer
(c) bolometer (d) calorimeter

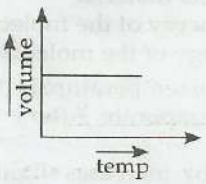
54. A solid metal ball has aspherical cavity. If the ball is heated, the volume of the cavity will
(a) increase (b) decrease
(c) remain unaffected (d) none of these

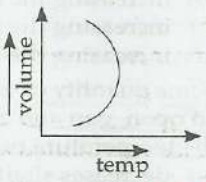
55. A metal sheet with circular hole is heated. The hole will
(a) contract (b) expand
(c) remain unaffected (d) none of these

56. The relation between volume and temperature of a sample of water in the range 0° C to 100° C is best represented by

(a) 

(b) 

(c) 

(d) 

[NDA 2002]

57. A liquid initially contracts when cooled down to 4°C but on further cooling down to 0°C, it expands. The liquid is :
(a) Alcohol (b) Water
(c) Molten iron (d) Mercury *[CDS 2013]*

58. A bimetal made copper and iron strips welded together is straight at room temperature. It is held vertically with iron strip towards left and copper strip towards right. if this bimetal is heated, it will
(a) remain straight (b) bend towards right
(c) bend towards left (d) bend towards

59. A metal ball is being weighed in a liquid whose temperature is raised continuously. Then the apparent weight of the ball
(a) remain unchanged (b) increases
(c) decreases (d) changes erratically

60. When water is heated from 0° C to 10° C, its volume
(a) decreases (b) increases
(c) remain unchanged
(d) first decreases and then increases

61. A sealed container contains helium gas at 300 K. If it is heated to 600 K the average kinetic energy of the helium atoms
(a) remain unchanged (b) is doubled
(c) becomes $\sqrt{2}$ times (d) none of these

62. A gas is enclosed in a container which is then placed on a fast moving train. The temperature of the gas
(a) rises (b) falls
(c) remain unchanged (d) becomes unsteady

63. When an ideal gas under goes an isothermal expansion, the pressure of the gas in the enclosure falls. This is due to
(a) decreased in the change of momentum per collision
(b) decrease in the frequency of collision
(c) decrease in the frequency of collision and the change of momentum per collision
(d) decrease in neither the frequency of collision nor the change of momentum per collision

64. The pressure exerted on the walls of the container by a gas is due to the fact that the gas molecules
(a) lose their kinetic energy
(b) stick to the walls
(c) are accelerated towards the walls
(d) change their momenta due to collision with the walls

65. Pressure exerted by gas is
(a) independent of the density of the gas
(b) inversely proportional to the density of the gas
(c) directly proportional to the density of the gas
(d) directly proportional to the square of the density of the gas

66. A gas behaves as an ideal gas more closely at
(a) low pressure and high temp
(b) high pressure and low temp
(c) low pressure and low temp
(d) high pressure and high temp

67. Temperature can be expressed as a derived quantity in terms of
(a) length and mass (b) mass and time
(c) length, mass and time (d) none of these

68. At a given volume and temperature, the pressure of a gas
(a) varies inversely as its mass
(b) varies inversely as the square of its mass
(c) varies linearly as its mass
(d) is independent of its mass

69. The product of the pressure and volume of an ideal gas is
(a) a constant
(b) approximately equal to the universal gas constant
(c) directly proportional to its temp
(d) inversely proportional to its temp

70. For an ideal gas the interparticle interaction is
(a) attractive (b) repulsive
(c) very large (d) zero

71. The first law of thermodynamics is concerned with the conservation of
(a) number of molecules (b) energy
(c) numbers of moles (d) temperature

72. Heat given to an ideal gas under isothermal conditions is used
(a) increasing the temp
(b) in doing external work
(c) in increasing the internal energy
(d) none of these

73. Two samples *A* and *B* of the same mass of a gas, initially at the same pressure, temperature and volume are compressed to half the original volume. A isothermally and B adiabatically. The final pressure of A is
(a) greater than that of B (b) equal to that of B
(c) less than that of B (d) twice that of B

74. In an isothermal expansion of a gas
(a) a pressure remains constant
(b) temperature remains constant
(c) density remains constant
(d) none of these

75. If an ideal gas is isothermally expanded, its internal energy will
(a) increase (b) decrease
(c) remain the same (d) none of these

76. A gas is a metallic cylinder is suddenly compressed by a piston which is maintained at the same position with the passage of time the pressure of air
(a) increases (b) decreases
(c) remains the same (d) none of these

77. The specific heat of a gas at constant pressure is greater than the specific heat at constant volume because
(a) work is done in the expansion of the gas at constant pressure
(b) work is done in the expansion of the gas at constant volume
(c) the attraction between the molecules increases at constant pressure
(d) the molecular collision increases at constant pressure

78. A gas has
(a) one specific heat (b) two specific heat
(c) three specific heat (d) infinite specific heat

79. The heat transferred by the radiator of a refrigerator is
(a) more than that at the freezer
(b) less than that at the freezer
(c) the same as that at the freezer
(d) none of these

80. Melting point of ice
(a) increases with increase of pressure
(b) decreases with increase of pressure
(c) is independent of pressure
(d) none of these

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

82. In a pressure cooker the cooking is fast because
(a) the boiling point of water is raised by the increased pressure inside the cooker
(b) the boiling point of water is lowered by the increased pressure
(c) more steam is available to cook the food at 1000° C
(d) none of these

83. It is difficult to cook at high altitudes because
(a) there is less oxygen in the air
(b) due to falling temperature, more heat has to be given
(c) due to decrease in atmospheric pressure, the boiling point of water decreases
(d) of high moisture content there

84. Cooking taken longest time
(a) at the sea level (b) at Simla
(c) at Mount Everest (d) none of these

85. Paraffin wax contracts on solidification the melting point of wax
(a) increases with increase of pressure
(b) decreases with increase of pressure
(c) in independent of pressure
(d) none of these

86. A large iceberg melts at the base but not at the top because
(a) the base of iceberg remains in warmer conditions
(b) ice at the base contains impurities
(c) higher pressure at the base lowers the melting point of ice.
(d) ice at the top is different kind

87. During melting process the beat given to a body is utilised in
(a) increasing the temperature
(b) increasing the density of the material
(c) increasing the potential energy of the molecules
(d) increasing the kinetic energy of the molecules

88. Some quantity of water at room temperature is placed in an open pan and allowed to evaporate. After sometime the temperature of water
(a) decreases slightly (b) increases slightly
(c) remains unchanged (d) none of these

89. The boiling point of a liquid is
(a) affected by addition of soluble solid
(b) increases with increase of pressure
(c) both (a) and (b)
(d) None of these

90. A closed bottle containing water at room temperature is taken to the moon and then the lid is opened. The water will
(a) freeze (b) boil
(c) decompose into hydrogen and oxygen
(d) not change at all

91. The critical temperature of a gas is the temperature
(a) at which Boyle's law is strictly obeyed
(b) at which the gas liquefies at a pressure of one atmosphere
(c) above which the gas cannot be liquefied
(d) Below which the gas cannot be liquefied

92. The relative humidity of air can decrease in spite of an increase in the absolute humidity when the
(a) pressure rises (b) pressure falls
(c) temperature rises (d) temperature falls

93. Water evaporates at atmospheric pressure at a certain rate. If now the some water is placed in vaccum, the rate of evaporation
(a) will increase (b) will decrease
(c) will remain unchanged (d) none of these

94. If the atmospheric temperature and the due point are nearly equal then
(a) the relative humidity is 100%
(b) the relative humidity is zero
(c) the relative humidity is 50%
(d) none of these

95. If the temperature inside a room is increased, the relative humidity will
(a) increase (b) decrease
(c) remain unchanged (d) none of these

96. A liquid boils at a temperature at which its saturated vapour pressure becomes
(a) equal to the atmospheric pressure
(b) twice the atmospheric pressure
(c) half the atmospheric pressure
(d) none of the above

97. With rise of boiling point of a water the latent heat of steam
(a) decreases (b) increased
(c) does not change (d) none of these

98. In an isothermal change an ideal gas obey's
(a) Boyle's law (b) Charle's Law
(c) Gay-Lussac's Law (d) None of these

99. A refrigerator, with its power on, is kept in closed room with its door open. The temperature of the room will
(a) rise (b) fall
(c) remains the same (d) none of these

100. When a gas expands adiabactically
(a) no energy is required for expansion
(b) energy is required and it comes from the wall of the container of the gas
(c) internal energy of the gas in used in doing work
(d) law of conservation of energy does not hold

101. Heat capacity of substance is infinite. It means :
(a) infinite heat is given out
(b) infinite heat is taken in
(c) no change in temperature whether heat is taken in or given out
(d) all of these

102. A sample of gas expands from volume V_1 to V_2. The amount of work done by the gas is greatest when the expansion is
(a) iso thermal (b) isobaric
(c) adiabatic (d) equal in all cases

103. Specific heat of a metal at very low temperatures varies as
(a) T (b) T^2 (c) $T^{3/2}$ (d) T^3

104. The SI unit of mechanical equivalent of heat in
(a) joules-calorie (b) joules/calorie
(c) calorie-ergs (d) ergs/calorie

105. During adiabatic compression of a gas its temperature
(a) remains constant (b) becomes zero
(c) falls (d) rises

106. A amount of heat required to raise the temperature of a body through 1 K is called its
(a) thermal capacity (b) entropy
(c) specific heat (d) water equivalent

107. The first operation involved in a Carnot cycle is
(a) isothermal expansion (b) adiabatic expansion
(c) isothermal compression (d) adiabatic compression

108. $\frac{PV}{T}$ = constant is true for
(a) isothermal changes only
(b) adiabatic changes only
(c) both isothermal and adiabatic changes
(d) neither isothermal nor adiabatic changes

109. In which of the following process the internal energy of a system remains constant ?
(a) adiabatic (b) isothermal
(c) isobaric (d) non of these

110. In a cyclic process the change in the internal energy of system is
(a) maximum but not zero
(b) maximum but not infinite
(c) zero
(d) infinite

111. The temperature at which the vapour pressure of a liquid becomes equal to the external (atmospheric) pressure is its
(a) melting point (b) boiling point
(c) inversion point (d) none of these

112. A cooking pot should have
(a) high specific heat and low conductivity
(b) high specific heat and high conductivity
(c) low specific heat and low conductivity
(d) low specific heat and high conductivity

113. The freezer in a refrigerator is located at the top section so that :
(a) the entire chamber of the refrigerator is cooled quickly due to convection
(b) the motor is not heated
(c) the heat gained from the environment is high
(d) the heat gained from the environment is low

114. A piece of glass is heated to high temperature and then allowed to cool. If it cracks, a possible reason for this is the following property of glass
(a) low thermal conductivity
(b) high thermal conductivity
(c) high specific heat
(d) low specific heat

115. The thermal conductivity of a plate depends on
(a) the temperature difference between the two sides
(b) the thickness of the plate
(c) the area of the plate
(d) none of these above

116. While measuring the thermal conductivity of a liquid, we keep the upper part hot and the lower part cool because
(a) heat conduction is easier downwards
(b) convection gets stopped in this way
(c) radiation gets stopped in this way
(d) it is easier and more convenient to do so

117. It is hotter for the same distance over the top of a flame than it is on one side of it because
(a) more heat is radiated upwards
(b) air conducts more heat upwards
(c) convection takes heat upward
(d) of some reason other than the above three

118. A hot body will radiate maximum energy if its surface is
(a) white and rough (b) white and polished
(c) black and rough (d) black and polished

119. A polished metal plate with rouph black spot on it is heated to about 2000 k and quickly taken to a dark room. Then the spot
(a) will appear brighter than the plate
(b) will appear darker than the plate
(c) and the plate will appear equally bright
(d) none of these

120. A sphere, a cube, and thin circular plate, all having the same mass and made of the same material are heated to the same temperature and then allowed to cool, which of then cools fastest ?
(a) sphere (b) cube
(c) circular plate (d) all at the same rate

121. If the absolute temperature of a perfectly black body is doubled, then its rate of radiation increases by a factor of
(a) 2 (b) 4 (c) 8 (d) 16

122. The absorptive power of a perfectly black body is
(a) 1 (b) 0 (c) (d) none

123. A piece of blue glass heated to a high temperature and piece of red glass at room temperature are taken inside dimly-lit room. Then
(a) the blue piece will look blue and the red piece will red as usual
(b) both the piece will look equally red
(c) the blue piece will look brighter red as compared to the red piece
(d) both the pieces will look red but the blue piece will be dimmer

124. Which of the following statement (s) is (are) true about thermal radiations ?
(i) thermal radiations are electromagnetic waves
(ii) all bodies emit thermal radiations at all temperature
(iii) thermal radiations are reflected from mirror
(iv) thermal radiations of all wavelengths travel in free space with same velocity
Choose the correct answer
(a) (i), (ii) and (iii) (b) (ii), (iii) and(iv)
(c) (iii) and (iv) (d) all of them

125. According to Newton's law of cooling, the rate of cooling of a body is proportional to the
(a) temperature of the body
(b) temperature of the surrounding
(c) difference of the temperature of the body and its surroundings
(d) none of these

126. A body cools from 85° C to 80° C in 5 minutes. The time taken to cool from 80° C to 75° C is
(a) less than 5 minutes (b) more than 5 minutes
(c) 5 minutes (d) none of these

127. Which of the following statements is wrong ?
(a) Stefan's constant is the same for all black bodies
(b) thermal radiations travel with the speed of 3×10^8 ms^{-1}
(c) thermal radiations exhibit diffraction
(d) Stefan's law is applicable for all heated body

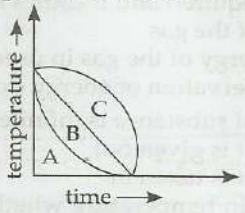
128. Heat is transmitted from higher to lower temperature through actual mass motion of the molecules in
(a) conduction (b) convection
(c) radiation (d) all of the above

129. A piece of metal and a piece of wood are kept at temperature of 45° C on touching the two of them with hand
(a) the two will appear equally hot
(b) the piece of wood will appear hotter than the piece of metal
(c) the piece of metal will appear hotter than the piece of wood
(d) the distinction in the hotness will not be possible

130. A electric heater, kept in vacuum, is heated continuously by passing electric current. Its temperature
(a) will go on rising with time
(b) will stop rising after some time as it will lose heat to the surrounding by conduction
(c) will become constant after some time because of loss of heat due to radiation
(d) none of these

131. A body cools from 60° C to 50° C in 10 minutes when kept in air at 30° C. In the next 10 minutes its temperature will be
(a) below 40° C (b) 40° C
(c) above 40° C (d) Can not be predicted

132. A block of steal heated to 100° C is left in a room to cool. Which of the curves shown in the figure represents the decrease of temperature with time ?



(a) A (b) B (c) C (d) None

133. Thermo flask prevents heat loss by
(a) radiation (b) conduction
(c) convection (d) all of the above

134. Woollen clothes keep the body warm because
(a) wool increases the temperature of the body
(b) wool is the bad conductor of the heat so it does not allow heat to flow out of the body
(c) wool absorbs radiant heat from outer objects
(d) wool rejects heat from outer objects

135. A glass container cracks when very hot tea is poured into it. A probable reason for this is the
(a) low thermal conductivity of glass
(b) high thermal conductivity of glass
(c) low specific heat of glass
(d) none of these

136. If the temperature of a hot body is increased by 50%, the amount of radiation emitted by it increases approximately by
(a) 225% (b) 250% (c) 400% (d) 500%

137. Which is the fastest mode of heat loss ?
(a) conduction (b) convection
(c) radiation (d) all are equally fast

138. A solid sphere of radius R and a hollow sphere of inner radius R/2 and outer radius R, made of copper, are heated to the same temperature and are allowed to cool in the same environment. Then
(a) hollow sphere cools faster
(b) both the spheres attain room temperature at the same time
(c) solid sphere cools faster
(d) none of these

139. A solid cube and solid sphere of the same material have equal surface areas. Both are at the same temperature of 120° C then
(a) both of them will cool down at the same rate
(b) the cube will cool down faster than the sphere
(c) the sphere will cool down faster than the cube
(d) none of these

140. Relation between the colour and the temperature of a star is given by
(a) Wean's Displacement Law
(b) Planck's Law (c) Hubble's Law
(d) Hippacrus Rule

141. 300 g of water at 25° C is added to 100 g of ice at 0° C. The final temperature of the mixture in
(a) 0° C (b) 1° C (c) 2° C (d) 3° C

142. The process in which no heat enters or leaves the system in termed as
(a) isochoric (b) isobaric
(c) isotherma (d) adiabatic

143. Mode of transmission of heat in which heat carried by a moving particles is
(a) conduction (b) radiation
(c) wave motion (d) convection

144. The mechanical equivalent of heat J is :
(a) a constant (b) a physical quantity
(c) a conversion factor (d) none of these

145. Rate of diffusion is
(a) faster in solids than in liquids and gases
(b) faster in liquids than in solids and gases
(c) faster in gases than in liquids and gases
(d) equal in solids, liquids and gases

146. Water is usual as coolant in the radiator of a car engine because it
(a) has low density (b) has high specific heat
(c) has low boiling point (d) is easily available

147. Internal energy of a perfect gas is independent of
(a) pressure (b) volume
(c) temperature (d) none of these

148. At absolute zero temperature, the kinetic energy of the molecules
(a) becomes maximum (b) becomes minimum
(c) remains constant (d) becomes zero

149. Thermal radiations are electromagnetic wave belonging to :
(a) ultraviolet (b) visible region
(c) gamma region (d) infrared region

150. A white and smooth surface is—
(a) good absorber and bad reflector of heat
(b) bad absorber and bad reflector of heat
(c) good absorber and good reflector of heat
(d) bad absorber and good reflector of heat *[LDC 2013]*

151. The saturated vapour pressure of water at 100° C
(a) 750 mm of Hg (b) 760 mm of Hg
(c) 76 mm of Hg (d) 7.6 mm of Hg

152. The clouds float in the atmosphere because of their low
(a) temperature (b) velocity
(c) pressure (d) density *[IAS 1995]*

153. Low temperatures (cryogenies) find application in :
(a) space travel, surgery and magnetic levitation
(b) surgery, magnetic levitation and telemetry
(c) space travel, surgery and telemetry
(d) space travel, magnetic levitation and telemetry
[IAS 1999]

154. When water is heated from 0° C to 10° C its volume
(a) increases (b) decreases
(c) does not change
(d) first decreases and then increases *[IAS 2001]*

155. The change of a solid into vapour directly is called
(a) vaporization (b) freezing
(c) melting (d) sublimation
[44th BPSC (PT)]

156. A hollow sphere of radius *R*, a hollow cube of side *R* and thin circular plate of radius *R* made up of the some material, are all heated to 20° C above room temperature. When left to cool in the room, which of them will reach the room temperature first ?
(a) circular plate (b) cube
(c) sphere
(d) all of them will reach the room temperature at the same time *[IAS 2002]*

157. Consider the following statements :
(1) steam at 100° C and boiling water at 100° contain same amount of heat
(2) Latent heat of fusion of ice is equal to the latent heat of vaporization of water
(3) I am air-conditioner, heat is extracted from the room air at the evaporator coils and is rejected out at the con denser coils
Which of these statements is / are correct ?
(a) 1 and 2 (b) 2 and 3
(c) only 2 (d) only 3 *[IAS 2003]*

158. What is the principle by which a cooling system (Radiator) in a motor car works ?
(a) conduction only
(b) convection
(c) Radiation only
(d) both conduction and radiation *[IAS 2010]*

159. Which of the following is the best conductor of the heat
(a) mercury (b) silver (c) leather (d) benzene
[UPPCS (PT) 1996]

160. In the winter season if we touch two blocks one of iron and another of wood in the early morning then the block of iron appears to be more cold because
(a) the temperature of the iron block is less than that of the wooden block
(b) iron is a bad conductor of heat in comparison of the wood
(c) iron is a bad conductor of heat in comparison of the wood
(d) the block of iron is heavier than the wooden block
[41th BPSC (PT) - 1996]

161. The water from a hand-pump is warm in winter because
(a) our body is cold in winter and water appears to be warm
(b) the temperature inside the earth is higher than the atmospheric temperature
(c) the pumping process causes friction which warms up the water
(d) inside water comes out and absorbs heat from the environment *[UPPCS (PT) - 1993]*

162. Which colour of heat radiation represents the highest temperature ?
(a) blood red (b) dark chery
(c) salmon (d) white *[CDS - 2008]*

163. Which one of the following statements is correct ?
Transfer of heat energy from a heater coil to the cooking vessel takes place through the process of
(a) convection only
(b) conduction and convection only
(c) radiation and convection only
(d) convection, conduction and radiation *[CDS - 2006]*

164. How can boiling point of a liquid be reduced ?
(a) by adding a solid of lower melting point
(b) by dissolving a soluble solid in it
(c) by increasing the pressure on the liquid
(d) by decreasing the pressure on the liquid *[CDS 2005]*

165. The temperature of a body is an indicator of
(a) the total energy of the molecules of the body
(b) the average energy of the molecules of the body
(c) the total velocity of the molecules of the body
(d) the average kinetic energy of the molecules of the body *[CDS 2004]*

166. At normal temperature, due to a puncture, the compressed air inside the tube of a car wheel suddenly starts coming out. Then the air inside the tube
(a) starts becoming hotter
(b) starts becoming cooler
(c) remains at the same temperature
(d) may become hotter or cooler depending on the amount of water vapour present in the air. *[CDS 2003]*

167. Which one of the following is true for the flow of water from high level to low level (at constant temperature and pressure) ?
(a) $G = 0$ (b) $G = 1$
(c) $G < 0$ (d) $G =$ *[CDS 2002]*

168. Two bodies *A* and *B* are of same mass and same amount of heat is given to both of them.
If the temperature of *A* increases more than that of *B* because of heat addition, then
(a) the specific heat capacity of *A* is more than that of *B*
(b) The specific heat capacity of *A* is less than that of *B*
(c) Both *A* and *B* have the same specific heat capacity but *A* has greater thermal conductivity
(d) Both *A* and *B* the same specific heat capacity but B has greater thermal conductivity. *[CDS 2002]*

169. A real gas can be liquefied by the application of pressure when its temperature is
(a) Above the room temperature
(b) Above the inversion temperature
(c) At the Boyle temperature
(d) At the critical temperature *[CDS 2000]*

170. Night are cooler in the deserts than in the plains because
(a) sand radiates heat more quickly than the earth
(b) the sky remains clear most of the time
(c) sand absorbs heat more quickly than the earth
(d) of none of the above reasons *[CDS - 2000]*

171. The unit of temperature adopted by the SI (international system of units) is the celsius and kelvin scales. It is based on the
(a) melting point of ice
(b) boiling point of water
(c) triple point of water corresponding to -0.01° C
(d) temperature at which solid, liquid and gaseous water are all in equilibrium, i.e., -273° C *[CDS - 2000]*

172. Clear night are colder than cloudy nights because of
(a) conduction (b) condensation
(c) radiation (d) insolation
[SSC GL - 2004]

173. A gas thermometer is more sensitive than a liquid thermometer because a gas
(a) is lighter than liquid
(b) expands more than a liquid
(c) is easy of obtain
(d) does not change state easily *[SSC GL - 2004]*

174. The speed of light with the rise in the temperature of the medium
(a) increases (b) decreases
(c) Remains unaltered (d) Drops suddenly
[SSC GL - 2004]

175. Clothes keep us warm in winter because they
(a) supply heat (b) do not radiate heat
(c) prevent air from contacting the body
(d) prevent the heat of the body from escaping
[SSC GL - 2004]

176. The best conductor of heat among the following is –
(a) Alcohol (b) Mercury (c) Ether (d) Water
[SSC GL - 2003]

177. Metal tea pots have wooden handles because
(a) wood is a bad conductor of heat
(b) it prevents electric shock
(c) its gives beauty to the pots
(d) it is hygienic *[SSC (LDC) - 2011]*

178. White clothes are cooler than black ones because they
(a) absorb all the light that reaches them
(b) reflect all the light that reaches them
(c) will not allow the light to penetrate
(d) cool the sun light completely *[SSC (LDC) - 2011]*

179. Water is used in hot water bags because
(a) it is easily obtained
(b) it is cheaper and is not harmful
(c) it has high specific heat
(d) it is easy to heat water *[SSC (LDC) - 2011]*

180. An instrument used to measure humidity is
(a) anemometer (b) hygrometer
(c) thermometer (d) pyrheliometer
[SSC (LDC) - 2011]

181. At upper atmosphere, an astronaut feels
(a) extremely hot (b) slightly hotter
(c) extremely cool (d) slightly cooler
[SSC (LDC) - 2011]

182. Which of the following is the example of ideal black body
(a) kajal (b) black board
(c) a pin hole box (d) none of these

183. The wavelength of the radiation emitted by a body depends upon
(a) the nature of the surface
(b) the area of the surface
(c) the temperature of the surface
(d) all of the above factors

184. The temperature of water at the bottom of a waterfall is higher than that at the top because
(a) water at the bottom has greater potential energy
(b) the surface at the bottom provides heat
(c) kinetic energy of falling water is converted into heat
(d) falling water absorbs heat from the surroundings
[SSC (LDC) - 2011]

185. The energy that can harness heat stored below the earth's surface is known as :
(a) thermal energy (b) nuclear energy
(c) tidal energy (d) geo-thermal energy
[SSC (LDC) - 2011]

186. The temperature of boiling water in a steam engine may be high because :
(a) there are dissolved substances in water
(b) there is low pressure inside the boiler
(c) there is high pressure inside the boiler
(d) the fire is at very high temperature *[SSC (LDC) - 2011]*

Answers

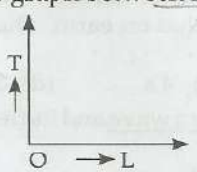
1. (b)	2. (d)	3. (a)	4. (d)	5. (a)	6. (b)	7. (b)	8. (a)	9. (b)	10. (b)	11. (b)	12. (a)	13. (c)
14. (a)	15. (b)	16. (d)	17. (c)	18. (a)	19. (b)	20. (c)	21. (b)	22. (a)	23. (a)	24. (b)	25. (b)	26. (a)
27. (c)	28. (a)	29. (a)	30. (a)	31. (b)	32. (c)	33. (d)	34. (b)	35. (a)	36. (b)	37. (b)	38. (a)	39. (c)
40. (c)	41. (c)	42. (c)	43. (a)	44. (c)	45. (b)	46. (d)	47. (d)	48. (a)	49. (c)	50. (a)	51. (d)	52. (b)
53. (a)	54. (a)	55. (b)	56. (b)	57. (b)	58. (c)	59. (b)	60. (d)	61. (b)	62. (c)	63. (b)	64. (d)	65. (c)
66. (c)	67. (d)	68. (c)	69. (c)	70. (d)	71. (b)	72. (b)	73. (c)	74. (b)	75. (c)	76. (b)	77. (a)	78. (d)
79. (a)	80. (b)	81. (d)	82. (a)	83. (c)	84. (c)	85. (a)	86. (c)	87. (c)	88. (a)	89. (c)	90. (b)	91. (c)
92. (c)	93. (a)	94. (a)	95. (b)	96. (a)	97. (a)	98. (a)	99. (a)	100. (c)	101. (c)	102. (b)	103. (a)	104. (b)
105. (d)	106. (a)	107. (a)	108. (c)	109. (b)	110. (c)	111. (b)	112. (b)	113. (a)	114. (a)	115. (c)	116. (b)	117. (c)
118. (c)	119. (a)	120. (c)	121. (d)	122. (a)	123. (c)	124. (d)	125. (c)	126. (b)	127. (d)	128. (b)	129. (c)	130. (c)
131. (c)	132. (a)	133. (d)	134. (b)	135. (a)	136. (c)	137. (b)	138. (a)	139. (b)	140. (a)	141. (a)	142. (d)	143. (d)
144. (c)	145. (c)	146. (b)	147. (d)	148. (d)	149. (d)	150. (d)	151. (b)	152. (a)	153. (a)	154. (d)	155. (d)	156. (c)
157. (d)	158. (b)	159. (b)	160. (b)	161. (b)	162. (d)	163. (c)	164. (d)	165. (d)	166. (c)	167. (c)	168. (b)	169. (d)
170. (a)	171. (c)	172. (c)	173. (b)	174. (c)	175. (d)	176. (b)	177. (a)	178. (b)	179. (c)	180. (b)	181. (c)	182. (c)
183. (c)	184. (c)	185. (d)	186. (c)									

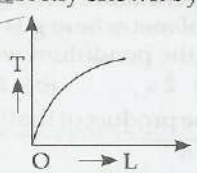
3. Wave Motion and Sound

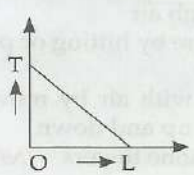
1. Mechanical waves
(a) are longitudinal only
(b) transverse only
(c) can be both longitudinal and transverse
(d) none of these

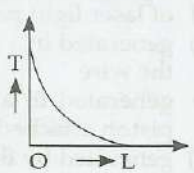
2. Transverse waves can propagate
(a) both in a gas and in a metal
(b) in a gas but not in a metal
(c) not in a gas but in a metal
(d) neither in a gas nor in a metal

3. Waves which do not require any material medium for its propagation is—
(a) Matter waves (b) Mechanical waves
(c) Elastic waves (d) Electromagnetic waves
[SSC (MTS) 2014]

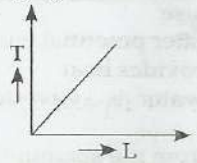
4. The graph between L and T is correctly shown by
(a) 

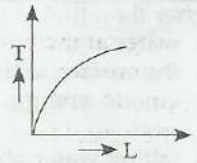
(b) 

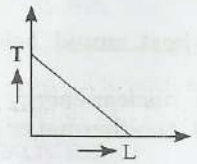
(c) 

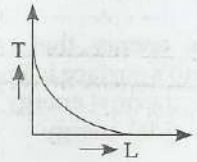
(d) 

5. The graph between L and T^2 is

(a) 

(b) 

(c) 

(d) 

6. The period of pendulum depends upon
(a) mass (b) length
(c) amplitude (d) energy

7. A pendulum suspended from the ceiling of a train has a time period T when the train is at rest. When the train is accelerating with a uniform acceleration, the time period will
(a) increase (b) decrease
(c) become infinite (d) remain unfaffected

8. The relation between T and g is given by
(a) $T \propto g$ (b) $T \propto g^2$ (c) $T^2 \propto g$ (d) $T \propto \sqrt{\frac{1}{g}}$

9. If a pendulum is allowed to oscillate into jar containing water, its time period will
(a) increase (b) decrease
(c) remain same (d) none of these

10. If the mass of the pendulum is doubled, the time period
(a) becomes double (b) becomes half
(c) becomes four times (d) remains same

11. When the bob is central position the forces are
(a) balanced (b) unbalanced
(c) sometimes balanced and sometimes unbalanced
(d) none of these

12. The phenomenon in which the amplitude of oscillation of pendulum decreases gradually is called
(a) decay period of oscillation
(b) damping
(c) building up oscillation (d) maintained oscillation

13. The length of the pendulum is doubled and the mass of its bob is halved. Its time period would
(a) become double (b) become half
(c) become $\sqrt{2}$ times (d) remain the same

14. A pendulum having period of oscillation of 2 s is taken on a planet where g is four times that on earth. The period of the pendulum would be
(a) 2 s (b) 1 s (c) 4 s (d) $2\sqrt{2}$ s

15. The product of the time period of a wave and its frequency is
(a) infinite (b) zero
(c) unity (d) None of these

16. Sound waves are similar to the waves
(a) of laser light passing through air
(b) generated in a stretched wire by hitting or plucking the wire
(c) generated in a pipe filled with air by moving the piston attached to the pipe up and down
(d) generated by the mobile phone towers *[NDA 2014]*

17. Which one among the following waves bats use to detect the obstacles in their flying path ?
(a) Infrared waves (b) Electromagnetic waves
(c) Ultrasonic waves (d) Radio waves *[NDA 2014]*

18. When a stone is thrown in the calm water of a pond the waves produced on the surface of water in the pond are—
(a) longitudinal (b) transverse
(c) both longitudinal and transverse
(d) waves are not produced *[SSC (LDC) 2013]*

19. Out of the following, which frequency is not clearly audible to the human ear ?
(a) 30 Hz (b) 30,000 Hz (c) 300 Hz (d) 3000 Hz

20. Stationary wave is formed by—
(a) a transverse wave superposing a Longitudinal wave
(b) Two waves of the same speed traveling
(c) Two waves of same forquency traveling in the same direction.
(d) Two waves of same frequency traveling in the oppsite direction *[SSC (CPU) 2014]*

21. Sound travel fastest in
(a) steel (b) air (c) water (d) vacuum

22. Ultrasonic waves are used for stirring liquid solutions because they
(a) do not produce noise during the operation
(b) are easy to produce
(c) can produce perfectly homogeneous solution
(d) do not produce chemical reactions in the solution

23. Ultrasonic waves are those waves which
(a) human beings cannot hear
(b) human beings can hear
(c) have high velocity (d) have large amplitude

24. Laplace's correction in the formula for the speed of sound given by newton was needed because sound waves
(a) are longitudinal
(b) propagate isothermally
(c) propagate adiabatically
(d) have long wavelengths

25. With the rise of temperature, the speed of sound in a gas
(a) increases (b) decreases
(c) remains the same (d) none of these

26. The temperature at which the speed of sound in air becomes double its value of 0° C is
(a) 1092° C (b) 189 K (c) 819° C (d) 546° C

27. Speed of sound in a gas is proportional to
(a) square root of isothermal elasticity
(b) square root of adiabatic elasticity
(c) isothermal elasticity (d) adiabatic elasticity

28. The velocity of sound in air is affected by change in the
(i) atmospheric pressure (ii) moisture content of air
(iii) temperature of air
(iv) composition of air
Choose the correct answer
(a) (i) and (ii) (b) (i), (iii) and (iv)
(c) (i), (ii) and (iii) (d) (ii), (iii) and (iv)

29. The speed of sound in air at S.T.P. is 300 m/s. If the air pressure becomes double, the temperature remaining the same, the speed of sound would
(a) 1200 m/s (b) 600 m/s
(c) 300 m/s (d) $300\sqrt{2}$ m/s

30. With the propagation of a longitudinal wave through a material medium, the quantities transferred in the direction of propagation are
(a) energy, momentum and mass
(b) energy and momentum
(c) energy and mass
(d) energy

31. If the amplitude of sound is doubled and the frequency reduced to one-fourth, the intensity will
(a) increase by a factor of 2
(b) decrease by a factor of 2
(c) decrease by a factor of 4
(d) remain unchanged

32. If the amplitude of a wave at a distance r from a point source is A, the amplitude at a distance 2r will be
(a) $2A$ (b) A (c) $A/2$ (d) $A/4$

33. When a source of sound is in motion towards a stationary observer, the effect observed is
(a) increase in the velocity of sound only
(b) decrease in the velocity of sound only
(c) increase in frequency of sound only
(d) increase in both the velocity and the frequency of sound

34. When an aeroplane attains a speed higher than the speed of sound in air a loud bang is heared. This is because
(a) it explodes
(b) its wings vibrate so violently that the bang is heard
(c) the normal engine noises undergo a doppler shift to generate the bang
(d) it produces a shock wave which is received as the bang

35. Ultrasonic waves can be detected by
(a) telephone (b) Hebb's method
(c) Kundt's the (d) Quincke's tube

36. The quality of sound produced by an instrument depends on the
(a) frequency (b) intensity
(c) number of overtones (d) none of these

37. The same notes being played on sitar and veena differ in
(a) quality (b) pitch
(c) both quality and pitch (d) none of these

38. Decibe is a
(a) musical note (b) musical instrument
(c) unit of intensity (d) unit of intensity

39. When a wave goes from one level to another, there is a change in the
(i) velocity (ii) amplitude
(iii) frequency (iv) wavelength
Choose the correct answer
(a) only (i) (b) (i), (ii)
(c) (i), (ii) and (iv) (d) all of them

40. To raise the pitch of stringed musical instrument the player can
(a) loosen the string (b) tighten the string
(c) shorten the string (d) Both (b) and (c)

41. How does the speed V of sound in air depend on atmospheric pressure P ?
(a) $V \propto P^{-1}$ (b) $V \propto P^2$
(c) $V \propto P^0$ (d) $V \propto P^{1/2}$

42. Instrument used to study the behaviour of a vibrating string is :
(a) Hygrometer (b) Sonometer
(c) Barometer (d) Hydrometer *[SSC 2013]*

43. Doppler shift in frequency does not depend upon
(a) the actual frequency of the wave
(b) the distance of the source from the listener
(c) the velocity of the source
(d) the velocity of the observer

44. If the density of oxygen is 16 times that of hydrogen, what will be the ration of the velocities of sound in them ?
(a) 1 : 4 (b) 4 : 1 (c) 2 : 1 (d) 1 : 16

45. Pitch of sound depends on
(a) frequency (b) wavelength
(c) amplitude (d) speed

46. Consider the following statements :
Assertion (A) : The velocity of sound in air increases due to the presence of moisture in it
Reason (R) : The presence of moisture in air lowers the density of air of these statements
(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 the correct explanation of A
(c) A is true but R is false
(d) A is false but R is true

47. 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) $\sqrt{\frac{p}{\gamma d}}$ (b) $\sqrt{\frac{d}{\gamma p}}$
(c) $\sqrt{\frac{\gamma d}{p}}$ (d) $\sqrt{\frac{\gamma p}{d}}$

48. The temperature at which the speed of sound in air becomes double of its value at 27° C is
(a) 54° C (b) 327° C
(c) 927° C (d) −123° C

49. If the pressure amplitude of a sound wave is tripled, then the intensity of the wave increases by a factor
(a) 3 (b) 6
(c) 9 (d) $\sqrt{3}$

50. The velocity of sound is generally greater in solids than in gases because
(a) the density of solids is high and the elasticity is low
(b) both the density and elasticity of solids. are very low
(c) the density of solids is low and the elasticity is high
(d) the elasticity of solids is very high

51. As a wave strikes against a wall
(a) its phase changes by 180°, but velocity does not change
(b) its phase does not change, but velocity change
(c) its velocity changes and phase too changes by 180°
(d) non of these

52. The Doppler's effect is applicable for
(a) light wave (b) sound wave
(c) space wave (d) both (a) and (b)

53. Which one of the following explains that all the galaxies are receding from us
(a) white dwarfs (b) neutrons stars
(c) black holes (d) red shift

54. If a sound travels from air to water, the quantity that remain unchanged is
(a) velocity (b) frequency
(c) wavelength (d) amplitude

55. Sound waves of wavelength greater than that of audible sound are called
(a) Infrasonic waves (b) ultrasonic wave
(c) sonic wave (d) seismic waves

56. If V_m is the velocity of sound in moist air and V_d is the velocity of sound in dry air then
(a) $V_m > V_d$ (b) $V_m < V_d$
(c) $V_m = V_d$ (d) none of these

57. The waves moving from a sitar to a listener in air are :
(a) longitudinal progressive
(b) longitudinal stationary
(c) transverse progressive
(d) transverse stationary

58. When we hear a sound, we can identify its source from
(a) wave length of sound
(b) the overtones present in the sound
(c) the intensity of sound
(d) the amplitude of sound

59. Velocity of sound in air
(i) increases with temperature
(ii) decreases with temperature
(iii) increase with pressure
(iv) is independent of pressure
(v) is independent of temperature
(a) only (i) and (ii) are true
(b) only (ii) and (iv) are true
(c) only (i) and (iii) are true
(d) only (i) and (iv) are true

60. Beats occur because of
(a) interference (b) reflection
(c) refraction (d) doppler effect

61. The types of waves produced in a sonometer wire are
(a) transverse progressive
(b) transverse stationary
(c) longitudinal progressive
(d) longitudinal stationary

62. With the increase in temperature, the frequency of the sound from an organ pipe
(a) decreases (b) increases
(c) remain unchanged (d) changes erractically

63. Stationary waves of frequency 300 Hz are formed in a medium in which the velocity of sound is 1200 m/s. The distance between a node and the neighbouring anti node is
(a) 1 m (b) 2 m (c) 3 m (d) 4 m

64. In a stationary longitudinal wave, nodes are points of
(a) maximum pressure (b) minimum pressure
(c) minimum pressure variation
(d) maximum pressure variation

65. When two sound waves are superimposed, beats are produced when they have
(a) different amplitudes and phases
(b) different velocities
(c) different phases (d) different frequencies

66. Two waves of the same frequency and intensity superimpose with each other in opposite phases. Then after superposition the
(a) intensity increases to four times
(b) intensity increases to two times
(c) frequency increases to four times
(d) none of the above

67. If the ratio of the amplitudes of two waves is 4 : 3, then the ratio of maximum and minimum intensity is
(a) 16 : 9 (b) 1 : 16 (c) 1 : 49 (d) 49 : 1

68. In a stationary wave along a string the strain is
(a) zero at nodes (b) maximum of nodes
(c) maximum at anti nodes (d) constant every where

69. If two waves of amplitude a produce a resultant wave of amplitude a, then the phase difference between the is
(a) 60º (b) 90º (c) 120º (d) 180º

70. If T is the reverberation time of an auditorium of volume V then
(a) $T \propto V$ (b) $T \propto \frac{1}{V}$ (c) $T \propto V^2$ (d) $T \propto \frac{1}{V^2}$

71. In a stationary wave all the particles of the medium
(a) cross the mean position with different velocities at different instants
(b) cross the mean position with different velocities at the same instant
(c) cross the mean position with same velocity
(d) cross the mean position with same speed

72. Stationary waves are so called because in them :
(a) the particles of the medium are not disturbed at all
(b) the particles of the medium do not execute SHM
(c) these occurs no flow of energy
(d) the interference effect can't be observed

73. Sound waves do not exhibit the phenomenon of
(a) interference (b) diffraction
(c) refraction (d) polarisation

74. Sound waves cannot be polarised because they
(a) require a material medium for propagation
(b) are longitudinal (c) are tranverse
(d) have low velocity

75. The velocity of sound in a gas depends on
(a) wavelength only
(b) density and elasticity of gas
(c) intensity only
(d) amplitude and frequency

76. Resonance is a special case of
(a) forced vibration (b) natural vibration
(c) damped vibration (d) none of these

77. Which does not show polarisation
(a) electromagnetic wave
(b) transverse wave in gas
(c) longitudinal wave in a gas
(d) none of these

78. Maximum value of the wavelength of ultrasonic waves is
(a) 33 cm (b) 1.65 cm (c) 1.65 m (d) 20 cm

79. Red shift in an illustration of
(a) low temperature emission
(b) high frequency absorption
(c) doppler effect
(d) unknown phenomenon

80. Quality of musical note depends on
(a) fundamental frequency
(b) harmonics present
(c) amplitude of the wave
(d) velocity of sound in medium

81. An empty vessel is partially filled with water. The frequency of vibration of air column in the vessel
(a) increases (b) decreases
(c) remains the same (d) none of these

82. When a stone is dropped on the surface of still water, the waves produced are
(a) transverse (b) longitudinal
(c) stationary
(d) partly longitudinal and partly transverse

83. There is no net transfer of energy by the particles of the medium in
(a) longitudinal waves (b) transverse waves
(c) progressive waves (d) stationary waves

84. The technique used to transmit audio signal in television broadcasts is–
(a) amplitude modulation
(b) frequency modulation
(c) pulse code modulation
(d) time division multiplexing *[IAS 1995]*

85. When the same note is played on a sitar and a flute, the sound produced can be distinguished from each other because of the difference in :
(a) pitch, loudness and quality
(b) pitch and loudness (c) quality only
(d) laudness only *[IAS 1995]*

86. When the frequency distribution is normal
(a) median, mode and onean are all different from one another
(b) mean, mode and median are identical
(c) mean is greater than mode
(d) mean is greater than median *[IAS 1996]*

87. A noise level of 100 decibel would correspond to:
(a) Just audible sound
(b) ordinary conversation
(c) sound from a noisy street
(d) noise from a machine shop *[IAS 2000]*

88. Which one of the following does TV remote control unit use to operate a TV set ?
(a) light waves (b) sound waves
(c) micro waves (d) radio waves *[IAS 2000]*

89. Which one of the following statements is not correct ?
(a) the velocity of sound in air increases with the increase of temperature
(b) the velocity of sound in air is independent of pressure
(c) the velocity of sound in air decreases as the humidity increases
(d) the velocity of sound in air is not affected by the change in amplitude and frequency *[IAS 2003]*

90. Consider the following statements :
(i) A geo-stationary satellite is at an approximate height of 10,000 km
(ii) FM transmission of music is a very good quality because the atmospheric or man made noises which are generally frequency variations can do little harm.
Which of the statements give above is/are correct ?
(a) 1 only (b) 2 only
(c) both 1 and 2 (d) Neither 1 nor 2 *[IAS 2005]*

91. The loudness of sound depends upon
(a) velocity (b) pitch
(c) amplitude (d) wavelength

92. In which one among the following is the speed of sound maximum ?
(a) air at 0° C (b) air at 100° C
(c) water (d) wood

93. Which of the following types is used by computed tomography employed for visualisation of the internal structure of human body ?
(a) X – rays (b) sound waves
(c) magnetic resonance (d) radio-isotopes *[IAS 2007]*

94. Consider the following statements :
(i) a flute of smaller length produces waves of lower frequency.
(ii) sound travels in rocks in the form of longitudinal elastic waves only.
Which of the statements given above is/are correct ?
(a) 1 only (b) 2 only
(c) both 1 and 2 (d) neither 1 nor 2 *[IAS 2007]*

95. Assertion (A) : Radio waves bend in a magnetic field
Reason (R) : Radio waves are electromagnetic in nature
Codes :
(a) A and R are individually true and R is the correct explanation of A
(b) A and R are individually true, but R is not the correct explanation of A
(c) A is true, but R is false
(d) A is false, but R is true *[IAS 2008]*

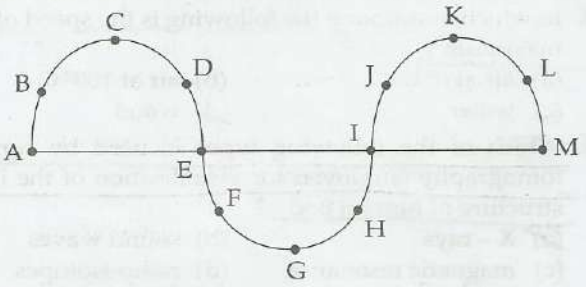
96. Pitch is sensation which depends upon
(a) frequency (b) amplitude
(c) wavelength (d) velocity

97. When light waves pass from air to glass, the variables affected are
(a) wavelength, frequency and velocity
(b) velocity and frequency
(c) wavelength and frequency
(d) wavelength and velocity *[IAS 2001]*

98. Consider the following statements
(i) light of longer wavelength is scattered much more than the light of shorter wavelength
(ii) The speed of visible light in water is 0.95 times the speed in vacuum
(iii) Radio waves are produced by rapidly oscillating electrical currents
(iv) To detect the overspeeding vehicles, police use the Doppler effect of reflected short radiowaves
Which of these statements are correct ?
(a) 1 and 2 (b) 1 and 3
(c) 2 and 4 (d) 3 and 4 *[IAS 2002]*

99. Which one of the following types of glass can cut of ultraviolet rays ?
(a) soda glass (b) pyrex glass
(c) jena glass (d) crookes glass
[IAS 2007]

100. Figure given shows the part of a long string in which.



waves are produced. Which pair of points is in same phase ?
(a) A and E (b) B and J
(c) D and J (d) C and G *[NDA 2006]*

101. Consider the following statements
(i) X-rays show transverse wave characteristics
(ii) X-rays can eject electrons from certain metal surfaces
(iii) X-rays of 0.1 Å are harder than X - rays of 0.2 Å.
Which of the statements given above is / are correct ?
(a) 1 only (b) 1 and 2 only
(c) 2 and 3 only (d) 1, 2 and 3

102. Why is sound heard with more intensity through CO_2 than through the air ?
(a) density of CO_2 is more than that of air
(b) density of CO_2 is less than that of air
(c) air is a bad conductor of heat
(d) CO_2 is a compound, but air is a mixture of gases.
[NDA 2006]

103. If V_1, V_2 and V_3 are the velocities of sound in steel, water and vacuum respectively, which one of the following relations is correct ?
(a) $V_1 < V_2 < V_3$
(b) $V_1 < V_2 + V_3$
(c) $V_1 = V_2 = V_3$
(d) $V_1 \cdot V_2 \cdot V_3 = 0$

104. A string 1m long is drawn by a vibrator attached to its end. The string vibrates in three segments. If the frequency of vibration of the vibrator is 480 Hz, then what is the speed of waves through the string ?
(a) 160 Hz (b) 320 Hz
(c) 480 Hz (d) 640 Hz

105. Match List-I (type of electromagnetic radiation) with List-II (corresponding wavelength) and select the correct answer using the code given below

List – I	List – II
(A) Radio waves	(1) $4 \times 10^{-7} - 7 \times 10^{-7}$ m
(B) Ultraviolet waves	(2) $10^{-11} - 10^{-9}$ m
(C) Visible light	(3) $10^{-6} - 10^{-3}$ m
(D) X-rays	(4) $10^{-3} - 10^{-5}$ m
	(5) $10^{-9} - 10^{-7}$ m

Code :	A	B	C	D
(a)	3	2	4	5
(b)	4	5	1	2
(c)	3	5	4	2
(d)	4	2	1	5

106. Consider the following statements with reference to X-rays
(1) They produce heat when absorbed by matter
(2) They are generated when fast moving electrons strik a metal target
(3) They can penetrate through a thin sheet of aluminum.
Which of the statements given above are correct ?
(a) 1, 2 and 3 (b) 1 and 2
(c) 2 and 3 (d) 1 and 3

107. What is the frequency of a wave whose time-period is 0.05 second ?
(a) 5 Hz (b) 10 H_2 (c) 20 H_2 (d) 40 H_2
[NDA 2003]

108. Consider the following statements
(1) Sound waves are elastic waves
(2) In sound waves, the vibrations are perpendicular to the direction in which the wave travels.
Which of these statement is / are correct ?
(a) 1 only (b) 2 only
(c) both 1 and 2 (d) neither 1 nor 2

109. The velocity of sound produced by a vibrating body varies –
(a) directly as the sq. root of density of the medium
(b) inversely as the density of the medium
(c) directly as the sq. root of frequency of the medium
(d) inversely as the frequency of the medium
[NDA 2003]

110. A particle is executing simple harmonic motion. Its total energy is proportional to its-
(a) displacement from equilibrium position
(b) frequency of oscillation
(c) square of amplitude of motion
(d) velocity at equilibrium position *[NDA 2002]*

111. A wave under goes reflection from a rigid boundary. One of its characteristic parameters that changes is–
(a) frequency (b) phase
(c) velocity (d) wavelength *[NDA 2002]*

112. X-rays are used for the study of crystal structure because
(a) X-rays are completely absorbed by the crystal
(b) The wavelength of X-rays is of the same order of magnitude as the interatomic spacing in crystals
(c) The wavelength of X-rays is very small in comparison with the interatomic spacing in crystals
(d) The crystals are completely transparent to X-rays
[NDA 2002]

113. A sound wave having wavelength λ forms stationary waves after reflection from a surface. The distance between two consecutive nodes is
(a) λ (b) $\frac{\lambda}{2}$ (c) $\frac{\lambda}{4}$ (d) $\frac{\lambda}{8}$
[NDA 2001]

114. The quality of a musical note depends upon
(a) its amplitude (b) its frequency
(c) the wave velocity (d) its harmonic content
[NDA 2001]

115. The velocities of sound in air and water are 336 m/sec and 1470 m/sec respectively. Two sources producing waves of wavelength 6 m and 7 m sounded togather will produce beats
(a) that can be heard in both the media
(b) that can be heard only in water and not in air
(c) that can be heard only in air and not in water
(d) that can not be heard in either media *[NDA 2000]*

116. The audible frequency range of a human ear is
(a) 20 hertz to 200 hertz (b) 2 hertz to 20 hertz
(c) 200 hertz to 2000 hertz (d) 20 hertz to 20000 hertz
[NDA 2009]

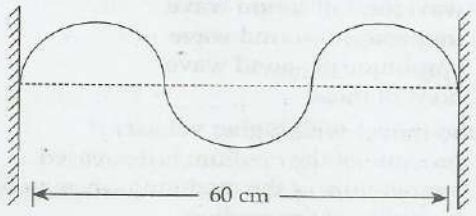
117. The wavelength of X-rays is of the order of
(a) 1 mm (b) 1 cm
(c) 1 micron (d) 1 angstrom *[NDA 2009]*

118. In vaccum, the speed of light
(a) depends on its wavelength
(b) depends on its frequency
(c) depends on its intensity
(d) neither depends on its wavelength, frequency nor intensity. *[NDA 2009]*

119. Consider the following parts of spectra
(1) visible (2) infrared
(3) ultraviolet (4) microwave
Which one of the following is the correct sequence in which their wavelength in crease ?
(a) 4 – 3 – 1 – 2 (b) 4 – 1 – 2 – 4
(c) 3 – 2 – 1 – 4 (d) 3 – 1 – 2 – 4

120. Which among the following in the necessary condition for simple harmonic motion ?
(a) constant period (b) constant accleration
(c) acceleration is proportional to the displacement from mean position and is always directed towards it
(d) displacement and torque are proportional
[NDA 2009]

121. The standing wave pattern along astring of length 60 cm is shown in the below diagram.



If the speed of the transverse waves on this string is 300 m/s, in which one of the following mades in the string vibrating ?
(a) fundamental (b) first overtone
(c) second overtone (d) third overtone
[NDA 2009]

122. A sonometer wire having a length of 50 cm is vibrating in the fundamental made with a frequency of 100 Hz. Which of the following is the type of propagating wave and its speed ?
(a) longitudinal, 50 m/s (b) transverse, 50 m/s
(c) longitudinal, 100 m/s (d) transverse, 100 m/s
[NDA 2009]

123. Some common mediums in which speed of sound waves is measured are mentioned below–
(1) air (2) steel (3) copper (4) water
What is the correct increasing order of the speed of sound ?
(a) 1 < 4 < 2 < 3 (b) 4 < 1 < 2 < 3
(c) 1 < 4 < 3 < 2 (d) 4 < 1 < 3 < 2
[NDA 2008]

124. How does time period (T) of a seconds pendulum very with length (l) ?
(a) $T \propto \sqrt{l}$ (b) $T \propto l^2$
(c) $T \propto l$ (d) T does not depend on l
[NDA 2007]

125. Which one of the following is the correct sequence of wavelengths of radiations ?
(a) UV > Green > IR > Hard X-rays
(b) IR > Green > UV > Hard X-rays
(c) UV > Hard X-rays > IR > Green
(d) IR > Hard X-rays > Green > UV *[NDA 2006]*

126. An echo will be heard if the minimum distance between the source of sound and obstacle is
(a) 1 m (b) 10 m (c) 15 m (d) 17 m

127. Echo is produced due to
(a) reflection of sound (b) refraction of sound
(c) resonance (d) none of these

128. The echo will be heard if the original sound reflected by an obstacle is
(a) 10 s (b) 0.50 s (c) 15 s (d) 0.1 s

129. SONAR is based on the principle of
(a) echo (b) resonance
(c) reverberation (d) none of these

130. Which of the following type of waves is different from others ?
(a) light waves (b) X–rays
(c) radio waves (d) sound waves

131. Quality is that sensation of sound which is felt by our ears by virtue of
(a) waveform of sound wave
(b) frequency of sound wave
(c) amplitude of sound wave
(d) none of these

132. Sound moves with higher velocity if
(a) pressure of the medium is decreased
(b) temperature of the medium is increased
(c) humidity of the medium
(d) both (b) and (c) *[NDA – 2010]*

133. Speed of electromagnetic wave is the same
(a) for all wavelengths (b) for all frequencies
(c) in all media (d) for all intensities

134. For television broadcasting, the frequency employed is normally
(a) 30 – 300 MHz (b) 30 – 300 GHz
(c) 30 – 300 kHz (d) 30 – 300 Hz

135. Which of the following electromagnetic radiations has the smallest wavelength
(a) microwaves (b) ultraviolet
(c) X-rays (d) Gama rays

136. Radio waves of constant amplitude can be generated with
(a) Filter (b) Rectifier
(c) FET (d) Oscillator

137. If V_g, V_n, and V_m, are the speeds of gamma rays, X-rays and microwaves respectively in vacuum, then
(a) $V_g < V_n < V_m$ (b) $V_g > V_n > V_m$
(c) $V_g = V_n = V_m$ (d) None of these

138. The wavelength of microwaves is
(a) smaller than the wavelength of violet light
(b) smaller than the wavelength of yellow light
(c) larger than the wavelength of red light
(d) larger than the wavelength of radio waves

139. Microwaves are electromagnetic waves with frequency, in the range of
(a) micro hertz (b) mega hertz
(c) giga hertz (d) hertz

140. An accelerated electron would produce
(a) α-rays (b) γ-rays
(c) β-rays (d) E.M. rays

141. Which of the following is the infrared wavelength ?
(a) 10^{-4} cm (b) 10^{-5} cm (c) 10^{-6} cm (d) 10^{-7}cm

142. The velocity of light in vacuum can be changed by changing
(a) frequency (b) amplitude
(c) wavelength (d) none of these

143. The frequencies of X-rays, γ-rays and ultraviolet rays are respectively *a*, *b* and *c* then
(a) $a < b, b > c$ (b) $a > b, b > c$
(c) $a > b, b < c$ (d) $a < b, b < c$

144. There are three wavelengths 10^7 m, 10^{-10} m, and 10^{-7} m. Find their respective names
(a) X-rays, Visible rays, Radio waves
(b) Radio waves, X-rays, Visible rays
(c) Visible rays, Radio wave, X-rays
(d) None of these

145. The velocity of light is maximum in
(a) diamond (b) water (c) vacuum (d) glass

146. Which of the following natural source of gamma-rays
(a) radio cobalt (b) radio phosphorus
(c) radon gas (d) radio carbon

147. Which of the following statements about electromagnetic wave is / are correct
(1) X-rays in vacuum travel faster than light waves in vacuum
(2) The energy of X-rays photon is greater than that of a light photon
(3) Light can be polarised but X-rays cannot
(a) 1 and 2 (b) 2 and 3 (c) 1, 2 and 3 (d) only 2

148. The ozone layer absorbs
(a) infrared radiation (b) ultraviolet radiation
(c) X-rays (d) γ-rays

149. Electromagnetic waves can travel through
(a) space where there are no electric and magnetic field.
(b) a medium such as air and water
(c) electric field or magnetic field
(d) both (a) and (b)

150. Which radiation emitted from the sun has highest wavelength ?
(a) γ-rays (b) ultraviolet
(c) red rays (d) micro waves

151. Which are the relevant waves in telecommunication ?
(a) X-rays (b) Violet-rays
(c) microwaves (d) all of them

152. Velocity of electromagnetic waves in a medium depends upon—
(a) thermal properties of medium
(b) mechanical and electrical properties of medium
(c) electrical and magnetic properties of medium
(d) None of these

153. Who firstly predicated the existence of electromagnetic waves ?
(a) Hertz (b) Maxwell (c) Marconi (d) Romar

154. Who discovered wireless communication ?
(a) Hertz (b) Maxwell (c) Marconi (d) Newton

155. For harder X-rays
(a) the wavelength is higher
(b) the intensity is higher
(c) the frequency is higher
(d) none of these

156. Who firstly demonstrated experimentally the existance of electromagnetic wave ?
(a) Heftz (b) Maxwell (c) Marconi (d) Newton

157. Match List-I (Electromagnetic wave) with List-II (Discoverer) and select the correct answer using the code given below

List	List II
(A) Infrared waves	1. W. Roentgen
(B) Ultrviolet rays	2. Newton
(C) X-rays	3. Herschell
(D) Visible rays	4. Ritter

Code :	A	B	C	D
(a)	1	2	3	4
(b)	3	4	1	2
(c)	3	4	2	1
(d)	4	3	1	2

158. What frequency range of E.M. waves are used for commercial FM radio
(a) 88 MHz to 108 MHz (b) 88 kHz to 108 kHz
(c) 88 GHz to 108 GHz (d) None of these

159. The patient is asked to drink barium sulphate ($BaSO_4$) for examining the stomach by X-rays because X-rays are :
(a) reflected by heavy atoms
(b) refracted by heavy atoms
(c) less absorbed by heavy atoms
(d) more absorbed by heavy atoms

160. X-rays are not used for radar purpose because
(a) they are not reflected by the target
(b) they are completely absorbed by air
(c) they are not electromagnetic wave
(d) None of these

161. Penetrating power of X-rays does not depend on :
(a) wavelength (b) energy
(c) potential difference (d) current in the filament

162. X-rays are heavily absorbed by lead atoms, but to obtain X-ray photograph of stomach barium sulphate is usually given to the potient instead of lead salt, because
(a) barium salts reflect less
(b) barium salts give brighter image
(c) lead salts are more poisonous
(d) lead salts give fainter image

163. X-rays absorption will be maximum for the sheets of
(a) silver (b) lead (c) copper (d) iron

164. Which one of the following is not electromagnetic in nature ?
(a) cathode rays (b) X-rays
(c) gamma-rays (d) Infrared rays
[NDA 2009]

165. Consider the following parts of spectra
1. visible 2. infrared
3. ultraviolet 4. microwave
Which one of the following is the correct sequence in which their wavelengths increase ?
(a) 4 - 3 - 1 - 2 (b) 4 - 1 - 2 - 3
(c) 3 - 2 - 1 - 4 (d) 3 - 1 - 2 - 4 *[NDA 2009]*

166. Consider the following statements :
1. X-rays show transverse wave characteristics
2. X-rays can eject electrons from certain metal surfaces
3. X-rays of 0.1 Å are harder than X-rays of 0.2 Å
Which of the statements given above is/are correct ?
(a) 1 only (b) 1 and 2 only
(c) 2 and 3 only (d) 1, 2 and 3 *[NDA 2006]*

167. Radar waves are sent towards a moving aeroplane and the reflected waves are received. When the aeroplane is moving towards the radar, the wavelength of the wave
(a) increases (b) decreases
(c) remains the same
(d) sometimes increases or decreases

168. The walls of the halls built for music concerts should
(a) amplify sound (b) reflect sound
(c) transmit sound (d) absorb sound

169. Match List-I (Electromagnetic radiation) with List-II (Approximate wavelength in metres) and select the correct answer using the code given below the lists —

List-I	List II
(A) Infrared radiation	1. 10^{-12}
(B) X-rays	2. 10^{-5}
(C) Ultraviolet radiation	3. 10^{-10}
(D) Gamma rays	4. 10^{-8}

Code :	A	B	C	D
(a)	2	3	4	1
(b)	1	4	3	2
(c)	1	3	4	2
(d)	2	4	3	1

[NDA 2009]

170. Learned indian classical vocalists do not like the accompaniment of a harmonium because
(a) tempered scale is used in the harmonium
(b) diatonic scale is used in the harmonium
(c) notes of the harmonium are too shrill
(d) intensity of the notes of the harmonium is too large

171. Which of the following is used in oven ?
(a) X-rays (b) UV-rays
(c) Microwaves (d) Radiowaves
[SS GL 2002]

172. Consider the following statements X-rays
1. can pass through thin sheets of aluminum
2. can be deflected by magnetic field
3. move with a velocity less than the velocity ultraviolet rays in vacuum
Which of the statement given above is/are correct ?
(a) 1, 2 and 3 (b) 1 only
(c) 2 and 3 only (d) 1 and 2 only
[CDS 2009]

173. Which one of the following has highest frequency ?
(a) cosmic rays (b) X-rays
(c) radiowaves (d) microwave *[CDS 2007]*

174. Which of the following electromagnetic waves has the longest wavelength ?
(a) infrared rays (b) gamma rays
(c) light rays (d) ultraviolet rays
[CDS 2007]

175. X-rays were discovered by —
(a) Roentgen (b) Becquere
(c) Curie (d) Van lane *[CDS 2007]*

176. Penetrating power of X-rays can be increased by
(a) increasing the potential difference
(b) decreasing the potential difference between anode and cathode
(c) decreasing the current of cathode filament
(d) increasing the current of cathode filament

177. Consider the following statement—
1. Microwaves are used in Radar system for air craft navigation
2. Microwave ovens are used for cooking purposes.
3. A radar using microwave can help in detecting the speed of tennis ball, cricket ball, automobile while in motion.

Which of the statements given above is/are correct ?
(a) 1 and 2 (b) 2 and 3
(c) 1 and 3 (d) 1, 2 and 3

178. Match List-I (frequency range) with List-II (Uses) and select the correct answer

List - I	List - II
(A) 54 MHz to 890 MHz	(i) UHF band
(B) 1710 kHz to 54 MHz	(ii) television waves
(C) 88 MHz to 108 MHz	(iii) short wave
(D) 300 MHz to 30,00 MHz	(iv) FM radio

Code :	A	B	C	D
(a)	(i)	(ii)	(iii)	(iv)
(b)	(ii)	(iii)	(iv)	(i)
(c)	(iv)	(iii)	(ii)	(i)
(d)	(iii)	(ii)	(i)	(iv)

179. An acoustically good hall should have
(a) adequate loudness only
(b) optimum reverberation only
(c) uniform distribution of sound only
(d) all the above three

180. Doppler effect is independent of
(a) velocity of source (b) velocity of listener
(c) distance between source and observer
(d) none of these *[IAS 2002]*

181. Consider the following electromagnetic waves
1. X-rays 2. γ-rays
3. microwaves 4. radio waves
What is the correct sequence in the order of their increasing energy ?
(a) 4, 3, 1 and 2 (b) 1, 3, 2 and 4
(c) 4, 2, 1 and 3 (d) 1, 4, 3 and 2 *[CDS 2001]*

182. A radar beam consists of
(a) X-rays (b) infrared rays
(c) ultraviolet-rays (d) microwaves

183. The waves used fo a communication through artificial satellite are
(a) microwaves
(b) radio waves in the AM bond
(c) radio waves in the FM band
(d) none of the above

184. The electromagnetic radiation most prevalent in the atmosphere is
(a) visible light (b) infrared
(c) ultraviolet (d) radio waves

185. In which of the following sequences are the electromagnetic radiations in decreasing order of wave lengths
(a) infrared, radio, X-rays, visible
(b) radio, infrared, visible, X-rays
(c) radio, visible, infrared, X-rays
(d) X-rays, visible, infrared, radio

186. The ionosphere is manily composed of
(a) nitrogen and oxygen
(b) ozone
(c) electrons and positive ions
(d) none of the above

187. The ozone layer absorbs radiation of wavelengths
(a) less than 3×10^{-5} m (b) more than 3×10^{-7} m
(c) less than 3×10^{-5} m (d) more than 3×10^{-5} m

188. The ozone layer absorbs
(a) infrared radiation (b) microwaves
(c) radio wave (d) ultraviolet rays

189. The ozone layer in the atmosphere is at a height of about
(a) 25 km (b) 50 km
(c) 100 km (d) 200 km

190. Polarization in electromagnetic wave is caused by
(a) reflection (b) refraction
(c) transverse nature of e.m. waves
(d) longitudinal nature of e.m. waves.

191. The ratio of the speed of X-rays to that of gamma rays
(a) is < 1 (b) is > 1
(c) is 1
(d) depends upon the ratio of their frequencies *[NDA 2010]*

192. Which one of the following pairs of rays is electromagnetic in nature
(a) β-rays and γ-rays
(b) cathode rays and X-rays
(c) α-rays and β-rays (d) X-rays and γ-rays *[NDA 2010]*

193. When X-rays are produced, then
(a) heat is produced on the target
(b) heat is observed by the target
(c) temperature of the target is being constant
(d) a lumineous light is to be seen on the target *[NDA 2010]*

194. Structure of solids is investigated by using
(a) cosmic rays (b) X-rays
(c) γ-rays (d) infrared radiation

195. X-rays are steams of
(a) electrons (b) photons
(c) protons (d) None of these

196. The rest mass of a photon is
(a) very small (b) very large
(c) zero (d) dependent on velocity

197. Frequency ranges for microwaves are
(a) $3 \times 10^9 - 3 \times 10^4$ (b) $3 \times 10^{13} - 3 \times 10^9$
(c) $3 \times 10^{14} - 3 \times 10^9$ (d) $3 \times 10^{11} - 3 \times 10^9$

198. The polarization of electromagnetic wave is in
(a) the direction of electric and magnetic field
(b) the direction of electric field
(c) the direction of magnetic field
(d) none of the above

199. Ultra violet light of sun's radiation is prevented from reaching the earth's atmosphere by the layer of
(a) oxygen (b) hydrogen
(c) ozone (d) helium *[SSC (LDC) 2011]*

200. Electromagnetic waves are produced by
(a) an accelerating charge
(b) a static charge
(c) chargeless particle
(d) a moving charge

201. Consider the following two statements regarding a linearly polarized plane electromagnetic wave
(1) the electric field and the magnetic field have equal average values
(2) the electric energy and magnetic energy have equal average values
(a) 1 is false but 2 is true (b) both 1 and 2 are true
(c) 2 is false but 1 is true (d) both 1 and 2 are false

Answers

1. (c)	2. (c)	3. (d)	4. (b)	5. (a)	6. (b)	7. (b)	8. (d)	9. (a)	10. (d)	11. (a)	12. (b)	13. (c)
14. (b)	15. (c)	16. (c)	17. (c)	18. (b)	19. (b)	20. (d)	21. (a)	22. (c)	23. (a)	24. (c)	25. (a)	26. (c)
27. (b)	28. (d)	29. (c)	30. (b)	31. (c)	32. (c)	33. (c)	34. (d)	35. (c)	36. (c)	37. (a)	38. (c)	39. (c)
40. (d)	41. (c)	42. (b)	43. (b)	44. (a)	45. (a)	46. (a)	47. (d)	48. (c)	49. (c)	50. (d)	51. (a)	52. (d)
53. (d)	54. (b)	55. (a)	56. (a)	57. (a)	58. (b)	59. (d)	60. (a)	61. (b)	62. (b)	63. (a)	64. (d)	65. (d)
66. (d)	67. (d)	68. (c)	69. (c)	70. (a)	71. (b)	72. (c)	73. (d)	74. (b)	75. (b)	76. (a)	77. (c)	78. (b)
79. (c)	80. (b)	81. (a)	82. (d)	83. (d)	84. (b)	85. (c)	86. (b)	87. (d)	88. (d)	89. (c)	90. (b)	91. (c)
92. (d)	93. (a)	94. (b)	95. (d)	96. (a)	97. (d)	98. (d)	99. (d)	100. (b)	101. (d)	102. (a)	103. (d)	104. (b)
105. (b)	106. (a)	107. (c)	108. (a)	109. (b)	110. (c)	111. (b)	112. (b)	113. (b)	114. (d)	115. (c)	116. (d)	117. (d)
118. (d)	119. (d)	120. (c)	121. (c)	122. (d)	123. (c)	124. (d)	125. (b)	126. (d)	127. (a)	128. (d)	129. (a)	130. (d)
131. (a)	132. (d)	133. (d)	134. (a)	135. (d)	136. (d)	137. (c)	138. (c)	139. (c)	140. (d)	141. (a)	142. (d)	143. (a)
144. (b)	145. (c)	146. (c)	147. (d)	148. (b)	149. (d)	150. (d)	151. (c)	152. (c)	153. (b)	154. (c)	155. (c)	156. (a)
157. (b)	158. (a)	159. (d)	160. (a)	161. (d)	162. (c)	163. (b)	164. (a)	165. (d)	166. (d)	167. (b)	168. (d)	169. (a)
170. (a)	171. (c)	172. (b)	173. (a)	174. (a)	175. (a)	176. (a)	177. (d)	178. (b)	179. (d)	180. (c)	181. (a)	182. (d)
183. (a)	184. (b)	185. (b)	186. (c)	187. (a)	188. (d)	189. (b)	190. (c)	191. (c)	192. (d)	193. (c)	194. (b)	195. (b)
196. (c)	197. (d)	198. (b)	199. (c)	200. (a)	201. (b)							

4. Light

1. According to the modern theory for nature of light, the light has
   (a) wave nature only
   (b) particle nature only
   (c) both wave and particle (dual) nature
   (d) neither particle nature nor wave nature

2. The wavelength of visible light are between
   (a) 3000 μm to 0.4 μm
   (b) 0.4 μm to 0.7 μm
   (c) 0.7 μm to 1000 μm
   (d) 0.1 cm to 30 cm

3. Velocity of light is maximum in
   (a) diamond (b) water
   (c) glass (d) vacuum

4. In vacuum the speed of light depends upon :
   (a) frequency (b) wavelength
   (c) velocity of the source of light
   (d) none of these

5. If V_c is the speed of light in vacuum and V_m is the speed of light in given medium then the refractive index of medium is
   (a) V_m/V_c (b) V_c/V_m
   (c) $V_m \times V_c$ (d) none of these

6. A ray of light travelling obliquely from denser to rarer medium
   (a) bends towards the normal
   (b) bends away from the normal
   (c) does deviate from its path
   (d) none of these

7. The laws of reflection are true for
   (a) the plane mirror only
   (b) the concave mirror only
   (c) the convex mirror only
   (d) all reflecting surfaces

8. The focal length of a plane mirror is
   (a) positive (b) negative (c) zero (d) infinity

9. A ray of light incident on a plane mirror at angle θ. If the angle between the incident and reflected rays is 80º, what is the value of θ
   (a) 40º (b) 50º (c) 45º (d) 55º

10. If a ray of light incident on a plane mirror is such that it makes an angle of 30º with the mirror, then the angle of reflection is
    (a) 30º (b) 45º (c) 55º (d) 60º

11. A boy is standing infront of a plane mirror at a distance of 3 m from it. What is the distance between the boy and his image
    (a) 3 m (b) 6 m (c) 4.5 m (d) none

12. The amount of light reflected depends upon
    (a) the nature of material of the object
    (b) the nature of the surface
    (c) the smoothness of the surface
    (d) all the above are correct

13. An observer moves towards a plane mirror with a speed of 2 m/s. The speed of the image with respect to the observer is
    (a) 1 m/s (b) 2 m/s (c) 4 m/s (d) 8 m/s

14. A plane mirror reflects a beam of light to form a real image. The incident beam is
    (a) parallel (b) convergent
    (c) divergent (d) any one of the above

15. A man of height 1.4 m wishes to see his full image in a plane mirror placed at distance of 2 m. The minimum height of the mirror should be
    (a) 0.5 m (b) 0.7 m (c) 0.9 m (d) none

16. A toy is placed between two plane mirror inclined at angle of 60º. The number of images formed is
    (a) 5 (b) 6 (c) 4 (d) 3

17. An object is placed between two parallel mirrors. The number of images formed is
(a) 4 (b) 6 (c) 8 (d) infinity

18. Two plane mirrors are placed perpendicular to each other. A ray strikes one mirror and after reflection falls on the second mirror. The ray after reflection from the second mirror will be
(a) perpendicular to the original ray
(b) parallel to the original ray
(c) at 45° to the original ray
(d) none of these

19. Two plane mirrors are inclined at a certain angle. A ray of light coming parallel to one of the mirrors is rendered parallel to the second mirror after two reflections. The inclination between the mirror is
(a) 60° (b) 90° (c) 45° (d) 30°

20. Two plane mirrors are inclined at 70°. A ray incident on one mirror at angle θ. After reflection, falls on the second mirror and is reflected from there parallel to the first mirror θ is
(a) 50° (b) 45° (c) 30° (d) 55°

21. A number of images of a candle flame are seen in thick mirror
(a) the first image is the brightest
(b) the second image is the brightest
(c) the last image is the brightest
(d) all images are equally brightest

22. The image of our face in a plane mirror
(a) real (b) magnified
(c) diminished (d) none of these

23. The nature of image formed by a plane mirror is
(a) virtual and erect
(b) of the same size as the object
(c) laterally inverted
(d) all the above are correct

24. When a ray or light enters a glass slab from air
(a) its wavelength decreases
(b) its wavelength increases
(c) its frequency increases
(d) neither its wavelength nor its frequency changes.

25. When light passes from one medium to another, the physical quantity that remains unchanged is
(a) velocity (b) wavelength
(c) frequency (d) none

26. A monochromatic beam of light passes from a denser to a rarer medium as a result its
(a) velocity increases (b) velocity decreases
(c) frequency decreases (d) wave length decreases

27. A well cut diamond appears bright because
(a) it emits light (b) it is radioactive
(c) of total reflection (d) of disperson

28. The refractive index of a given piece of transparent quartz is greatest for
(a) red light (b) violet light
(c) green light (d) yellow light

29. Total internal reflection can occur when light tends to pass from
(a) a denser to a rarer medium
(b) a rarer to a denser medium
(c) one medium to another of equal refractive index
(d) none of these

30. Mirage is observed in a desert due to the phenomenon of
(a) interference (b) total reflection
(c) scattering (d) double refraction

31. Critical angle of light passing from glass to water is minimum for
(a) red colour (b) green colour
(c) yellow colour (d) violet colour

32. Glass has refractive index $\frac{3}{2}$ and water has refractive index $\frac{4}{3}$. If the speed of light in glass is 2.00×10^8 m/s, the speed of light in water in m/s is
(a) 1.5×10^8 (b) 1.78×10^8
(c) 2.25×10^8 (d) 2.67×10^8

33. A diver in a lake wants to signal his distress to a person sitting on the edge of the lake flashing his water proof torch. He should direct the beam
(a) vertically upwards (b) horizontally
(c) at an angle to the vertical which is slightly less than critical angle.
(d) at an angle to the vertical which is slightly more than critical angle.

34. A ray of light travelling inside a rectangular glass of block of refractive index $\sqrt{2}$ is incident on the glass air surface at an angle of incidence of 45°. The refractive index of air is 1. The ray will
(a) emerge into air without any deviation
(b) be reflected back in to glass
(c) be absorbed
(d) emerge in to air with an angle of refraction equal to 90°.

35. When a ray of light is refracted by a prism such that the angle of deviation is minimum then
(a) the angle of emergence is equal to the angle of incidence
(b) the angle of emergence is greater than the angle of incidence
(c) the angle of emergence is smaller than the angle of incidence
(d) the sum of the angle of incidence and the angle of emergence is equal to 90°.

36. A virtual image larger than the object can be formed by a
(a) concave mirror (b) convex mirror
(c) convex lens (d) concave lens

37. Which of the following produce a virtual image smaller in size than the object ?
(a) concave lens (b) convex mirror
(c) concave mirror (d) both (a) and (b)

38. To an observer on the earth the stars appear to twinkle. This can be described to
(a) the fact that stars do not emit light continuously own atmosphere
(b) frequent absorption of star light by earth's atmosphere

(c) frequent absorption of star light by their own atmosphere
(d) the refractive index fluctuations in earth's atmosphere.

39. For an astronaut in a space ship, the sky appears
(a) black (b) white
(c) green (d) blue

40. One cannot see through fog because
(a) fog absorbs light
(b) the refractive index of fog is infinity
(c) light suffers total reflection at the droplets in fog
(d) light is scattered by the droplets in fog

41. If there were no atmosphere, the length of the day on the earth will
(a) decrease (b) increase
(c) remain the same (d) none of these

42. Check the wrong statement (s)
(a) a concave mirror can give a virtual image
(b) a concave mirror can give a diminished virtual image
(c) a convex mirror can give a diminished virtual image
(d) all of them

43. a concave mirror forms the image of an object on a screen. If the lower half of the mirror is covered with an opaque card, the effect would be
(a) to make the image less bright
(b) to make the lower half of the image disappear
(c) to make the upper half of the image disappear
(d) to make the image blurred

44. An object is placed 10 cm in front of a convex mirror of focal length 20 cm. The distance of the image from the mirror is
(a) 10/3 cm (b) 20/3 cm
(c) 10 cm (d) 40/3 cm

45. A convex mirror is used to form an image of a real object. The image
(a) always lies between the pole and the focus
(b) is diminished in size
(c) is erect
(d) all of the above

46. The power of lens is 4 diopters at focal length is
(a) 20 cm (b) 25 cm (c) 50 cm (d) 400 cm

47. The focal length of a convex lens is 50 cm. Its power is
(a) + 50 D (b) – 50 D (c) + 2 D (d) – 2 D

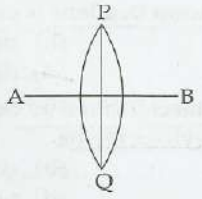
48. Which of the following produce a virtual image longer in size than the object ?
(a) concave lens (b) convex lens
(c) concave mirror (d) (b) and (c) both

49. A convex lens of glass has power P in air. If it is imersed in water, its power will be
(a) more than P (b) less than P
(c) P (d) none of these

50. A convex lens made of a material of refractive index 1.5 and having a focal length of 10 cm is immersed in a liquid of refractive index 3.0. The lens will be have as a
(a) converging lens of focal length 10 cm
(b) diverging lens of focal length 10 cm
(c) diverging lens of focal length 30 cm
(d) none of these

51. A real image is formed by a convex lens. If we put a concave lens in contact with it, the combination again forms a real image. The new image
(a) is closer to the lens system
(b) is farther from the lens system
(c) is at the original position
(d) none of these

52. The figure shows an equiconvex lens of focal length f. If the lens is cut along PQ, the focal length of each half will be



(a) $f/2$ (b) f (c) $2f$ (d) $4f$

53. If f_b and f_g are the focal lengths of a convex lens for blue and red lights respectively and F_b and F_r are the respective value for a concave lens, then
(a) $f_b > f_r$ and $f_b > f_r$ (b) $f_b < f_r$ and $f_b < f_r$
(c) $f_b > f_r$ and $f_b < f_r$ (d) none of these

54. The least distance of distinct vision is 25 cm. the focal length of a convex lens is 5 cm. It can act as simple microscope of magnifying power
(a) 4 (b) 5
(c) 6 (d) none of these

55. A compound microscope has a magnification of 30. The focal length of eye piece is 5 cm. If the final image is formed at the least distance of distinct vision (25 cm) the magnification produced by the objective is
(a) 5 (b) 7.5
(c) 10 (d) none of these

56. A person can not see clearly objects at a distance less than 100 cm. The power of the spectacles required to see clearly objects at 25 cm is
(a) + 1 D (b) + 3 D
(c) + 4 D (d) + 2 D

57. Myopia is due to
(a) shortening of eye ball
(b) irregular changes in the focal length of the eye lens
(c) older age (d) elongation of eye ball

58. In the case of hypermetropia
(a) the image of a near object is formed behind the retina
(b) the image of a distinct object is formed in front of the retina
(c) a concave lens should be used for correction
(d) a cylindrical lens should be used for correction

59. Astigmatism for a human eye can be removed by using
(a) concave lens (b) convex lens
(c) cylindrical lens (d) prismatic lens

60. Spherical aberration in a thin lens can be reduced by
(a) using a monochromatic light
(b) using a doublet combination
(c) using a circular annular mark over the lens
(d) increasing the size of the lens

61. When a ray of light enters a water filled glass tank from a glass face making a non zero angle to the normal, the emergent ray from the apposite face will follow a path which is
(a) same (b) deflected to the right
(c) deflected to the left (d) parallel but not same

62. A red flower kept in green light will apear
(a) red (b) green
(c) white (d) black

63. Chromatic aberration in a lens is caused by
(a) reflection (b) interference
(c) diffraction (d) dispersion

64. The image of an object formed by device is always virtual and small. The device may be
(a) convex lens (b) concave mirror
(c) concave lens (d) none of these

65. A light wave enters from air into a medium of refractive index 1.5. The speed of light in the medium will be
(a) 2×10^8 m/s (b) 4.5×10^8 m/s
(c) 3×10^8 m/s (d) none of these

66. A boy stands straight in front of a mirror at distance of 30 cm from it. He sees his erect image whose height is 1/5 of his real height. The mirror he is using is
(a) plane (b) convex
(c) concave (d) none

67. As an object gets closer to the focal point of a converging lens from infinity, its image
(a) becomes smaller
(b) remains of the same size
(c) gets farther from the lens
(d) gets closer to the lens

68. Image formal by a convex spherical mirror is
(a) virtual (b) real
(c) enlarged (d) inverted

69. The path of a refracted ray of light in a prism is parallel to the base of the prism only when the
(a) light of a particular wavelength
(b) ray is incident normally at one face
(c) ray under goes minimum deviation
(d) none of these

70. If the top half of a convex lens is is covered with black paper
(a) the bottom half of the image will disappear
(b) the top half of the image will disappear
(c) the magnification will reduced to half
(d) the intensity will be reduced to half

71. The refractive index of a piece of transparent quartz is the greatest for
(a) red light (b) yellow light
(c) green light (d) violet light

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

73. Air bubble in water behaves as a
(a) divergent lens (b) convergent lens
(c) plane glass (d) none of these

74. Plane mirrors A and B are kept at angle θ with respect to each other. Light falls on A is reflected then falls on B and is reflected. The emergent ray is opposite to the incident direction. The angle θ is equal to
(a) 30º (b) 45º (c) 60º (d) 90º

75. Which one of the following phenomena is used in optical fibres
(a) scattering (b) successive reflections
(c) refraction (d) total internal reflection

76. When a ray of light emerges from a block of glass, the critical angle is
(a) equal to the angle of reflection
(b) the angle between the reflected ray and the normal
(c) the angle of incidence for which the refracted ray travels along the glass air boundary
(d) the angle of incidence

77. Focal length of a convex lens is maximum for
(a) blue light (b) yellow light
(c) green light (d) red light

78. The magnifying power of a compound microscope is
(a) objective magnification/eye piece magnification
(b) eyepiece magnification × objective magnification
(c) eyepiece magnification/objective magnification
(d) objective magnification + eyepiece magnification

79. The human eye has a lens which has a
(a) soft portion at its centre
(b) hard surface
(c) varying refractive index
(d) constant refractive index

80. When light enters from air to water, then its
(a) frequency increases and speed decreases
(b) frequency is same but the wavelength is smaller in water than in air
(c) frequency is same but the wavelength is larger in water than in air
(d) frequency and wavelength both decreases.

81. Total internal reflection of light is possible when light enters from
(a) air to glass (b) vacuum to air
(c) air to water (d) water to air

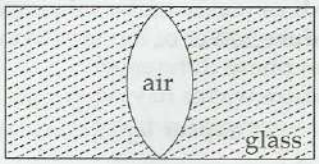
82. To have larger magnification by a telescope
(a) the objective should be of large focal length and the eyepiece should be of small focal length
(b) both the objective and eyepiece should be of small focal length
(c) both the objective and the eyepiece should be large focal length
(d) none of these

83. How many image will be formed if two mirror are fitted adjacent walls and one mirror on ceilling
(a) 5 (b) 7 (c) 11 (d) 2

84. If the refractive angle of a prism is 60º and the minimum deviation is 30º, then the angle of incidence is
(a) 30º (b) 60º (c) 45º (d) 90º

85. Critical angle is minimum when a light ray passes from
(a) air to glass (b) glass to air
(c) glass to water (d) water to glass

86. In the figure, an air lens is cut in a cylinder of glass of refractive index 1.5. The nature of the lens is



(a) diverging (b) converging
(c) neither diverging nor converging
(d) none of these

87. Line spectrum contains information about
(a) the atoms of the prism
(b) the atoms of the source
(c) the molecules of the source
(d) none of these

88. If the central portion of a convex lens is wrapped in black paper as shown in the figure

(a) no image will be formed by the remaining portion of the lens
(b) full image will be formed, but it will be less bright
(c) the central portion of the image will be missing
(d) none of these

89. All of the following statements are correct except
(a) the magnification produced by a convex mirror is always less than one
(b) a virtual, erect, same sized, image can be obtained using a plane mirror.
(c) a virtual, erect magnified image can be formed using a concave mirror
(d) a real, inverted, same sized image can be formed using a convex mirror

90. When seen in green light, the saffron and green portions of our national flag will appear as
(a) black
(b) black and green respectively
(c) green
(d) green and yellow respectively

91. The function of the collimator in a spectrometer is
(a) to decrease the intensity of light
(b) to increase the intensity of light
(c) to obtain a parallel beam of light
(d) to obtain larger dispersion

92. Which of the following form (s) a virtual and erect image for all position of the object
(a) convex lens (b) concave lens
(c) convex mirror (d) both (b) and (c)

93. The focal length of the converging lens is measured for violet, green and red colours. It is respectively f_v, f_g, f_r. We will find that
(a) $f_y = f_r$ (b) $f_v > f_r$ (c) $f_v < f_r$ (d) $f_g > f_r$

94. Spectrum of the sun consists of
(a) bright lines (b) dark lines
(c) bright bands (d) dark bands

95. Which one among the following colours has the highest wavelength ?
(a) Violet (b) Green
(c) Yellow (d) Red *[CDS 2013]*

96. The plane surface of plano-convex lens of focal length f is silvered. It will behave as a
(a) plane mirror
(b) convex mirror of focal length $2f$
(c) concave mirror of focal length $f/2$
(d) none of these

97. Two thin lenses of focal lengths. f_1 and f_2 are placed in contact. The focal length of the composite lens will be
(a) $\frac{f_1 + f_2}{2}$ (b) $\frac{f_1 + f_2}{f_1 f_2}$ (c) $\sqrt{f_1 f_1}$ (d) $\frac{f_1 f_2}{f_1 + f_2}$

98. An object is placed at a distance of 40 cm in front of a concave mirror of focal length 20 cm the image produced is
(a) virtual and inverted (b) real and erect
(c) real, inverted and diminished
(d) real, inverted and of the same size as the object

99. Line spectrum is given by
(a) sun (b) mecury vapour lamp
(c) candle (d) electric bulb

100. Splitting of white light into seven colurs is due to
(a) diffraction (b) refraction
(c) interference (d) reflection

101. In a compound microscope, the intermediate image is
(a) virtual, erect and magnified
(b) real, erect and magnified
(c) real, inverted and magnified
(d) virtual, erect and reduced

102. Rainbow is formed due to a combination of
(a) dispersion and total internal reflection
(b) refraction and absorption
(c) dispersion and focussing
(d) refraction and scattering

103. The nature of sun's spectrum is
(a) continuous spectrum with absorption lines
(b) line emission
(c) the spectrum of the Helium atom
(d) continuous spectrum

104. Which of the following is ***not*** caused by atmospheric refraction of light ?
(a) Sun appearing higher in the sky than it actually is
(b) Sun becoming visible two or three minutes before actual sunrise
(c) Sun appearing red at sunset
(d) Twinkling of stars at night *[SSC (LDC) 2013]*

105. The magnifying power of a compound microscope increases when ;
(a) the focal length of objective lens is increased and that of eye lens is decreased
(b) the focal length of eye lens is increased and that of objective lens is decreased
(c) focal lengths of both objective and eye piece are increased
(d) focal lengths of both objective and eye piece are decreased.

106. Angular separation between two colours of the spectrum depends upon
(a) angle of deviation (b) angle of incidence
(c) size of the prism (d) all of the above

107. Blue colour of the sky is consequence of
(a) reflection (b) refraction
(c) scattering (d) dispersion

108. Young's experiment established that
(a) light consists of waves (b) light consists of particle
(c) light is neither particle nor wave
(d) light is both particle and wave

109. To obtain a sustained interference pattern, we require two sources which emit radiation of
(a) the same frequency
(b) nearly the same frequency
(c) the same frequency and have a definite phase relationship
(d) different wavelengths

110. Colours of thin films are due to
(a) dispersion of light (b) interference of light
(c) absorption of light (d) scattering of light

111. When viewed in white light, soap bubbles show colours because of
(a) interference (b) scattering
(c) diffraction (d) dispersion

112. The phenomenon of interference is shown by
(a) longitudinal mechanical waves only
(b) transverse mechanical waves only
(c) non-mechanical transverse waves only
(d) all the above types of wave

113. The transverse nature of light is shown by
(a) interference of light (b) refraction of light
(c) polarization of light (d) dispersion of light

114. Which mirror is to be used to obtain a parallel beam of light from a small lamp ?
(a) plane mirror (b) convex mirror
(c) concave mirror (d) any one of these

115. Longitudinal waves do not exhibit
(a) refraction (b) reflection
(c) diffraction (d) polarization

116. Which of the following cannot be polarized
(a) radio wave (b) X-ray
(c) sound wave in air (d) infrared radiation

117. Optically active substances are those substances which
(a) produce polarized light
(b) rotate the plane of polarization of polarized light
(c) produce double refraction
(d) convert a plane polarized light into circularly polarized light

118. Laser light is considered to be coherent because it consists of
(a) many wavelengths
(b) uncoordinated wavelengths
(c) coordinated waves of exactly the same wave length
(d) divergent beams

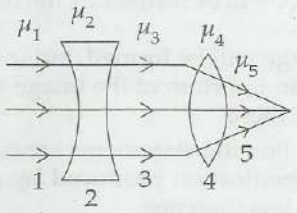
119. In the interference pattern, energy is
(a) created at the positions of maxima
(b) destroyed at the position of minima
(c) conserved but is redistributed
(d) not conserved

120. Two sources of wave are called coherent if
(a) both have the same amplitude of vibration
(b) both produce waves of the same wavelength
(c) both produce waves of the same wavelength having a constant phase difference
(d) both produce waves having the same velocity

121. Why does a tower appear larger and larger to a person approaching it ?
(1) The angle subtended by the tower at the eye increases.
(2) The focal length of Eye lens increases
(3) The size of the image of the retina of eye increases.
Select the correct answer using the code given above :
(a) 1 only (b) 3 only
(c) 1 and 3 only (d) 1, 2 and 3 *[NDA – 2006]*

122. Two plane mirrors are inclined at an angle θ to one another. A ray of light incident on the first mirror and parallel to the second mirror is reflected from the second mirror parallel to the first mirror.
What is the value of θ ?
(a) 0º (b) 45º (c) 60º (d) 90º
[NDA – 2006]

123. In the figure shown $\mu_1, \mu_2, \mu_3, \mu_4$, and μ_5 are the refractive indices.



of the mediums 1, 2, 3, 4 and 5 respectively. Consider the following :
(1) $\mu_1 = \mu_2$ (2) $\mu_3 = \mu_4 = \mu_5$
(3) $\mu_2 < \mu_3$ (4) $\mu_4 > \mu_5$
(a) 1 and 2 only (b) 1, 2 and 3 only
(c) 1 and 3 only (d) 3 and 4 only
[NDA – 2006]

124. Which one of the following statements is correct ?
In an astronomical telescope of refracting type.
(a) the objective and the eyepiece have the same focal length
(b) the focal length of the objective is less than that of the eyepiece
(c) the focal length of the objective is more than that of the eyepiece
(d) the aperture of the eyepiece is more than that of the objective

125. The refractive index of a medium is $\sqrt{3}$. Which one of the following is correct ?
(a) the sine of angle of incidence is $\sqrt{3}$ times the sine of angles of refraction
(b) the angle of incidence is twice the angle of refraction
(c) the sine of angle of refraction is $\sqrt{3}$ times the sine of angle of incidence.
(d) the angle of refraction is twice the angle of incidence.
[NDA – 2005]

126. An explosion takes place on the surface of moon. An astronaut at some distance from the site of explosion will
(a) observe light and hear sound caused by the explosion
(b) observe light but not hear sound caused by the explosion
(c) hear sound but not observe light caused by the explosion
(d) neither hear sound nor observe light caused by the explosion.

127.

V	I
G	B

A convex lens is used to form a real image of an object shown in the figure above. The object is coated with four different colours, violet (V), Indigo (Z) ; Blue (B) and Green (G)
Which one of the following represents the image of the object ?

(a)

V	I
G	B

(b)

I	V
B	G

(c)

B	G
I	V

(d)

G	B
V	I

[NDA 2005]

128. The angle of elevation of a cloud is 30º. A thunder is heard 4 seconds after the lightening is observed. What is the vertical height of the cloud (speed of sound is 330 m/s)
(a) 330 m (b) 660 m
(c) $660\sqrt{3}$ m (d) 1320 m *[NDA 2005]*

129. In the human eye, the focussing is done by
(a) to and fro movement of the eye lens
(b) to and fro movement of the retina
(c) change in the convexity of the eye lens.
(d) change in the refrective index of the eye fluids.
[NDA 2004]

130. Two plane mirrors *A* and *B* are placed at a distance 12 cm apart facing towards each other. An object is placed in between them at a distance 8 cm from the mirror *A*. What will be the distance between them at a distance 8 cm from the mirror *A*. What will be the distance between the first two images, formed in the mirror *B* ?
(a) 4 cm (b) 8 cm (c) 16 cm (d) 20 cm
[NDA 2004]

131. The focal length of the lens in a photographic camera is 5 cm. What is the power of the lens ?
(a) + 5 D (b) + 10 D (c) + 15 D (d) + 20 D
[NDA 2003]

132. The image formed on the retina of a human eye is
(a) virtual and inverted (b) virtual and erect
(c) real and erect (d) real and inverted
[NDA 2003]

133. A lens, immersed in a liquid becomes in visible when
(a) the focal length of the lens is zero
(b) the focal length of the lens is infinite
(c) the refractive index of the lens is less than the refractive index of the liquid
(d) the refractive index of the lens is equal to the refractive index of the liquid *[NDA 2003]*

134. An equiconvex lens is prepared from a glass of refractive index 1.5. The radius of curvature of the surface is 0.5 m. The focal length of the lens is
(a) 0.5 m (b) 1.0 m (c) 1.5 m (d) 2.0 m
[NDA 2002]

135. A light wave travelling in a transparent homogeneous medium enters another homogeneous transparent medium of higher refractive index. The speed of light in the second medium
(a) is less than that in the first medium
(b) is more than that in the first medium
(c) is the same as that in the first medium
(d) may be more or less than that in the first medium depending on the angle of incidence *[NDA 2002]*

136. In a healthy human eye, the focussing is done by the
(a) to and fro movement of the eye lens
(b) changing curvature of the retina
(c) change in the convexity of the lens through ciliary muscles
(d) change in the refractive index of the eye fluid
[NDA 2001]

137. Consider the following statements
(1) compound microscope has and objective lens with a very short focal length
(2) simple microscope consists of a strong converging lens system
(3) television camera convents the optical images into electrical video signals
(4) Hypermetropia is corrected by using a diverging lens. Which of these statement is/are correct ?
(a) 4 only (b) 2 and 3
(c) 1, 2 and 3 (d) 1, 2, 3 and 4 *[NDA 2001]*

138. Two plane mirrors are inclined at an angle of 60º to each other. If an object is placed between them, the number of images produced will be –
(a) 0 (b) 5 (c) 4 (d) 10
[NDA 2000]

139. The magnifying power of a telescope can be increased by–
(a) reducing the focal length of the eye piece
(b) increasing the diameter of the objective
(c) reducing the focal length of the objective
(d) increasing the diameter of the eyepiece *[NDA 2000]*

140. An object is kept 5 cm in front of a concave mirror of focal length 15 cm. What will be the nature of the image ?
(a) virtual, not magnified (b) virtual, magnified
(c) real not magnified (d) real, magnified
[NDA 2009]

141. Different objects at different distances are seen by the eye. The parameter that remains. Constant is–
(a) the focal length of the eye lens
(b) the object distance from the eye lens
(c) the radii of curvature of the eye lens
(d) the image distance from the eye lens *[NDA 2009]*

142. How far must a girl stand in front of a concave spherical mirror of radius 120 cm to see an erect image of her face four times its natural size ?
(a) 40 cm from the mirror (b) 45 cm from the mirror
(c) 50 cm from the mirror (d) 55 cm from the mirror
[NDA 2009]

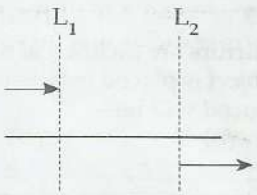
143. In a simple microscope, the lens in held at a distance d from the eye and the image is formed at the least distance (D) of distinct vision from the eye. What is the magnifying power of the microscope ?
(a) D/f (b) $1 + (D/f)$
(c) $1 + \{(D - d)/f\}$ (d) $1 + \{(D + d)/f\}$
[NDA 2008]

144. A far-sighted person has a near point at 100 cm. What must be the power of the correcting lens ?
(a) $-0.8\ D$ (b) $-3.0\ D$
(c) $+0.8\ D$ (d) $+3.0\ D$ *[NDA 2008]*

145. Consider the following statements–
(1) The focal length of the objective of a microscope is less than the focal length of the eyepiece
(2) The minimum distance between an object and its real image formed by a convex lens of focal length f is equal to $4f$.
Which of the statements given above is/are correct ?
(a) 1 only (b) 2 only
(c) both 1 and 2 (d) neither 1 nor 2
[NDA 2008]

146. Which one of the following is used to remove astigmatism for a human eye ?
(a) concave lens (b) convex lens
(c) cylindrical lens (d) prismatic lens
[NDA 2007]

147. In the figure given below, L_1 and L_2 are two lenses and are kept



along the same axis. A parallel beam of light falling on L_1 leaves L_2 as a parallel beam.
Consider the following statements
(1) both L_1 and L_2 can be convex lenses
(2) The distance between the two lenses can be equal to sum of their focal lengths.
Which of the statements give above is/are correct ?
(a) only 1 (b) only 2
(c) both 1 and 2 (d) neither 1 nor 2
[NDA 2006]

148. What is the essential difference between a terrestrial telescope and an astronomical telescope ?
(a) one of the lenses in a terrestrial telescope is concave
(b) the final image formed in a terrestrial telescope is virtual
(c) a terrestrial telescope forms an erect image while an astronomical telescope forms an inverted image
(d) a terrestrial telescope forms an inverted image while an astronomical telescope forms an erect image.
[NDA 2006]

149. A beam of light travelling at a velocity of V m/s is incident at an angle 45° on a glass. Slab of refractive index 1.5. What is the velocity of the beam of light inside the slab ?
(a) V (b) 2 V/3
(c) $\frac{V}{\sqrt{2}}$ (d) none of the above
[NDA 2006]

150. Optical fibre works on the principle of
(a) total internal reflection (b) refraction
(c) scattering (d) interference *[IAS 1995]*

151. Suppose a rocket ship is receding from the earth at a speed of $\frac{2}{10}$th the velocity of light. A light in the rocketship appears blue to the passengers on the ship. What colour would it appear to an observer on the earth ?
(a) blue (b) orange
(c) yellow (d) yellow-orange
[IAS 1995]

152. An air bubble in water will act like a
(a) convex mirror (b) convex lens
(c) concave mirror (d) concave lens *[IAS 1995]*

153. When a mirror is rotated by an angle θ, the reflected ray will rotated by-
(a) 0° (b) θ/2 (c) θ (d) 2θ
[IAS 1996]

154. Total internal reflection can take place when light travels from
(a) diamond to glass (b) water to glass
(c) air to water (d) air to glass *[IAS 1996]*

155. Assertion (A) : in a motion picture usually 24 frames are projected every second over the whole length of the film.
Reason (R) : An image formed on the retina of eye persists for about o./s after the removal of stimulus.
Codes
(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 a correct explanation of A
(c) A is true but R is false (d) A is false but R is true
[IAS 2000]

156. When a CD (compact disc used in audio and video systems) is seen in sunlight. Rainbow like colours are seen. This can be explained on the basis of the phenomenon of
(a) reflection and diffraction
(b) reflection and transmission
(c) diffraction and transmission
(d) refraction, diffraction and transmission *[IAS 2000]*

157. Assertion (A) : Small glass beads fixed on traffic signal glow brightly when light falls upon them.
Reason (R) : Light is totally reflected when the angle of incidence exceeds a certain critical value and light travelling in a denser medium is reflected from a rarer medium.
Codes :
(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 a correct explanation of A
(c) A is true but R is false (d) A is false but R is true
[NDA 2000]

158. Consider the following natural phenomena :
(1) Terrestrial heating (2) Reflection of light
(3) Refraction of light (4) Diffraction of light
Due to which of these phenomena is mirage formed ?
(a) 1 and 2 (b) 2, 3 and 4 (c) 1 and 3 (d) 4 only
[NDA 2002]

159. Diffusion of light in the atmosphere takes place due to
(a) carbon dioxide (b) dust particles
(c) helium (d) water vapours
[NDA 2003]

160. To which one of the following process is the term CMYK related ?
(a) railway signaling (b) navigation
(c) offset printing
(d) electronic voting machine *[NDA 2006]*

161. Which of the following types of light are strongly absorbed by plants ?
(a) violet and orange (b) blue and red
(c) Indigo and yellow (d) yellow and violet
[NDA 2007]

162. Consider the following statements :
(1) If magenta and yellow coloured circles intersect, the intersected area will have red colour
(2) If cyan and magenta coloured circles intersect, the intersected area will have blue colour
Which of the statements given above is/are correct ?
(a) 1 only (b) 2 only
(c) both 1 and 2 (d) neither 1 nor 2
[NDA 2008]

163. Assertion (A) : In the visible spectrum of light, red light is more energetic than green light.
Reason (R) : The wavelength of red light is more than that of green light
(a) A and R are individually true and R is the correct explanation of A
(b) A and R are individually true but R is not the correct explanation of A
(c) A is true, but R is false
(d) A is false, but R is true *[NDA 2008]*

164. Which one among the following has the highest energy ?
(a) blue light (b) green light
(c) red light (d) yellow light *[NDA 2009]*

165. Which one of the following types of waves are used in a night vision apparatus ?
(a) radio waves (b) microwaves
(c) Infra-red-waves (d) none of these
[IAS 2009]

166. Which one of the following reflects back more sunlight as compared to other three ?
(a) sand desert (b) paddy crop lan
(c) land covered with fresh snow
(d) prairie land *[IAS 2010]*

167. Assertion (A) : A stick is dipped in water in a starting position. If observed side ways, the stick appears short and bent at the surface of water.
Reason (R) : A light coming from the stick under goes scattering from water molecules giving the stick as hart and bent appearance.
(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 a correct explanation of A
(c) A is true but R is false
(d) A is false but R is true *[IAS 2001]*

168. Cylindrical lens is used by a person suffering from :
(a) astigmatism (b) myopia
(c) hypermetropia (d) presbyopia
[CDS 2006]

169. The power of lens is - 2D. What is its focal length ?
(a) 2 m (b) 1.5 m (c) 1.0 m (d) 0.5 m
[CDS 2006]

170. Conider the following statements
(1) light waves can travel in vacuum
(2) light waves can be refracted
(3) light waves are electro magnetic
Which of the statements given above are correct ?
(a) 1, 2 and 3 (b) 2 and 3 only
(c) 1 and 3 only (d) 1 and 2 only *[CDS 2006]*

171. Why is red light employed for danger signals ?
(a) red colour is soothing to the eye
(b) human eye is most sensitive to red colour
(c) red light is cattered least
(d) red light is scattered most *[CDS 2006]*

172. Whose experiments proved that the speed of light was always the same ?
(a) James Clark Maxwell (b) Michelson and Marley
(c) Miller and Stanley (d) Werner Heisenberg
[CDS 2005]

173. How many image can a man see if he stands between two plane mirrors inclined at an angle of 60º ?
(a) 3 (b) 4 (c) 5 (d) 6
[CDS 2004]

174. Phenomenon of formation of three dimensional image by entrance of two light beams from laser or other coherent sources of light is called
(a) optical photography (b) x-ray photography
(c) radiography (d) holography
[CDS 2004]

175. A person standing in front of a mirror finds his image thinner but with normal height
The mirror in question is
(a) concave and spherical
(b) convex and spherical
(c) convex and cylindrical with axis vertical
(d) convex and cylindrical with axis horizontal
[CDS 2003]

176. Which one of the following phenomena can not be attributed to the refraction of light ?
(a) twinkling of stars (b) mirage
(c) rainbow (d) redshift
[CDS 2002]

177. A double convex glass lens of focal length f and having a circular aperture is cut into two halves, each having a semicircular aperture
The focal length of each half is
(a) f (b) $2f$ (c) $f/2$ (d) Infinity
[CDS 2001]

178. To an observer on the lunar surface, during the day time the sky will appear to be
(a) light yellow (b) orange
(c) blue (d) black [CDS 2001]

179. If the angle between two plane mirrors is 60 ; then the number of image formed will be–
(a) Infinite (b) 7
(c) 6 (d) 5 [CDS 2000]

180. The magnifying power of the objective and eye-piece of a compound microscope are m_1 and m_2. The magnifying power of the microscope will be–
(a) $m_1 + m_2$ (b) m_1 / m_2
(c) $m_1 - m_2$ (d) $m_1 . m_2$ [CDS 2000]

181. The chemical part of the dye that absorbs light and produces colour is called–
(a) neon (b) a chromophore
(c) a photochrome (d) a pigment [CDS 2000]

182. Panchromatic photographic film is sensitive to
(a) light of red colour (b) light of yellow colour
(c) light of violet colour
(d) the entire region of the visible spectrum [CDS 2000]

183. In summer, the mirages are seen due to the phenomenon of
(a) reflection of light (b) total internal reflection
(c) interference of light (d) diffraction of light
[SSC GL 2006]

184. Camberts, law is related to
(a) reflection (b) refraction
(c) interference (d) illumination
[SSC GL 2005]

185. Electron micrroscope was invented by
(a) Knoll and ruska (b) Robert Koch
(c) Leeuwenhock (d) CPS wanson
[SSC GL 2004]

186. In which part of the eye lies the pigment, that decides the colour of the eyes of a person ?
(a) cornea (b) choroid
(c) Iris (d) vitreous body
[SSC GL 2003]

187. What is viewed through an electron microscope ?
(a) electrons and other elementary particles
(b) structure of bacteria and viruses
(c) inside of human stomach
(d) inside of the human eye [SSC GL 2006]

188. The phenomenon of splitting white light into seven colours is called
(a) reflection (b) refraction
(c) refractive index (d) disperson

189. A ray of white light strikes the surface of an object. If all the colours are reflected the surface would appear :
(a) Black (b) White
(c) Grey (d) Opaque [CDS 2013]

190. In optical instruments, the lenses are used to form image by the phenomenon of—
(a) reflection (b) refraction
(c) scattering (d) diffusion [NDA 2014]

191. The Laser is a beam of radiations which are
(a) Non-coherent and non-monochromatic
(b) Coherent and non-monochromatic
(c) Non-coherent and monochromatic
(d) Coherent and monochromatic [SSC (LDC) 2013]

192. Total internal reflection occurs when light travels from
(a) a denser medium to a rarer medium with angle of incidence greater than critical angle
(b) a rarer medium to a denser medium
(c) a denser medium to a rarer medium
(d) a rarer medium to a denser medium with angle of incidence greater than critical angle [SSC 2013]

193. Which of the following has the longest wavelength ?
(a) blue light (b) gamma ray
(c) x-ray (d) red light

194. The unit of luminous efficiency of an electric bulb is
(a) watt (b) lumen
(c) lux (d) lumen/watt

195. Dispersion process forms spectrum due to white light falling on a prism. The light wave with shortest wavelength :
(a) refracts the most
(b) does not change the path
(c) refracts the least
(d) is reflected by the side of the prism [CDS 2013]

196. Candela is unit of
(a) acoustic intensity (b) electric intensity
(c) magnetic intensity (d) luminous intensity

197. In a cinema hall, the distance between the projector and the screen is increased by 2%. Then the intensity of illumination on the screen is
(a) decreased by 2% (b) decreased by 4%
(c) increased by 2% (d) increased by 4%

198. Dioptere is the unit of—
(a) power of a lens (b) focal length of a lens
(c) light intensity (d) sound intensity
[SSC (LDC) 2013]

199. What type of lenses are used in movie projectors ?
(a) Zoom lens (b) Meniscus lens
(c) Concave (d) Convex [SSC (MTS) 2014]

200. The principle of light based on which shadow is formed, is—
(a) Rectilinear propagation
(b) Diffraction
(c) Reflection (d) Refraction [SSC 2013]

201. A water tank appears shallower when it is viewed from top due to
(a) rectilinear propagation of light
(b) reflection
(c) total internal reflection
(d) refraction [SSC (LDC) 2006]

202. The primary colours in photography are
(a) red, blue, yellow (b) red, yellow, green
(c) red, blue, green (d) red, green, cyan
[SSC (LDC) 2011]

203. The head mirror used by E.N.T. doctors is
(a) concave (b) convex
(c) plane (d) planoconvex
[SSC (LDC) 2011]

204. A laser beam is always
(a) a convergent beam (b) a divergent beam
(c) a parallel beam
(d) divergent to start with and parallel later on
[SSC (LDC) 2011]

Answers

1. (c)	2. (b)	3. (d)	4. (d)	5. (b)	6. (b)	7. (d)	8. (d)	9. (a)	10. (d)	11. (b)	12. (d)	13. (c)
14. (b)	15. (b)	16. (a)	17. (d)	18. (b)	19. (a)	20. (a)	21. (b)	22. (d)	23. (d)	24. (a)	25. (c)	26. (a)
27. (c)	28. (b)	29. (a)	30. (b)	31. (d)	32. (c)	33. (c)	34. (d)	35. (a)	36. (a)	37. (d)	38. (d)	39. (a)
40. (d)	41. (a)	42. (b)	43. (a)	44. (b)	45. (d)	46. (b)	47. (c)	48. (d)	49. (b)	50. (b)	51. (b)	52. (c)
53. (b)	54. (c)	55. (a)	56. (b)	57. (d)	58. (a)	59. (c)	60. (c)	61. (d)	62. (d)	63. (d)	64. (c)	65. (a)
66. (b)	67. (c)	68. (a)	69. (c)	70. (d)	71. (d)	72. (b)	73. (a)	74. (d)	75. (d)	76. (c)	77. (d)	78. (b)
79. (d)	80. (b)	81. (d)	82. (a)	83. (b)	84. (c)	85. (b)	86. (a)	87. (b)	88. (b)	89. (d)	90. (b)	91. (c)
92. (d)	93. (c)	94. (b)	95. (d)	96. (c)	97. (d)	98. (d)	99. (b)	100. (b)	101. (c)	102. (a)	103. (a)	104. (a)
105. (d)	106. (a)	107. (c)	108. (a)	109. (c)	110. (b)	111. (a)	112. (d)	113. (c)	114. (c)	115. (d)	116. (c)	117. (b)
118. (c)	119. (c)	120. (c)	121. (c)	122. (c)	123. (b)	124. (c)	125. (a)	126. (b)	127. (d)	128. (b)	129. (c)	130. (c)
131. (d)	132. (d)	133. (d)	134. (a)	135. (a)	136. (c)	137. (c)	138. (b)	139. (a)	140. (b)	141. (d)	142. (b)	143. (c)
144. (d)	145. (c)	146. (c)	147. (c)	148. (c)	149. (b)	150. (a)	151. (a)	152. (d)	153. (d)	154. (a)	155. (c)	156. (d)
157. (a)	158. (c)	159. (b)	160. (c)	161. (b)	162. (c)	163. (d)	164. (a)	165. (c)	166. (c)	167. (c)	168. (a)	169. (d)
170. (a)	171. (c)	172. (b)	173. (c)	174. (d)	175. (c)	176. (d)	177. (a)	178. (d)	179. (d)	180. (d)	181. (d)	182. (d)
183. (b)	184. (d)	185. (a)	186. (b)	187. (b)	188. (d)	189. (b)	190. (b)	191. (d)	192. (a)	193. (d)	194. (d)	195. (a)
196. (d)	197. (b)	198. (a)	199. (d)	200. (a)	201. (d)	202. (c)	203. (a)	204. (c)				

5. Electricity and Magnetism

1. According to Coulomb's law, the electrostatic force between two charges is
(a) inversely proportional to the product of the charges
(b) inversely proportional to the square of the distance between the charges
(c) directly proportional to the cube of the distance between charges
(d) none of these

2. The electric field due to a dipole at a distance r from its centre is proportional to
(a) $\frac{1}{r^3}$ (b) r^3 (c) r^2 (d) $\frac{1}{r^2}$

3. 1 volt equals
(a) 1 J (b) 1 J/C
(c) 1C/J (d) None of these

4. In coulomb's law, the constant of proportional $K = \frac{1}{4\pi\in_0}$ has units
(a) N (b) $N - m^2$
(c) $\frac{Nm^2}{C^2}$ (d) $\frac{NC^2}{m^2}$

5. When an ebonite rod is rubbed with fur, the charge acquired by the fur is
(a) negative (b) positive
(c) neutral (d) none of these

6. A positively charged body has
(a) excess of electron
(b) deficiency of electron
(c) no change in number of electron
(d) none of these

7. When a glass rod is rubbed with silk, both glass rod and silk
(a) acquire equal and similar charges
(b) acquire equal and opposite charge
(c) acquire unequal and opposite charge
(d) acquire unequal and similar charges

8. A suitable unit for expressing electric field strength is
(a) $\frac{V}{C}$ (b) A - m (c) C/m^2 (d) N/C

9. How many electrons will have a charge of one coulomb
(a) 6.2×10^{18} (b) 6.2×10^{19}
(c) 5.2×10^{18} (d) 5.2×10^{19}

10. Two charges of 1 C an 5 C are placed at some distance in air. The ratio of the forces acting on them is
(a) 1 : 25 (b) 1 : 5 (c) 1 : 1 (d) 5 : 1

11. An electron volt is equal to
(a) 0.62×10^{13} J (b) 1.6×10^{-13} J
(c) 0.62×10^{19} J (d) 1.6×10^{-19} J

12. Two charges are placed at a distance apart. If a glass slab is placed between them, force between them will
(a) increase (b) decrease
(c) remain same (d) be zero

13. The work done in moving a positive charge on an equipotential surface is
(a) finite and positive (b) infinite
(c) finite and negative (d) zero

14. A soap bubble is given negative charge then its radius
(a) decreases (b) increases
(c) remains unchanged (d) none of these

15. A hollow sphere of copper is positively charged. Then the electric field inside the sphere is
(a) the same as the field at the surface
(b) greater than the field at the surface
(c) less than the field at the surface but not zero
(d) zero

16. The potential inside a hollow spherical conductor
(a) is constant
(b) varies directly as the distance from the centre
(c) varies inversely as the distance from the centre
(d) none of these

17. The electric field intensity on the surface of a charged conductor is
(a) zero
(b) directed normally to the surface
(c) directed tangentially to the surface
(d) directed along 45° to the surface

18. The capacitance unit of convenient size is
(a) farad (b) microfarad
(c) kilo farad (d) mega farad

19. No current flows between two charged bodies when connected
(a) if they have same capacity
(b) if they have the same quantity of charge
(c) if they have same potential
(d) none of these

20. As the electric charge on the surface of a hollow metal sphere increases, the electric field intensity inside the sphere
(a) decrease (b) increase
(c) remains the same (d) none of these

21. The electric field due to point charge at a distance R form it is E. If the same charge is placed on a metallic sphere of Radius R, the electric field on the surface of the sphere will be
(a) zero (b) $\frac{E}{2}$ (c) E (d) $2E$

22. A hollow metal sphere of radius 5 cm is charged so that the potential on its surface is 10 V. The potential at the centre of sphere is
(a) zero (b) 10 V
(c) more than (d) none of these

23. Two concentric metallic spherical shells are given positive charges then
(a) the quarter sphere is always at a higher potential
(b) the inner sphere is always at a higher potential
(c) both the spheres are at the same potential
(d) none of these

24. A conductor carries a certain charge. When it is connected to another uncharged conductor of finite capacity, then the energy of the combined system is
(a) more than that of the first conductor
(b) less than that of first conductor
(c) equal to that of first conductor
(d) uncertain

25. The electric field between the two spheres of a charged spherical condenser
(a) is zero (b) is constant
(c) increase with distance from centre
(d) decrease with distance from centre

26. Capacity of a parallel plate condenser can be increased by
(a) increasing the distance between the plate
(b) increasing the thickness of the plate
(c) decreasing the thickness of the plate
(d) decreasing the distance between the plate

27. The capacitance of parallel plate condenser does not depend on
(a) area of the plate (b) metal of the plate
(c) medium between the plate
(d) distance between the plate

28. Electric field intensity at a point a hollow charged spherical conductor
(a) is zero (b) is constant
(c) increase with the distance from the centre of the sphere
(d) none of these

29. For an electric dipole, the field at a point on the equatorial line and the dipole moment are
(a) in the same direction (b) in opposite direction
(c) perpendicular to each other
(d) not related

30. Electron volt (eV) is a unit of
(a) energy (b) potential (c) current (d) charge

31. The unit of intensity of electric field is
(a) newton/coulomb (b) joule/coulomb
(c) volt-meter (d) newton/metre

32. Equal charges are given to two sphere of different radii. The potential will
(a) be more on the smaller sphere
(b) be more on the bigger sphere
(c) be equal on both the sphere
(d) depend on the nature of the material of the sphere

33. When a positively charged conductor is earth connected.
(a) protons flow from the conductor to the earth
(b) electrons flow from the earth to the conductor
(c) electrons flow from the conductor to the earth
(d) no charge flow occurs

34. The dielectric constant of metals is
(a) 1 (b) greater than 1
(c) 0 (d) infinite

35. In a charged capacitor the energy is stored in
(a) positive charge
(b) both in positive and negative charge
(c) the electric field between the plates
(d) the edges of the capacitor plates

36. Ohm's law is valid in case of
(a) superconductor (b) insulstor
(c) semiconductor (d) conductor

[SSC (LDC) 2013]

37. The SI unit of electric flux is
(a) weber (b) newton per coulomb
(c) voltmetre (d) jule per coulomb

38. Three different capacitors are connected in series then
(a) they will have equal charges
(b) they will have same potential
(c) both (a) and (b) (d) none of these

39. Equal charges are given to two spheres of different radii. The potential will be
(a) more on smaller sphere (b) more on bigger sphere
(c) equal on both the sphere
(d) none of these

40. In bringing an electron towards another electron, the electrostatic potential energy of the system
(a) remains same (b) becomes zero
(c) increases (d) decreases

41. Capacity of a conductor depends upon
(a) size of conductor (b) thickness of conductor
(c) material of conductor (d) all of these

42. A point charge is brought in an electric field. The field at a nearby point
(a) may increase if the charge in positive
(b) may decrease if the charge is negative
(c) both (a) and (b) (d) none of these

43. A steady current is flowing in a conductor of non-uniform cross-section. The charge passing through any cross-section per unit time is
(a) directly proportional to the area of cross-section
(b) inversely proportional to the area of cross-section
(c) proportional to square of the area of cross-section
(d) independent of the area of cross-section

44. If the length of a wire is doubled and its cross section is also doubled, then its resistance will
(a) become one fourth (b) become four time
(c) become two times (d) remain unchanged

45. The resistance of a wire is R. It is stretched uniformly so that its length is doubled. The resistance now becomes
(a) $2R$ (b) $R/2$ (c) $4R$ (d) $R/4$

46. The specific resistance of a wire
(a) varies with its length
(b) varies with its cross-section
(c) varies with its mass
(d) does not depends on its length, cross-section and mass

47. The equivalent resistance of n identical resistors connected in parallel is x. If the resistors are connected in series, the equivalent resistance would be
(a) nx (b) n^2x (c) x/n (d) x/n^2

48. The reciprocal of specific resistance is
(a) conductive resistance (b) specific conductance
(c) resistance (d) plate resistance

49. Kirchhoff's two laws for electrical circuits are manifestations of the conservation of
(a) charge only (b) momentum only
(c) energy only (d) both energy and charge

50. A galvanometer is converted into an ammeter when we connect a
(a) high resistance in series
(b) high resistance in parallel
(c) low resistance in series
(d) low resistance in parallel

51. A galvanometer is converted into a votmeter when we connect a
(a) high resistance in series
(b) high resistance in parallel
(c) low resistance in parallel
(d) low resistance in series

52. The reciprocal of resistance is
(a) conductance
(b) resistivity
(c) conductivity
(d) none of the above

53. Which of the following statements is not true
(a) conductance is the reciprocal of resistance and is measured in siemens
(b) Ohm's law is not applicable at very low and very high temperature
(c) Ohm's law is applicable to semiconductor
(d) Ohm's law is not applicable to electron tubes, discharge tubes and electrolytes

54. Kirchoff's first law, i.e. $\Sigma I = 0$ at a junction, deals with conservation of
(a) charge (b) energy
(c) momentum (d) angular momentum

55. The resistance of material increases with temperature. It is a
(a) metal (b) insulator
(c) semiconductor (d) none of these

56. The resistivity of a wire depends on its
(a) length (b) area of cross-section
(c) shape (d) materical

57. The conductivity of superconductor is
(a) infinite (b) very large
(c) very small (d) zero

58. The resistance of an ideal voltmeter is
(a) zero (b) very low (c) very high (d) infinite

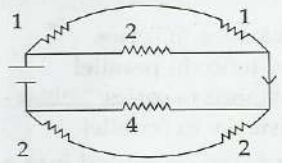
59. The resistance of an ideal ammeter is
(a) zero (b) very low
(c) very high (d) infinite

60. Kirchhoff's voltage law is based on the law of conservation of
(a) momentum (b) charge
(c) mass (d) energy

61. Carriers of electric current in superconductors are
(a) electron (b) photons
(c) holes (d) phonons

62. Electromotive force is most closely related to
(a) electric field (b) magnetic field
(c) potential difference (d) mechanical force

63. The current in the branch AB is



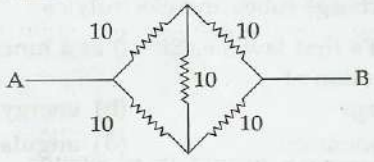
(a) 1 A (b) 2 A (c) 1.5 A (d) 3 A

64. Constantan wire is used in making standard resistance because its
(a) melting point is high (b) density is high
(c) specific resistance is low
(d) temperature coefficient of resistance is negligible

65. Potentiometer measures potential more accurately because
(a) it measures potential in the closed circuit
(b) it measures potential in the open circuit
(c) it uses high resistance potentiometer wire
(d) none of these

66. The capacity of a pure capacitor is 1 farad. In D.C circuit, its effective resistance will be
(a) zero (b) infinite
(c) 1 ohm (d) $\frac{1}{2}$ ohm

67. In the given network, the effective resistance between the points *A* and *B* is



(a) 25 (b) 10 (c) 20 (d) 30

68. Two electric bulbs whose resistance's are in the ratio 1 : 2 are connected in parallel to a constant voltage source. The power dissipated in them have the ratio
(a) 1 : 2 (b) 1 : 1 (c) 2 : 1 (d) 1 : 4

69. If two bulbs of 25 W and 100 W, rated at 220 V, are connected in series across a 440 V supply
(a) 25 W bulb will fuse (b) 100 W bulb will fuse
(c) none will fuse (d) both will fuse

70. Two bulbs are fitted in a room in the domestic electric installation. One of them glows brighter than the other. Then
(a) the brighter bulb has smaller resistance
(b) the brighter bulb has larger resistance
(c) both the bulbs have the same resistance
(d) none of these

71. The heating element of an electric heater should be made of a material having
(a) high specific resistance and high melting point
(b) high specific resistance and low melting point
(c) low specific resistance and low melting point
(d) law specific resistance and high melting point

72. Thermocouple thermometer is based on
(a) Seebeck effect (b) Compton effect
(c) Peltier effect (d) Photoelectric effect

73. A thermoelectric couple is made from copper and iron. At the hot junction, current
(a) flows from copper towards iron
(b) flows from iron towards copper
(c) flow decreases
(d) flow increases

74. When the hot and cold junctions of a thermocouple are interchanged the thermo-emf
(a) becomes zero (b) becomes double
(c) remain same (d) changes sign

75. For electroplating a spoon, it is placed in the voltameter at
(a) the position of anode
(b) the position of cathode
(c) anywhere in the electrolyte
(d) none of these

76. As the temperature of hot junction increases, the thermo-emf
(a) always increases
(b) always decreases
(c) may increase or decrease
(d) always remains constant

77. In the electrolyse's the amount of mass deposited or liberated at an electrode is directly proportional to
(a) square of electric charge
(b) amount of charge
(c) square of current
(d) none of these

78. The temperature at which thermoelectric power of a thermo couple becomes zero is called
(a) inversion temperature
(b) neutral temperature
(c) junction temperature
(d) Null temperature

79. The conductivity of a superconductor is
(a) infinite (b) very large
(c) very small (d) zero

80. A piece of copper and another germanium are cooled from room temperature to 40 K. The resistance of
(a) each of them decreases
(b) each of them increases
(c) copper in creases and germanium decreases
(d) copper decreases and germanium increases

81. If a wire of resistivity ρ is stretched to double its length, then its new resistivity will
(a) be half (b) be double
(c) be four times (d) not change

82. When a body is earth connected, electrons from the earth flow into the body. This means the body is
(a) charged negatively (b) an insulator
(c) uncharged (d) charged positively

83. Specific resistance of a conductor increases with
(a) increase in temperature
(b) increase in cross-section area.
(c) decrease in cross-section area
(d) none of these

84. The practical unit of resistance is . 1 is equal to
(a) 10^8 emu (b) 10^9 emu
(c) 10^{13} emu (d) none of these

85. Current provided by a battery is maximum when
(a) internal resistance is equal to external resistance
(b) internal resistance is greater than external resistance
(c) internal resistance is less than external resistance
(d) none of these

86. The terminal potential difference of a battery exceeds its emf. When it is connected
(a) in parallel with a battery of higher emf.
(b) in series with a battery of lower higher emf
(c) in series with a battery of lower lower emf
(d) in parallel with a battery of lower emf

87. An electric fan and heater are marked as 100 W and 220 V and 1000 W and 220 V respectively. The resistance of heater is
(a) zero (b) greater than that of the fan
(c) lesser than that of fan
(d) equal to that of fan

88. The filament of bulb is of
(a) mercury (b) copper
(c) tungsten (d) none of these

89. Fuse wire should have
(a) low resistance, high melting point
(b) low resistance, low melting point
(c) high resistance, low melting point
(d) high resistance, high melting point

90. If a high power heater is connected to electric mains, then the bulbs in the house become dim because there is a
(a) current drop (b) potential drop
(c) no current drop (d) no potential drop

91. The electric current passing through a metallic wire produces heat because of
(a) collision of conduction electrons with each other
(b) collisions of the atoms of the metal with each other
(c) collision of the conduction electron with the atoms of the metallic wire
(d) none of these

92. Metals are good conductor of heat than insulator because
(a) their atoms are relatively apart
(b) they contain free electron
(c) they have reflecting surface
(d) none of these

93. Which of the following is not the cause of low conductivity of electrolyte
(a) low drifts velocity of ions
(b) high resistance offered by the solution of the motion of ions
(c) low number of density of charge carriers
(d) ionisation of salt

94. A thermoelectric refrigerator works on
(a) jule effect (b) seebeck effect
(c) peltier effect (d) none of these

95. If the electric current in a lamp decreases by 5% then the power output decreases by
(a) 25% (b) 10% (c) 5% (d) 20%

96. Which of the following units measure energy
(a) kilowatt-hour (b) $(\text{volt})^2\,(\text{sec})\,(\text{ohm})^{-1}$
(c) (weber) (ampere) (d) all of them

97. When no current is passed through a conductor
(a) the free electrons do not move
(b) the average thermal velocity of a free electron over a large period of time is zero
(c) the average of thermal velocities of all the free electrons at an instant is zero
(d) (b) and (c) both

98. A particle of mass m and charge q travels from rest through a potential difference V. Its final energy is
(a) qV (b) mqV (c) qV/m (d) mq/V

99. At a point inside a charged conductor the
(a) electric field is zero
(b) electric field is constant
(c) potential is constant
(d) (a) and (c) both

100. The electric potential at the centre of a charged conductor is
(a) zero
(b) twice that of the surface
(c) same as on the surface (d) none of these

101. Good resistance coils are made of
(a) copper (b) manganin
(c) gold (d) silver

102. When a metal is heated, its resistance
(a) decreases (b) increases
(c) may increase or decrease
(d) remains constant

103. An example of a non-ohmic device is
(a) platinum resistance thermometer
(b) copper wire
(c) potentiometer wire
(d) triode

104. The statement "Algebric sum of the current meetting at a node is zero"
(a) Ampere's law (b) Lenz's law
(c) Faraday law (d) Kirchhoff's law

105. The EMF of the Daniel cell is
(a) 0.56 V (b) 1.12 V
(c) 2.56 V (d) 3.12 V

106. The primary cell is a
(a) secondary cell (b) primary cell
(c) both (a) and (b) (d) none of these

107. The electrolyte in the dry cell is
(a) zinc (b) acid of sulpher
(c) ammonium chloride (d) magnese dioxide
[42nd BPSC]

108. The electrolyte in a car battery is
(a) hydrochloric acid (b) sulphuric acid
(c) nitric acid (d) distilled water
[42nd BPSC]

109. The coil of an electric heater is made of—
(a) aluminium (b) tungsten
(c) nichrome (d) none of these

110. Magnetic effect of current was discovered by
(a) Faraday (b) oersted
(c) Kirchhoff (d) joule

111. The unit of Magnetic flux is
(a) weber (b) henry
(c) weber/m^2 (d) ampereim

112. A magnetic field
(a) always exerts a force on a charged particle
(b) never exerts a force on a charged particle
(c) exerts a force on a charged particle if it is moving across the magnetic lines of force
(d) exerts a force on a charged particle if it is moving along the magnetic lines of force

113. Two electron beams are travelling parallel to each other. They
(a) attract each other (b) repel each other
(c) do not effect each other (d) none of these

114. A particle is moving in a uniform magnetic field.
(a) Its momentum changes but total energy remains same
(b) both momentum and total energy remains same
(c) both momentum and total energy change
(d) total energy changes but momentum remains the same

115. If a current is passed in a spring, it
(a) gets compressed (b) gets expanded
(c) oscillates (d) remains unchanged

116. A charged particle is moving with velocity V in magnetic field of induction B. The force on the particle will be maximum when
(a) V and B are in same direction
(b) V and B are opposite direction
(c) V and B are perpendicular
(d) none of these

117. Magnetic field due to an infinite current carrying wire varies with the distance (r) from the wire as
(a) r (b) r^2 (c) $\frac{1}{r}$ (d) $\frac{1}{r^2}$

118. The magnetic induction associated with currents flowing in a hollow copper tube will be
(a) only inside (b) only out side
(c) both inside and outside
(d) neither inside nor outside

119. When a charged particle enters a uniform magnetic field its kinetic energy
(a) remains constant (b) increased
(c) decreases (d) becomes 0

120. The magnetic field lines in the middle of a solenoid are
(a) circle (b) parallel to the axis
(c) spirals (d) perpendicular to the axis

121. Magnetic field inside a solenoid is
(a) directly proportional to current
(b) inversely proportional to current
(c) directly proportional to its length
(d) inversely proportional to the total number of turns

122. The deflection in moving coil galvanometer is
(a) directly proportional to the torsional constant
(b) inversely proportional to the area of the coil
(c) inversely proportional to the current
(d) directly proportional to the number of turns in the coil

123. A moving charged is subjected to an external magnetic field. The change in the kinetic energy of the particle
(a) increases with the increase in the field strength
(b) decreases with the increase in the field strength
(c) is always zero
(d) depends upon whether the field is uniform or non-uniform.

124. A strong magnetic field is applied on a stationary electron, then the electron
(a) moves in the direction of the field
(b) moves opposite to the field.
(c) starts spining
(d) remains stationary

125. An electron is projected in the magnetic field along the lines of force
(a) There will be no effect on the motion of the electron.
(b) the electron speed will increase but the direction will not change.
(c) the electron speed will decrease but direction will not change
(d) none of these

126. The unit of magnetic induction is
(a) weber/m^2 (b) weber/meter
(c) weber (d) none of these

127. In a filament type light bulb most of the electric power consumed appears as
(a) visible light (b) infra-red rays
(c) ultra-violet rays (d) fluorescent light
[SSC (LDC) 2014]

128. A moving charge produces
(a) an electric field only (b) a magnetic field only
(c) both electric and magnetic fields
(d) neither an electric nor a magnetic field

129. Two free parallel wires carrying currents in opposite directions.
(a) do not affect each other
(b) attract each other
(c) repel each other
(d) none of these

130. The current sensitivity of a moving coil galvanometer depends on
(a) the number of turns in the coil
(b) moment of inertia of the coil
(c) strength of the magnetic field
(d) (a) and (c) both

131. In order to increase the current sensitivity of a moving coil galvanometer the
(a) number of turns of the coil should be increase.
(b) strength of the magnetic field should be increased
(c) area of the coil should be increased
(d) all of the above

132. A horizontal cable carries a current from west to east. The direction of the magnetic field produced by the current at a point vertically above the wire is
(a) south to north (b) north to south
(c) east to west (d) west to east

133. A metallic cylinder carries a direct current. The magnetic field produce by it exists
(a) outside the cylinder only
(b) inside the cylinder only
(c) both inside and outside the cylinder
(d) none of these

134. To make the field radial in moving coil galvanometer
(a) the number of turns in the coil is increased
(b) poles are cylindrically cut
(c) magnet is taken in the form of horse shoe
(d) coil is wound an aluminium frame

135. Choose the correct statement :
(a) electric lines of force are closed curves while magnetic lines are not
(b) magnetic lines of force are closed curves while electric lines are not
(c) both electric and magnetic lines of force are closed curves.
(d) none of these

136. A source of magnetic field is
(a) a static electric charge (b) a moving electric charge
(c) a current loop (d) both (b) and (c)

137. A magnetic needle is kept in non uniform magnetic field. It experiences
(a) a force and a torque (b) a force but not a torque
(c) a torque but not a force (d) none of these

138. The SI unit of pole strength is
(a) Am^2 (b) Am^{-1} (c) Am^{-2} (d) Am

139. Magnetic lines of force
(a) cannot intersect at all
(b) intersect at infinity
(c) intersect within the magnet
(d) intersect at the neutral point

140. When magnet is heated, it
(a) loses its magnetism
(b) gains magnetism
(c) gains magnetism up to certain temperature
(d) none of these

141. In the case of a bar magnet, the line of magnetic induction
(a) start from the north pole and end at the south pole
(b) run continuously through the bar and outside.
(c) emerge in circular paths from the middle of the bar.
(d) none of these

142. Time period in a vibration magnetometer will be infinity
(a) at magnetic equator (b) at geographic equator
(c) at magnetic pole (d) no where

143. Demagnensation of a magnet can be done by
(a) rough handling (b) heating
(c) magnetising in the opposite direction
(d) all the above

144. All the magnetic materials lose their magnetic properties when
(a) dipped in water (b) dipped in oil
(c) brought near a piece of iron
(d) strongly heated

145. The relative permeability of a paramagnetic material is
(a) greater than unity (b) less than unity
(c) equal to unity (d) negative

146. Which of the following is most suitable for the core of an electromagnet ?
(a) air (b) soft iron
(c) steel (d) none of these

147. The susceptibility of a diamagnetic material is
(a) small and negative (b) small and positive
(c) large and negative (d) large and positive

148. The relative permeability of a diamagnetic material is
(a) greater than unity (b) less than unity
(c) equal to unity (d) negative

149. The susceptibility of a paramagnetic material is
(a) small and negative (b) small and positive
(c) large and negative (d) large and positive

150. The susceptibility of a paramagnetic material
(a) varies directly as the temperature
(b) varies inversely as the temperature
(c) does not depend on the temperature
(d) none of these

151. The temperature at which a ferromagnetic material becomes paramagnetic is called
(a) critical temperature (b) inversion temperature
(c) curie temperature (d) neutral temperature

152. The core of an electromagnet is made of soft iron because soft iron has
(a) small susceptibility and small retentivity
(b) large susceptibility and small retentivity
(c) large density and large retentivity
(d) small density and large retentivity

153. Soft iron is used in many parts of electrical machines for
(a) low hysteresis loss and low permeability
(b) high hysteresis loss and low permeability
(c) low hysteresis loss and high permeability
(d) high hysteresis loss and high permeability

154. A small piece of an unmagnetised material gets repelled when it is brought near a powerful magnet the material is
(a) paramagnetic (b) diamagnetic
(c) ferromagnetic (d) non magnetic

155. Vibration magnetometer works on the principle of
(a) torque acting on the bar magnet
(b) force acting on the bar magnet
(c) both the force and the torque acting on the bar magnet
(d) none of these

156. Tangent galvanometer is used to measure
(a) steady currents (b) currents impulses
(c) earth's magnetic field (d) none of these

157. Identity the paramagnetic substance :
(a) Iron (b) Aluminium
(c) Nickel (d) Copper

158. Magnetic permeability is maximum for
(a) diamagnetic substances
(b) paramagnetic substances
(c) ferromagnetic substances
(d) all of these

159. The susceptibility of diamagnetic material
(a) decreases with temperature
(b) does not vary with temperature
(c) increase with temp
(d) none of these

160. Which one of the following is not made of soft iron ?
(a) electromagnet (b) core of transformer
(c) core of dynamo
(d) magnet of loudspeaker

161. The north pole of the earth's magnet is near the geographical
(a) south (b) east (c) west (d) north

162. The material of a permanent magnet has
(a) high retentivity, low coercivity
(b) low retentivity, low coercivity
(c) retentivity, low coercivity
(d) high retentivity, high coercivity

163. A substance, when inserted between the poles of a magnet, is pushed out, it is
(a) diamagnetic (b) paramagnetic
(c) ferromagnetic (d) none of these

164. When the radius of the T.G. coil is decreased, its sensitiveness
(a) decreases (b) increases
(c) remains unaltered (d) none of these

165. An example for diamagnetic substance is
(a) Copper (b) Iron
(c) Nickel (d) Aluminium

166. The inherent property of all matter is/are
(a) paramegnetism (b) diamagnetism
(c) ferromagnetism (d) all of the above

167. Au, Ag, Cu, Zn, Sb, Bi, H_2O and air are examples of—
(a) diamagnetic (b) paramagnetic
(c) ferromagnetic (d) none of these

168. Na, Al, Mn, Pt, $CaCl_2$ and oxygen are example of
(a) diamagnetic (b) paramagnetic
(c) ferromagnetic (d) none of these

169. Fe, Co, Ni and Fe_3O_4 are example of
(a) ferromagnetic (b) paramagnetic
(c) diamagnetic (d) none of these

170. A hydrogen atom is paramagnetic. A hydrogen molecule is
(a) diamagnetic (b) paramagnetic
(c) ferromagnetic (d) none of these

171. If a diamagnetic substance is brought near north and south pole of a bar magnet, it is
(a) attracted by poles (b) repelled by poles
(c) attracted by north pole and repelled
(d) none of these

172. The vertical component of earth's magnetic field is zero at a place where angle of dip is
(a) 0° (b) 45° (c) 60° (d) 90°

173. No force is exerted by magnetic field on a stationary
(a) electric dipole (b) magnetic dipole
(c) current loop (d) none of these

174. Magnetic dipole moment is a vector quantity directed from
(a) south to north (b) north to south
(c) east to west (d) west to east

175. Eddy currents are produced in a material when it is
(a) heated
(b) placed in an electric field
(c) placed in a time varying magnetic field
(d) placed in a uniform magnetic field

176. Farraday's law of electromagnetic induction is related to the
(a) law of conservation of charge
(b) law of conservation of energy
(c) third law of motion
(d) none of these

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

178. A.C. power is transmitted from a power house at a high voltages
(a) the rate of transmission is faster at high voltages
(b) it is more economical due to less power loss.
(c) power cannot be transmitted at low voltage.
(d) a precaution against theft of transmission line.

179. Armature current in dc motor will be maximum when the
(a) motor has acquired maximum speed.
(b) motor has acquired intermediate speed
(c) motor has just started moving
(d) none of these

180. Core of a dynamo is laminated because
(a) magnetic field increases
(b) magnetic saturation level in core increases
(c) residual magnetism in core decreases
(d) loss of energy in core due to eddy currents decreases

181. Quantity that remains unchanged in a transformer is
(a) voltage (b) current
(c) frequency (d) none of these

182. The unit of inductance is equivalent of
(a) $\frac{\text{volt} \times \text{ampere}}{\text{second}}$ (b) $\frac{\text{ampere}}{\text{volt} \times \text{second}}$
(c) $\frac{\text{volt}}{\text{ampere} \times \text{second}}$ (d) $\frac{\text{volt} \times \text{second}}{\text{ampere}}$ (VEARS)

183. The direction of induced current is such that it opposes the very cause that has produced it. This is the law of
(a) Lenz (b) Faraday
(c) Kirchhoff (d) Fleming

184. If the rotational velocity of a dynamo armature is doubled, then the induced emf will
(a) become half (b) become double
(c) remain unchanged (d) none of these

185. Energy stored in the choke coil in the form of :
(a) heat (b) electric energy
(c) magnetic energy (d) none of these

186. The core of a transformer is liminated to reduce
(a) copper loss (b) magnetic loss
(c) eddy current loss (d) hysteresis loss

187. Ampere rule is used to find the
(a) direction of current
(b) direction of magnetic field
(c) direction of motion of the conductor
(d) none of these

188. A compass needle just above a wire in which electrons are moving towards east, will point
(a) east (b) west (c) north (d) south

189. A motor converts
(a) mechanical energy into electrical energy
(b) mechanical energy into sound energy
(c) electrical energy into mechanical energy
(d) none of these

190. A dynamo converts
(a) mechanical energy into sound energy
(b) mechanical energy into electrical energy
(c) electrical energy into mechanical energy
(d) none of these

191. By inserting a soft iron piece into solenoid, the strength of the magnetic field
(a) increase (b) decrease
(c) first increase then decrease
(d) remains unchanged

192. By increasing the number of turns in the coil, the strength of the magnetic field
(a) decrease (b) increases
(c) first increases then decreases
(d) remains unchanged

193. If the current in the core decreases, the strength of the magnetic field
(a) decreases (b) increases
(c) remains same (d) none of these

194. Fleming's right hand rule gives
(a) the magnitude of the induced emf
(b) the magnitude of the magnetic field
(c) the direction of the induced emf
(d) none of these

195. The intensity of a magnetic field is defined as the force experienced by a
(a) standard compass (b) unit positive charge
(c) unit negative charge (d) unit north pole

196. The split ring in motion is called
(a) armature (b) rotor
(c) commutator (d) core

197. In a hydel station the motion produced in turbines is due to the
(a) burning of coal (b) burning of diesel
(c) flow of water (d) production of steam

198. The frequency of Ac mains in India is
(a) 100 Hz (b) 50 Hz (c) $\frac{1}{100}$ Hz (d) $\frac{1}{50}$ Hz

199. At a grid sub stations the voltage is stepped up to reduce loss of
(a) current (b) electrical energy
(c) power (d) resistance

200. A switch is always connected to the
(a) earth wire (b) neutral wire
(c) line wire (d) none of these

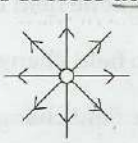
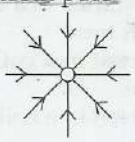
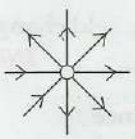
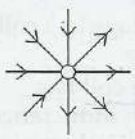
201. A fuse wire is always connected to the
(a) line wire (b) earth wire
(c) neutral wire (d) none of these

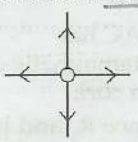
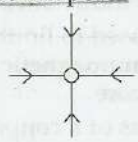
202. Electricians use rubber gloves while working because
(a) rubber is an insulator
(b) rubber is a good conductor
(c) it is easy to work while wearing gloves
(d) none of these

203. Laws of electrolysis is given by (a) Faraday
(b) Maxwell
(c) Lenz (d) Bohar

204. Laws of heating are given by
(a) Joule (b) Ohm (c) Lenz (d) Faraday

205. Magnetite is a / an
(a) natural magnet (b) electromagnet
(c) U-shaped magnet (d) none of these

206. Which of the following figures represents the magnetic lines of force due to an isolated north pole
(a) 
(b) 
(c) 
(d) 

207. Which of the following figures represent the magnetic lines of force due to an isolated south pole
(a) 
(b) 
(c) 
(d) 

208. Electromagnets are used in
(a) electric balls only (b) telephone only
(c) dynamos only (d) all of the above

209. A carbon microphone is best used in a
(a) dynamo (b) telephone
(c) transformer (d) none of these

210. 1 T equals
(a) $1\ NA^{-1}\ m^{-1}$ (b) $1\ NA^{-1}\ m^{-2}$
(c) 1 NAm (d) none of these

211. If a bar magnet is cut length wise into 3 parts, the total number of poles will be
(a) 2 (b) 3 (c) 4 (d) 6

212. The wire having a red plastic covering is a
(a) line wire (b) neutral wire
(c) earth wire (d) none of these

213. The wire having black plastic covering is a
(a) line wire (b) neutral wire
(c) earth wire (d) none of these

214. The wire having a green plastic covering is a
(a) line wire (b) neutral wire
(c) earth wire (d) none of these

215. Which of the following quantities remain constant in a step-down transformer ?
(a) current (b) voltage
(c) power (d) none of these

216. Good conductors have many loosely bound
(a) protons (b) neutrons (c) atoms (d) electrons
[SSC (MTS) 2014]

217. Phase difference between voltage and current in a capacitor in AC circuit is
(a) π (b) $\frac{\pi}{2}$ (c) 0 (d) $\frac{\pi}{3}$

218. Alternating current can be measured by
(a) moving coil galvanometer
(b) hot wire ammeter
(c) tangent galvanometer (d) none of these

219. The phenomenon of electromagnetic induction implies a production of induced
(a) resistance in a coil when the magnetic field changes with time
(b) current in a coil when an electric field changes with time
(c) current in a coil when a magnetic field changes with time
(d) voltage in a coil when a magnetic field changes with time
[NDA 2014]

220. A choke coil has
(a) high inductance and high resistance
(b) high inductance and low resistance
(c) low inductance and high resistance
(d) low inductance and low resistance

221. Choke used to limit high frequency AC has
(a) a paramagnetic core (b) a diamagnetic core
(c) air core (d) iron core

222. The mass of a copper wire of resistance R_1 and length l_1 is four times the mass of another copper wire of length l_2 and resistance R_2. If $R_1 = R_2$, which one of the following is correct ?
(a) $l_1 = l_2$ (b) $l_1 = 4l_2$ (c) $l_1 = 2l_2$ (d) $2l_1 = l_2$
[NDA 2006]

223. Which type of cell can be used if a device requires 75 A of current for 15 seconds ?
(a) simple voltanic cell (b) Daniel cell
(c) Leclanche cell (d) Lead-acid cell
[NDA 2006]

224. Why does the experience a strong shock when one accidentally touches a live wire of say, 220 V ?
(a) the resistance of human body is very low
(b) the resistance of human body is very high
(c) the human body is sensitive to even feeble current
(d) The human body is sensitive to large currents only
[NDA 2006]

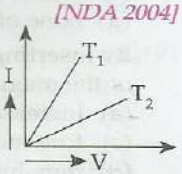
225. Which one of the following statements is correct ? The space surrounding a charge in uniform motion has
(a) only an electric has (b) only a magnetic field
(c) both electric and magnetic field
(d) neither an electric field nor a magnetic field
[NDA 2006]

226. Two electric fans p and $2p$ watt respectively are connected in series. What is the power of the combination in watt ?
(a) p (b) $3p$ (c) $2p/3$ (d) $3p/2$
[NDA 2005]

227. Consider the following statements
(1) An isolated electric charge exist, but an isolated magnetic monopole does not exist.
(2) Electric lines of force are not closed, but magnetic lines of force are closed
Which of the statements given above is / are correct ?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) neither 1 nor 2
[NDA 2005]

228. A large magnet is broken into two pieces. If the lengths of two pieces are in the ratio of 3 : 4. What is the ratio of their pole strengths ?
(a) 3 : 4 (b) 4 : 3 (c) 1 : 1 (d) 3 : 2
[NDA 2004]

229. The current I and voltage V variations for a given metallic wire at two different temperature T_1 and T_2 are shown in the figure. Then, which one of the following is correct ?

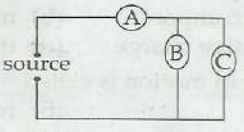


(a) $T_1 > T_2$ (b) $T_1 < T_2$ (c) $T_1 = T_2$ (d) $T_1 = 2T_2$
[NDA 2004]

230. Alternating current instead of direct current is used in long distance electric transmission because
(a) It is easy to generate (b) Rectification is possible
(c) Energy losses are minimum
(d) It causes fewer accidents
[NDA 2004]

231. A wire is bent in the form of uniform circular ring. A and B are two points on the ring such that $\angle AOB = 60^\circ$, where O is the centre of ring. If the equivalent resistance across A and B is 5 . What is the resistance of whole wire
(a) 5 (b) 6 (c) 30 (d) 36
[NDA 2004]

232. Three similar bulbs A, B, C are connected to a voltage source as shown in the figure. If C is removed, how will the illumination of A and B be affected ?



(a) Both A and B will become dimmer
(b) Both A and B will become brighter
(c) A will become dimmer and B will become brighter
(d) A will become brighter and B will become dimmer
[NDA 2004]

233. Consider the following statements regarding electric fuse wire
(1) It has low melting point
(2) It has very high specific resistance
(3) It is connected in parallel with the electric circuit
Which of the statements given above is/are correct ?
(a) 1 only (b) 1 and 3 (c) 1 and 2 (d) 2 and 3
[NDA 2004]

234. Five bulbs each rated as 220 V 100 W burnt 4 hours. What is the cost of electricity consumed if the rate is 50 paise per unit ?
(a) 1 Rupee (b) 2 Rupee
(c) 4 Rupees (d) 8 Rupees *[NDA 2003]*

235. Consider the following statements household electrical appliances are not usually connected in series, because
1. Switching of an appliance would switch off the rest
2. A fuse would blow as soon as one appliance is used.
3. Power consumption would be very much greater
4. The appliances would get damaged due to high current.
(a) 1 only (b) 2 and 3
(c) 3 and 4 (d) 1, 2 and 4
[NDA 2002]

236 An ammeter is connected in series with an unknown resistance and a voltmeter is connected across the terminals of the resistance. If the ammeter reads 1.2 A and the voltmeter reads 18 V the n value of the resistance is
(a) 21.6 (b) 18.0
(c) 15.0 (d) 9.0 *[NDA 2002]*

237 A charge particle moves with velocity $\vec{V}$ in a uniform magnetic field $\vec{B}$. The magnetic force experienced by the particle is
(a) always zero
(b) zero, if $\vec{B}$ and $\vec{V}$ are perpendicular
(c) zero, if $\vec{B}$ and $\vec{V}$ are parallel
(d) zero, if $\vec{B}$ and $\vec{V}$ are inclined at 45º *[NDA 2002]*

238. Domestic electrical wiring is basically a :
(a) series connection
(b) parallel connection
(c) combination of series and parallel connections
(d) series connection within each room and parallel connection elsewhere *[IAS 1996]*

239. Consider the following statements :
At the present level of technology available in India, solar energy can be conveniently used to
(1) Supply hot water to residential buildings
(2) Supply water for minor irrigation projects
(3) Provide street lighting
(4) Electrify a cluster of villages and small towns.
(a) 1, 2, 3 and 4 are correct (b) 2 and 4 are correct
(c) 1 and 3 are correct (d) 1, 2 and 3 are correct
[IAS 1996]

240. A fuse is used in mains electric supply as a safety devices. Which one of the following statements about the fuse is correct ?
(a) It is connected in parallel with the main switch
(b) It is made mainly from silver alloys
(c) It must have a low melting point
(d) It must have a very high resistance *[IAS 1998]*

241. Consider the following statements :
An ordinary light bulb has a rather short life because the
1. filament wire is not uniform
2. bulb cannot be evacuated completely
3. wires supporting the filament melt at high temperatures.
Which of the above statements are correct ?
(a) 1 and 3 (b) 2 and 3
(c) 1 and 2 (d) 1, 2 and 3 *[IAS 1999]*

242. Fluorescent tubes are fitted with a choke. The choke coil :
(a) steps up the line voltage
(b) steps-down the line voltage
(c) reduces current in the circuit
(d) chokes low frequency current *[IAS 2000]*

243. Consider the following statements regarding a motor car battery :
(1) The voltage is usually 12 V
(2) Electrolyte used in hydrochloric acid
(3) Electrodes are lead and copper
(4) Capacity is expressed in ampere-hour.
Which of the above statements are correct ?
(a) 1 and 2 (b) 2 and 3
(c) 3 and 4 (d) 1 and 4 *[IAS 1999]*

244. Two wires have their lengths. diameters and resistivities all in the ratio of 1 : 2. If the resistance of the thiner wire is 10 ohm, the resistance of the thicker wire is :-
(a) 5 ohm (b) 10 ohm (c) 20 ohm (d) 40 ohm
[IAS 2001]

245. What is the order of magnitude of electric resistance of the human body (dry) ?
(a) 10^2 ohm (b) 10^4 Ohm
(c) 10^6 ohm (d) 10^8 ohm *[IAS 2005]*

246. Assertion (A) : In our houses, the current in AC electricity line changes direction 60 times per second.
Reason (R) : The frequency of alternating voltage supplied is 50 Hz.
(a) both A and R are individually true and R is the correct explanation of A.
(b) both A and R are individually true but R is not the correct explanation of A
(c) A is true but R is false
(d) A is false but R is true *[IAS 2004]*

247. Which one of the following is printed on a commonly used fluorescent tube light ?
(a) 220 K (b) 273 K
(c) 6500 K (d) 9000 K *[IAS 2006]*

248. Which one of the following non-metals is not a poor conductor of electricity ?
(a) sulphur (b) selenium
(c) bromine (d) phosphorus *[IAS 2007]*

249. Four wires of same material and of dimensions as mentioned below are stretched by a load of same magnitude separately. Which one of them will be elongated maximum ?
(a) wire of 1 m length and 2 mm diameter
(b) wire of 2 m length and 2 mm diameter
(c) wire of 5 m length and 105 mm diameter
(d) wire of 1 m length and 1 mm diameter *[IAS 2007]*

250. In a dry cell (battery), which of the following are used as electrolytes ?
(a) Ammonium chloride and zinc chloride
(b) sodium chloride and calcium chloride
(c) magnesium chloride and zinc chloride
(d) ammonium chloride and calcium chloride
[IAS 2009]

251. Indiscriminate disposal of used fluorescent electric lamps causes mercury pollution in the environment. Why is mercury used in the manufacture of these lamps ?
(a) a mercury coating on the inside of the lamp makes the light bright white.
(b) when the lamp is switched on, the mercury in the lamp causes the emission of ultra-violet radiations.
(c) when the lamp is switched on, it is the mercury which converts the ultra-violet energy into visible light.
(d) none of the statement given above is correct about the use of mercury in the manufacture of fluorescent lamps. *[IAS 2010]*

252. What is the difference between a CFL and an LED LAMP ?
(1) To produce light, a CFL uses mercury vapour and phosphor while an LED lamp uses semi-conductor material.
(2) The average life span of a CFL is much longer than of and LED lamp.
(3) A CFL is LESS energy-efficient as compared to an LED lamp.
Which of the statements given above is/are correct ?
(a) 1 only (b) 2 and 3
(c) 1 and 3 (d) 1, 2 and 3 *[CSAT 2011]*

253. In electric supply lines in India, which parameter is kept constant ?
(a) voltage (b) current (c) frequency (d) power
[CDS 2007]

254. What is the maximum number of different electrical combination possible with three equal resistances ?
(a) 2 (b) 3 (c) 4 (d) 5
[CDS 2006]

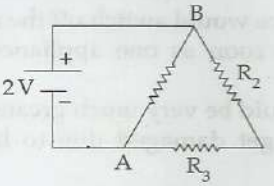
255. A substance which radiates light when heated to a light temperature is said to be
(a) luminescent (b) incandescent
(c) fluorescent (d) phosphorescent
[CDS – 2006]

256. Ohm's law does not apply to which of the following ?
(a) A.C. circuits (b) conductors
(c) semi conductors (d) none of the above
[CDS 2006]

257. Which one of the following is used in storage batteries ?
(a) copper (b) lead (c) tin (d) zinc
[CDS 2006]

258. A DC voltmeter is capable of measuring a maximum of 300 volts. If it is used to measure the voltage across a device operating at 220 voltage AC supply, the reading of the voltmeter will be
(a) 300 volt (b) 220 volt (c) 110 volt (d) 0 volt
[CDS 2002]

259. In the electrical circuit (ABC) as shown in the figure given below, the resistances R_1, R_2 and R_3 are same and equal to 30 . If a sour ce of voltage 2 V is connected across one arm, the current drawn from the voltage source is—



(a) $\frac{1}{5}$ A (b) $\frac{1}{10}$ A (c) $\frac{1}{15}$ A (d) $\frac{1}{45}$ A
[CDS 2002]

260. The circuit element where the impressed voltage is always in phase with the resulting current is
(a) an ideal resistor (b) an ideal capacitor
(c) an ideal coil (d) an ideal transformer
[CDS 2002]

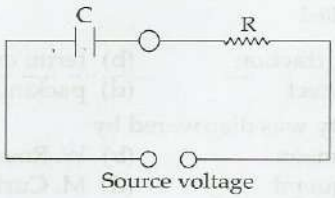
261. A permanent magnet repels
(a) ferromagnetic substances only
(b) diamagnetic substances only
(c) paramagnetic substances only
(d) both paramagnetic and diamagnetic substances
[CDS 2001]

262. A straight horizontal conductor carries a steady electric current from south to north.
Which one of the following events would happen if a small magnetic compass is placed just above the wire ?
(a) the needle remains perpendicular to the conductor
(b) the needle remains parallel to the conductor
(c) the north pole of the needle is deflected towards east.
(d) the north pole of the needle is deflected towards west. *[CDS 2001]*

263. A proton, when accelerated through a potential difference of V volts, has an associated wavelength of λ. In order to have the same associated wavelength, an α-particle must be accelerated through a potential difference of
(a) V volts (b) $4V$ volts
(c) $2V$ volts (d) $V/8$ volts
[CDS 2001]

264. 'mho' is the unit of
(a) resistance (b) specific resistance
(c) conductivity (d) none of these
[CDS 2001]

265. The time constant in seconds of an electrical circuit containing a capacitance of C units and resistance of R units, As shown in the figure, is given by



(a) CR (b) 1/CR
(c) C/R (d) R/C *[CDS 2000]*

266. The core of a transformer is laminated so that
(a) ratio of the voltages across the secondary and primary is doubled
(b) the weight of the transformer can be kept low
(c) the rusting of the core is prevented
(d) energy loss due to eddy currents is minimised *[CDS 2000]*

267. Which of the following is not correctly matched ?
(a) Voltameter - potential difference
(b) Ammeter - electric current
(c) Potentiometer - E.M.F.
(d) Meter bridge - electrical resistance *[CDS 2000]*

268. Consider the following statements. A copper voltameter measures the
(1) quantity of current passing through the circuit
(2) amount of copper deposited
(3) resistance of the circuit
Which of these statements are correct ?
(a) 1, 2 and 3 (b) 1 and 2 (c) 2 and 3 (d) 1 and 3 *[CDS 2000]*

269. Permanent magnet can be made from
(a) cobalt (b) aluminium
(c) zinc (d) lead *[CDS 2000]*

270. MCB, which cuts off the electricity supply in case of short-circuiting works on the
(a) electroplating effect of current
(b) chemical effect of current
(c) heating effect of current
(d) magnetic effect of current *[SSC 2013]*

271. Instrument used to store the electric charge is known as
(a) inductor (b) capacitor
(c) transformer (d) transistor *[SSS, GL 2006]*

272. Which of the following pairs of material serves as electrodes in chargeable batteries commonly used in device such as torch light, electric shaver etc. ?
(a) iron and cadmium (b) nickel and cadmium
(c) lead peroxide and lead (d) zinc and carbon *[SSS, GL 2005]*

273. Conversion of chemical energy into electrical energy occure in
(a) atomic bombs (b) electric heaters
(c) battery (d) dynamo *[SSS, GL 2006]*

274. What is the most commonly used substance in fluorescent tubes ?
(a) sodium oxide and argon
(b) sodium vapour and neon
(c) mercury vapour and argon
(d) mercury oxide and neon *[SSS, GL 2003]*

275. A fuse is used in an electric circuit to—
(a) break the circuit when excessive current flows through the circuit
(b) break the circuit when power gets off
(c) indicate if the current is flowing uninterrupted
(d) complete the circuit for flow of current *[NDA 2014]*

276. A fuse wire is made of
(a) an alloy of tin and copper
(b) an alloy of tin and lead
(c) an alloy of tin and aluminium
(d) an alloy of nickel and chromium *[SSS, (LDC) 2011]*

277. A transformer works with
(a) alternating current (b) direct current
(c) both AC and DC (d) any signal *[SSS, (LDC) 2011]*

Answers

1. (b)	2. (a)	3. (b)	4. (c)	5. (b)	6. (b)	7. (b)	8. (d)	9. (a)	10. (c)	11. (d)	12. (b)	13. (d)
14. (b)	15. (d)	16. (a)	17. (b)	18. (b)	19. (c)	20. (c)	21. (c)	22. (b)	23. (b)	24. (b)	25. (d)	26. (d)
27. (b)	28. (a)	29. (b)	30. (a)	31. (a)	32. (a)	33. (b)	34. (d)	35. (c)	36. (d)	37. (a)	38. (a)	39. (a)
40. (c)	41. (a)	42. (c)	43. (d)	44. (d)	45. (c)	46. (d)	47. (b)	48. (b)	49. (d)	50. (d)	51. (a)	52. (a)
53. (c)	54. (a)	55. (a)	56. (d)	57. (a)	58. (d)	59. (a)	60. (d)	61. (a)	62. (c)	63. (b)	64. (d)	65. (b)
66. (b)	67. (b)	68. (c)	69. (a)	70. (a)	71. (a)	72. (a)	73. (a)	74. (d)	75. (b)	76. (c)	77. (b)	78. (b)
79. (a)	80. (d)	81. (d)	82. (d)	83. (a)	84. (b)	85. (a)	86. (a)	87. (c)	88. (c)	89. (c)	90. (a)	91. (c)
92. (b)	93. (d)	94. (c)	95. (b)	96. (d)	97. (d)	98. (a)	99. (d)	100. (c)	101. (b)	102. (b)	103. (d)	104. (d)
105. (b)	106. (b)	107. (c)	108. (b)	109. (c)	110. (b)	111. (a)	112. (c)	113. (b)	114. (a)	115. (a)	116. (c)	117. (c)
118. (b)	119. (a)	120. (b)	121. (a)	122. (d)	123. (c)	124. (d)	125. (a)	126. (a)	127. (a)	128. (c)	129. (c)	130. (d)
131. (d)	132. (b)	133. (c)	134. (b)	135. (b)	136. (d)	137. (a)	138. (d)	139. (a)	140. (a)	141. (b)	142. (c)	143. (d)
144. (d)	145. (a)	146. (b)	147. (a)	148. (b)	149. (b)	150. (b)	151. (c)	152. (b)	153. (c)	154. (b)	155. (a)	156. (a)
157. (b)	158. (c)	159. (b)	160. (d)	161. (a)	162. (d)	163. (a)	164. (b)	165. (a)	166. (b)	167. (a)	168. (b)	169. (a)
170. (a)	171. (b)	172. (a)	173. (a)	174. (a)	175. (c)	176. (b)	177. (d)	178. (b)	179. (c)	180. (d)	181. (c)	182. (d)
183. (a)	184. (b)	185. (c)	186. (c)	187. (b)	188. (d)	189. (c)	190. (b)	191. (a)	192. (b)	193. (a)	194. (c)	195. (d)
196. (c)	197. (c)	198. (b)	199. (c)	200. (c)	201. (a)	202. (a)	203. (a)	204. (a)	205. (a)	206. (a)	207. (b)	208. (d)
209. (b)	210. (a)	211. (d)	212. (a)	213. (b)	214. (c)	215. (c)	216. (d)	217. (b)	218. (b)	219. (c)	220. (b)	221. (d)
222. (c)	223. (d)	224. (c)	225. (c)	226. (c)	227. (c)	228. (c)	229. (b)	230. (c)	231. (d)	232. (c)	233. (a)	234. (a)
235. (a)	236. (c)	237. (c)	238. (b)	239. (c)	240. (c)	241. (b)	242. (c)	243. (d)	244. (b)	245. (c)	246. (d)	247. (c)
248. (b)	249. (c)	250. (a)	251. (b)	252. (c)	253. (c)	254. (c)	255. (b)	256. (c)	257. (b)	258. (d)	259. (b)	260. (a)
261. (b)	262. (c)	263. (d)	264. (c)	265. (a)	266. (d)	267. (a)	268. (b)	269. (a)	270. (c)	271. (b)	272. (b)	273. (c)
274. (c)	275. (a)	276. (b)	277. (a)									

6. Modern Physics

1. Nucleon is a common name for
(a) proton and electron (b) electron and neutron
(c) neutron only (d) neutron and proton

2. The size of atomic nucleus is of the order of
(a) 10^{-15}m (b) 10^{-12}m (c) 10^{14}m (d) 10^{10}m

3. The size of atom is of the order of
(a) 10^{-14}m (b) 10^{-12}m (c) 10^{-10}m (d) 10^{10}m

4. The ratio of atomic volume to nuclear volume is of the order of
(a) 10^{15} (b) 10^{-12} (c) 10^{8} (d) 10^{-8}

5. The nucleus of an atom consists of
(a) electrons and protons
(b) neutron only
(c) neutrons and protons
(d) proton, electrons and neutrons

6. The mass number of an atom is determined by—
(a) adding the number of neutrons and number of electrons
(b) adding the number of protons and number of electrons
(c) the number of protons only
(d) adding the number of neutrons and number of protons *[NDA 2014]*

7. Particles which can be added to the nucleus of an atom without changing its chemical properties are
(a) electrons (b) protons
(c) neutrons (d) α–particles *[NDA 2005]*

8. The number of electrons in an atom of atomic number Z and mass number A is
(a) Z (b) A (c) $A-Z$ (d) None

9. One atomic mass unit is equal to
(a) mass of one atom of hydrogen
(b) mass of one atom of ${}_6C^{12}$
(c) $\frac{1}{12}$ th of the mass of one atom of ${}_6C^{12}$
(d) None of these

10. The nuclear ${}_6C^{13}$ and ${}_7N^{14}$ can be described as
(a) isobars (b) isotone
(c) isotopes of carbon (d) none of these

11. The mass density of a nucleus varies with the mass number A as
(a) A^2 (b) A (c) $\frac{1}{A}$ (d) Å

12. The density of nuclear matter is of the order of
(a) 10^3 kg/m^3 (b) 10^{10} kg/m^3
(c) 10^{17} kg/m^3 (d) 10^{24} kg/m^3

13. The nuclear force
(a) obeys inverse square law of distance
(b) obeys inverse third power law of distance
(c) is a short range force
(d) is equal in strength to the electromagnetic force

14. If M is the atomic mass and A is its mass number. Then $\frac{M-A}{A}$ is called
(a) binding fraction (b) fermi energy
(c) mass defect (d) packing fraction

15. Radioactivity was discovered by
(a) J.J. Thomson (b) W. Roentgen
(c) H. Becquerel (d) M. Curie

16. In α-decay
(a) mass number A decreases by 4 and atomic number Z increases by 2
(b) A decreases by 4 and Z decreases by 2
(c) A increases by 4 and Z increases by 2
(d) none of these

17. In β–decay
(a) A remains unaffected, Z increases by 1
(b) A is unaffected, Z decreases by 1
(c) A increases by 1 and Z is unaffected
(d) none of these

18. In gamma (γ) decay
(a) Both A and Z increase by 1
(b) Both A and Z decrease by 1
(c) Neither A nor Z changes
(d) A is always equal to Z

19. Alpha rays emitted from a radioactive substance are
(a) negatively charged particles
(b) hydrogen nuclear
(c) helium nuclear
(d) None of these

20. Beta rays emitted by radioactive substance are
(a) electromagnetic radiations
(b) charged particles emitted by the nucleus
(c) electrons orbiting around the nucleus
(d) none of these

21. A radioactive element ${}^A_Z X$, on emitting an α-particle, changes into
(a) ${}^A_{Z-2}Y$ (b) ${}^{A-4}_{Z-2}Y$ (c) ${}^{A-4}_{Z}Y$ (d) None

22. Electromagnetic wave coming out of the nucleus of a natural radioactive atom is—
(a) Alpha ray (b) Beta ray
(c) Gamma ray (d) Microwave *[SSC 2013]*

23. Out of the following, the one which can pass through 20 cm thickness of steel is
(a) α-rays (b) β–rays
(c) γ–rays (d) ultraviolet rays

24. γ–rays are deflected by
(a) an electric field but not by a magnetic field
(b) a magnetic field but not by an electric field
(c) both electric and magnetic field
(d) neither an electric field nor magnetic field

25. The radioactive nuclide ${}^{228}_{88}Ra$ decays by the emission of three α-particles the nuclide X finally formed is
(a) ${}^{220}_{84}X$ (b) ${}^{222}_{86}X$ (c) ${}^{216}_{82}X$ (d) ${}^{215}_{88}X$

26. The end product of the decay of $^{232}_{90}Th$ is $^{208}_{82}Pb$. The number of alpha (α) and beta (β) particles emitted are respectively
(a) 3, 3 (b) 6, 4 (c) 6, 0 (d) 4, 6

27. The nucleus $^{115}_{48}Cd$, after two successive β decays will give
(a) $^{115}_{50}Sn$ (b) $^{113}_{50}Sn$ (c) $^{117}_{50}Sn$ (d) None

28. The percentage of the original quantity of a radioactive material left after five half lives is approximately
(a) 1% (b) 3% (c) 5% (d) 20%

29. A radioactive substance has a half life of 4 months. Three fourths of the substance will decays in
(a) 6 months (b) 8 months
(c) 12 months (d) 16 months

30. The half-life of radium is 6400 years. The fraction of a sample of radium that would remain undecayed after 6400 years is
(a) $\frac{1}{2}$ (b) $\frac{1}{4}$
(c) $\frac{1}{8}$ (d) $\frac{1}{16}$

31. The half-life of a radioactive element which has only $\frac{1}{32}$ of its original mass left after a lapse of 60 days is
(a) 12 days (b) 32 days (c) 60 days (d) 64 days

32. In the transformation sequence represented by $^{A}_{Z}X \longrightarrow {}^{A-4}_{Z-2}Y \longrightarrow {}^{A-4}_{Z-2}Y \longrightarrow {}^{A-4}_{Z-4}K$ The decays in the order
(a) α, β, γ (b) β, γ, α
(c) γ, α, β (d) α, γ, β

33. X^{210} has half life of 5 days. The time taken for seven-eights of sample of X^{210} to decay is
(a) 15 days (b) 20 days (c) 10 days (d) None

34. The number of atoms of a radioactive substance at $t = 0$ is 8×10^4. Its half-life period is 4 years. The number of atoms left undecayed will be 1×10^4 after an interval of
(a) 9 years (b) 12 years
(c) 16 years (d) None

35. Which of the following statement is correct ?
(a) Two isobars always have the same mass number
(b) Two isotopes always have the same mass number
(c) Two isotones always have same mass number
(d) Two isobars always have same atomic number

36. Which of the following isotopes is normally fissionable ?
(a) $^{238}_{92}U$ (b) $^{235}_{92}U$ (c) $^{239}_{93}Np$ (d) $^{4}_{2}He$

37. Isotopes have the same
(a) Atomic number (b) Mass number
(c) Avogadro's number (d) none of these

38. The mass of a neutron is nearly same as that of
(a) a proton (b) a meson
(c) an epsilon (d) an electron

39. The fuel used in nuclear power plants is
(a) U–235 (b) U–238 (c) U–236 (d) U–239
[SSC Grad. level – 2010]

40. Heavy water is used as a moderator a nuclear reactor. The function of the moderator is
(a) to control the energy released in the reactor
(b) to absorb neutrons and stop the chain reaction
(c) to cool the reactor
(d) to slow down the neutrons to thermal energy.
[CSAT 2011]

41. The mass defect per nucleon is called
(a) binding energy (b) packing fraction
(c) ionization energy (d) excitation energy

42. One-sixteenth of initial amount of a radioactive substance remains undecayed after two hours. The half-life of the substance is
(a) 15 min (b) 45 min (c) 30 min (d) 60 min

43. An atom of mass number 15 and atomic number 7 captures an α-particle and then emits a proton. The mass number and atomic number of resulting atom will be respectively
(a) 14 and 2 (b) 15 and 3
(c) 16 and 4 (d) 18 and 8

44. Which of the following statements are true ?
I. All radioactive elements decay exponentially with time
II. Half-life time of radioactive element is the time required for one half of the radioactive atoms to disintegrate
III. Age of the earth can be determined by radioactive dating
IV. Half-life time of a radioactive element is fifty percent of its average life period.
Sleet the correct answer using the codes given below
(a) I and II (b) I, III and IV
(c) I, II and III (d) II and III

45. Energy equivalent to 0.001 mg in
(a) 9×10^7 eng. (b) 9×10^7 J
(c) 9×10^{10} J (d) 3×10^7 eng

46. Thermal neutrons can cause fission in
(a) ^{235}U (b) ^{238}U (c) ^{238}Pu (d) ^{232}Th

47. Nuclear fission experiments slow that the neutrons split the uranium nuclear into two fragments of about the same size. This process is accompained by the emission of several
(a) protons and positrons
(b) α-particles
(c) neutrons
(d) protons and α-particles

48. Curie is a unit of
(a) energy of gamma rays (b) half-life
(c) intensity of gamma rays (d) radioactivity
[SSC Grade level 2001, 02]

49. In a nuclear reactor, cadmium rods are used to
(a) speed up neutrons (b) slow down neutrons
(c) absorb neutrons (d) produce neutrons

50. Fusion reaction takes place at high temperature because
(a) atoms are ionized at high temperature
(b) molecules break up at high temperature
(c) nuclei break up at high temperature
(d) kinetic energy is high enough to overcome repulsion at high temperature

51. Enriched uranium is better as a fuel for a nuclear reactor because it has greater proportion of
(a) ^{233}U (b) ^{235}U (c) ^{238}U (d) ^{239}U

52. During a nuclear fusion reaction
(a) a heavy nucleus breaks into two fragments by itself
(b) a light nucleus bombarded by thermal neutrons breaks up
(c) a heavy nucleus bombarded by thermal neutrons breaks up
(d) two light nuclei combine to give a heavier nucleus and possibly other products

53. The main source of energy in Sun is :
(a) Nuclear fusion (b) Nuclear fission
(c) Chemical reaction (d) Mechanical energy
[CDS 2013]

54. Neutron was discovered by
(a) J.J. Thomson (b) James Chadwick
(c) Rutherford (d) none of these

55. In nuclear reaction, there is conservation of
(a) mass only (b) energy only
(c) momentum only
(d) mass energy and momentum

56. What was the fissionable material used in the bomb dropped at Nagasaki (Japan) in the year 1945 ?
(a) uranium (b) plutonium
(c) neptunium (d) none of these

57. The most penetrating radiation out of the following is
(a) X-rays (b) α–rays (c) β-rays (d) γ-rays

58. The penetrating powers of α, β and γ-radiations, in decreasing order, are
(a) α, β, γ (b) γ, β, α
(c) β, α, γ (d) γ, α, β *[SSC 2013]*

59. In the following nuclear reaction
$_6C^{11} \longrightarrow {}_5B^{11} + \beta^+ + X$
What does X stand for ?
(a) A neutron (b) A neutrino
(c) An electron (d) A proton

60. Which of the following is wrongly matched ?
(a) Barometer—pressure
(b) Lactometer—milk
(c) Coluomb's law—charges
(d) Nuclear reactor—electron

61. Which of the particles has similar mass to that of the electron ?
(a) proton (b) neutron
(c) positron (d) neutrino

62. Complete the reaction
$n + {}^{235}_{92}U \longrightarrow {}^{144}_{56}Ba + \ldots + 3n$
(a) $^{89}_{36}Kr$ (b) $^{90}_{36}Kr$ (c) $^{91}_{36}Kr$ (d) $^{92}_{36}Kr$

63. $^{12}_{6}C$ absorbs an energetic neutron and emits a β–particle. The resulting nucleus is
(a) $^{14}_{7}N$ (b) $^{13}_{7}N$
(c) $^{13}_{7}B$ (d) $^{13}_{6}C$

64. In any fission process. The ratio $\frac{\text{mass of fission products}}{\text{mass of parent nucleus}}$ is
(a) greater than 1 (b) equal to 1
(c) less than 1
(d) depends on the mass of the parent nucleus

65. The electron emitted in beta radiation originates from
(a) inner orbit of atoms
(b) free electrons existing in nucleus
(c) decay of a neutron in a nucleus
(d) None of these

66. In which of the following decays, the atomic number decreases ?
(a) β^-–decay (b) β^+–decay
(c) α–decay (d) b and c both

67. The strongest force in the nature is
(a) electric force (b) gravitational force
(c) nuclear force (d) magnetic force
[SSC Tax Asst. 2008]

68. Atomic power plant works on the principle of
(a) fission (b) fusion
(c) thermal combustion
(d) combined effect of all the three

69. Einstein's mass energy relation in given by the expression
(a) $E = \frac{1}{2}mv^2$ (b) $E = mc^2$
(c) $E = mgh$ (d) none of the above
[SSC Grad level 2006]

70. Which one of the following is not a radioactive element ?
(a) Uranium (b) Thorium
(c) Radium (d) Cadmium

71. An atomic pile is used for—
(a) producing X–rays
(b) conducting nuclear fission
(c) conducting thermonuclear fission
(d) temperature *[SSC GL 2005]*

72. The mass energy relation is the out come of
(a) quantum theory
(b) general theory of relativity
(c) field theory of relativity
(d) special theory of relativity *[SSC GL 2000]*

73. The fourth state of matter is known as
(a) gas (b) vapour
(c) plasma (d) electrons
[SSC GL 2005]

74. Energy is continuously generated in the sun due to
(a) Nuclear fusion (b) Nuclear fission
(c) Radioactivity (d) Artificial radioactivity
[SSC GL 2001]

75. The phenomenon of ejection of electrons from the surface of metals, when light of suitable wavelength falls on it, is known as
(a) Electrolysis (b) Ionization
(c) photo electric effect (d) none of these
[SSC GL 2005]

76. Nuclear forces are
(a) attractive only
(b) repulsive only
(c) attractive or repulsive depending upon separation between nucleons
(d) neither attractive nor repulsive

77. Consider the following metals
(1) uranium (2) radium (3) plutonium
Which of these are used in making nuclear weapons ?
(a) 1 and 2 (b) 1, 2 and 3 (c) 2 and 3 (d) 1 and 3
[CDS 2009]

78. A nuclear reactor harnesses nuclear energy by—
(a) nuclear fusion (b) spontaneous fission
(c) uncontrolled chain reaction
(d) controlled chain reaction *[CDS 2000]*

79. If a proton of mass m in moving with the velocity of light, its mass will be—
(a) unchanged (b) large but finite
(c) infinite (d) zero

80. The equation given below shows the disintegration of the radioactive isotope of hydrogen
$${}_1^3T \longrightarrow {}_2^3He + X$$
Which one of the following is X in the equation ?
(a) Electron (b) deutron
(c) neutron (d) positron *[CDS 2009]*

81. Consider the following statements—
1. Plutonium—239 can be made artificially
2. Boron is used in a nuclear reactor to absorbs unwanted neutrons
3. In nature, the availabitity of uraninum-238 is much more than that of uranium—235.
Which of these statements is are correct
(a) 1 only (b) 1, 2 (c) 1, 2, 3 (d) 3 only
[SSC GL 2002]

82. Which of the following nuclei undergo fission when struck by thermal neutrons
1. U^{235} 2. U^{238} 3. Pu^{239}
Slect the correct answer using the code given below.
(a) 1 and 2 only (b) 2 and 3 only
(c) 1 and 3 only (d) 1, 2, and 3 *[NDA 2007]*

83. Consider the following statements :
1. Atom bomb is based upon the principle of un controlled nuclear fusion
2. Hydrogen bomb is based upon the principle of uncontrolled nuclear fission
3. Nuclear reactor is based upon the principle of controlled nuclear fission
Which of the statements given above is/are correct ?
(a) 3 only (b) 1 and 2 only
(c) 2 and 3 only (d) 1, 2 and *[NDA 2004]*

84. Match List–I (particle) with List–II (approximate rast energy in MeV) and select the correct answer using the codes gives below the lists—

List - I	List - II
A. Electron	1. 940
B. Neutrino	2. 140
C. Neutron	3. 0.5
D. Pi–Meson	4. 0

Code :	A	B	C	D
(a)	2	4	1	3
(b)	3	4	1	2
(c)	3	1	4	2
(d)	2	1	4	3

[NDA 2003]

85. If a U - 238 nucleus splits into two identical parts, the two nuclei so produced will be—
(a) Radioactive (b) Stable
(c) Isotopes (d) Isobars *[NDA 2000]*

86. An atom bomb is based upon the principle of—
(a) Nuclear fission (b) Nuclear fussion
(c) Controlled chain reaction
(d) None of these

87. Hydrogen bomb is based upon the principle of
(a) Nuclear fission
(b) Nuclear fusion
(c) Controlled nuclear fission
(d) None of these

88. Consider the following statements in a nuclear reactor, self sustained chain reaction is possible, because.
1. more neutrons are related in each of the fission reaction
2. the neutrons immediately take part in the fission process
3. the fast neutrons are slowed down by graphite
4. every neutron released in the fission reaction initiates fission.
which of these statements are correct ?
(a) 1, 2 and 3 (b) 1 and 3
(c) 2 and 4 (d) 2, 3 and 4
[IAS 2001]

89. Complete the equation for the following fission process:
$${}_{92}^{235}U + {}_0^1n \longrightarrow {}_{38}^{90}Sr + \ldots$$
(a) ${}_{54}^{143}Xe + 3\,{}_0^1n$ (b) ${}_{54}^{145}Xe$
(c) ${}_{54}^{142}Xe + 3\,{}_0^1n$ (d) ${}_{57}^{142}Xe$

90. Nuclear forces are mediated by
(a) proton (b) neutron
(c) meson (d) electron

91. Nuclear forces are
(a) spin dependent (b) charge dependent
(c) long range (d) none of these

92. Which of the following has rest mass greater than others ?
(a) electron (b) photon
(c) – meson (d) positron

93. The half-life (T) and the disintegration constant (λ) of the radioactive substance are related as
(a) $\lambda T = 1$ (b) $\lambda T = 0.693$
(c) $\frac{T}{\lambda} = 0.693$ (d) $\frac{\lambda}{T} = 0.693$

94. $^{228}_{88}$Ra nucleus there are
(a) 140 protons and 88 neutrons
(b) 140 neutrons and 88 proton
(c) 226 protons and 88 neutrons
(d) 226 neutrons and 88 protons

95. In the nuclear reactors, moderators are used to :
(a) Slow down the neutrons
(b) Generate neutrons
(c) Accelerate neutrons (d) Absorb the neutrons
[SSC 2013]

96. A β–particle is emitted by radioactive nucleus at the time of conversion of
(a) A nucleon in to energy
(b) A positron into energy
(c) A neutron into a proton
(d) A proton into a neutron

97. Percentage of the original number of atoms in a radioactive sample remaining at the end of one mean life is
(a) 50 (b) 60 (c) 63 (d) 37

98. Which of the following particles is unstable
(a) proton (b) electron
(c) photon (d) neutron

99. Fertile material among the following is
(a) U^{235} (b) Pu^{239} (c) U^{233} (d) U^{238}

100. Nuclear fusion is the source of energy in
(a) Sun and atom bomb
(b) Nuclear reactor and sun
(c) Sun and hydrogen bomb
(d) Nuclear reactor and atom bomb

101. The electron emitted in beta radiation originates from
(a) inner orbits of atoms
(b) free electrons existing in nucleus
(c) decay of a neutron in a nucleus
(d) photon escaping from the nucleus

102. Pick out the statement which is true
(a) The energy released per unit mass is more in fusion and that per atom in more in fission
(b) Both fission and fusion produce same amount of energy per atom as well as per unit mass
(c) The energy released per unit mass
(d) The energy released per atom is more in fusion then in fission

103. Energy transferred to a person through gamma rays is measured in units of
(a) caries (b) rutherfords
(c) roentgens (d) none of these

104. Neutrino is a particle which
(a) has no charge but has spin
(b) is charged like electron and has spin
(c) has no charge and no spin
(d) none of these

105. The fusion of hydrogen into helium is more likely to take place
(a) at high temperature and high pressure
(b) at high temperature and low pressure
(c) at low pressure and low temperature
(d) none of these

106. In nuclear fission, the percentage of mass converted into energy is about
(a) 10% (b) 0.01%
(c) 0.1% (d) 1%

107. A good moderator should
(a) not be a gas only
(b) not have appetite for neutrons only
(c) be light in mass number only
(d) be all above three

108. Energy generation in stars is mainly due to
(a) chemical reaction (b) fission of heavy nuclei
(c) fusion of light nuclei (d) fusion of heavy nuclei

109. When $^{30}_{15}$P decays to become $^{30}_{14}$Si, the particle realeased is :
(a) electron (b) α-particle
(c) neutron (d) positron

110. In the following reaction
$^{24}_{12}Mg + ^{4}_{2}He \longrightarrow ^{x}_{14}Si + ^{1}_{0}n$ x is
(a) 28 (b) 27
(c) 26 (d) 22

111. In the following nuclear reaction, $^{6}_{11}C \longrightarrow ^{11}_{5}B + \beta^{+} + X$ What does X stand for ?
(a) a proton (b) a neutron
(c) a nuetrino (d) an electron

112. In photoelectric effect, the number of photo electrons emitted is proportional to :
(a) intensity of incident beam
(b) frequency of incident beam
(c) velocity of incident beam
(d) work function of photo cathode

113. The maximum number of photo electrons released in photocell is independent of
(a) nature of the cathode surface
(b) frequency of incident ray
(c) intensity of radiations incident on cathode surface
(d) none of the above

114. When yellow light is incident on a surface no electrons are emitted while green light can emit. If red light is incident on the surface then ;
(a) no electrons are emitted
(b) photons are emitted
(c) electrons of higher energy are emitted
(d) electrons of lower energy are emitted

115. The photoelectric effect is described as the ejection of electrons from the surface of a metal when
(a) It is heated
(b) It is placed in strong electric field
(c) Electrons of suitable velocity
(d) Light of suitable wavelength falls on it *[SSC 2013]*

116. Matter waves are
(a) Transverse waves (b) Longitudinal waves
(c) de Broglie wave (d) Electromagnetic waves
[SSC (LDC) 2013]

117. The process of emission of electrons from metal by UV rays is—
(a) Photoelectric emission (b) Thermionic emission
(c) Secondary emission (d) Field emission
[SSC (MTS) 2014]

118. The electrons are emitted in the photoelectric effect from a metal surface :
(a) only if the frequency of the incident radiation is above a certain threshold value
(b) only if the temperature of the surface is high
(c) at the rate of independent of the nature of the metal
(d) none of these

119. The dual nature of light is exhibited by :
(a) diffraction and photoelectric effect
(b) diffraction and reflection
(c) refraction and interference
(d) photoelectric effect

120. Photocells are used for the
(a) reproduction of pictures from the cinema film
(b) reproduction of sound from the cinema film
(c) automatic switching of street light
(d) (b) and (c) both

121. Photoelectric effect can be explained by assuming that light
(a) is a form of transverse wave
(b) is a form of longitudinal wave
(c) can be polarised
(d) consists of quanta

122. Which is the incorrect statement of the following—
(a) photon is a particle with zero rest mass
(b) photon is a particle with zero momentum
(c) photon travels with velocity of light in vacuum
(d) photon even feel the pull of gravity

123. The velocity of photo electron emitted in photoelectric effect depends only on
(a) the frequency and intensity of incident light
(b) the frequency of incident light
(c) both (a) and (b)
(d) the wave length of incident light

124. If alpha, beta and gamma rays carry same momentum, which has the longest wavelength
(a) alpha rays (b) beta rays
(c) gamma rays
(d) none, all have same wavelength

125. Which of the following has the longest de Broglie wavelength if they are moving with same velocity ?
(a) neutron (b) proton
(c) α-particle (d) β-particle

126. The wavelength of the matter waves is independent of
(a) charge (b) momentum
(c) velocity (d) mass

127. Consider the following statements :
(1) According to de Broglie hypothesis particle have wave-like characteristics
(2) When an electron and proton have the same de Broglie wave length, they will have equal momentum which of the statements given above is/are correct.
(a) 1 only (b) 2 only
(c) both 1, 2 (d) neither 1 nor 2
[NDA 2004]

128. A photo sensitive material would emit electrons, if excited by photons beyond a threshold. To overcome the threshold, one would increase :
(a) the voltage applied to the light source
(b) intensity of light
(c) the wavelength of light
(d) the frequency of light

129. Which of the following is not the property of cathode rays ?
(a) at produces heating effect
(b) it does not deflect in electric field
(c) its casts shadow
(d) it produces fluorescence

130. X-rays are .....waves.
(a) longitudianl (b) transverse
(c) electromagnetic (d) elastic *[SSC 2013]*

131. Which of the following phenomena is observed when black discharge occurs in a discharge tube ?
(a) the wall of the tube opposite to the cathode glow
(b) striations are seen
(c) a glow appears at the cathode
(d) positive column appears

132. In a discharge tube, ionization of enclosed gas is produced due to collisions between
(a) neutral gas atoms/molecule
(b) positive ions and neutral atoms/molecule
(c) negative electrons and neutral atoms/molecules
(d) photons and neutral atoms/molecules

133. J.J. Thomson's cathode ray tube experiment demonstrated that :
(a) cathode rays are streams of negatively charged ions.
(b) all the mass of an atom is essentially in the nucleus
(c) the e/m of electrons is much greater than the e/m of proton.
(d) the e/m ratio of the cathode ray particle changes when a different gas is placed in the discharge tube

134. The important conclusion given by Millikan's experiment about the charge is
(a) charge is never quantized
(b) charge has no definite value
(c) charge is quantized
(d) charge on oil drop always increases

135. Voltage applied between the electrodes of discharge tube is of the nature
(a) 220 V alternating voltage
(b) 220 V DC voltage
(c) variable voltage
(d) voltage obtained by induction coil

136. Cathode rays are similar to visible light rays, in that
(a) they both can be deflected by electric and magnetic fields
(b) they both have a definite magnitude of wavelength
(c) they both can ionise the gas through which they pass
(d) they both can affect photographic plates

137. When the speed of electrons increases, then the value of the specific charge on an electron
(a) increases (b) decreases
(c) remains unchanged (d) none of these

138. The cause of fractional atomic weights of elements is the presence of
(a) isobars (b) isotopes
(c) isotones (d) none

139. To produce deflection in a television picture tube :
(a) an electric field is used
(b) a magnetic field is used
(c) both electric and magnetic field are used
(d) none of the above

140. The cathode ray particles originate in a discharge tube from the
(a) cathode (b) anode
(c) source of high voltage (d) residual gas

141. Compton effect is associated with
(a) positive rays (b) β-rays
(c) γ-rays (d) X-rays

142. In the experiments for determination of e / m of electrons by Thomson method electric and magnetic fields are :
(a) parallel and both are perpendicular to the motion of the electron
(b) both mutually parallel and also parallel to the motion of the electron
(c) both mutually perpendicular and also perpendicular to the motion of the electron
(d) both mutually perpendicular and have no relation with the motion of the electron

143. The scientist who experimentally showed that electric charge is quantised only in terms of integral multiples of electronic charge is
(a) Max Born (b) Max planck
(c) Thomson (d) Millikan

144. Cathode rays enter an electric field normal to the lines of force. Then their path in the electric field is
(a) straight line (b) ellipse
(c) circle (d) parabola

145. Cathode rays are made up of electrons. Anode rays are made up of
(a) protons only
(b) protons and positrons only
(c) positive residence of atom
(d) all positive particles of atom

146. (e/m) ratio of anode rays produced in discharge tube, depends on the
(a) nature of the gas filled in the tube
(b) nature of the material of anode
(c) nature of the material of cathode
(d) all of the above

147. The first explosion of an atomic device in India was carried out in the state of
(a) Jammu and Kashmir (b) Nagaland
(c) Manipur (d) Rajasthan
[SSC (LDC) 2004]

148. Direct conversion of solar energy with the use of photovoltaic cell results in the production of
(a) optical energy (b) electrical energy
(c) thermal energy (d) mechanical energy
[SSC (LDC) 2011]

Answers

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

7. Electronic Devices and Communication System

1. Metallic solids are always opaque because
   (a) they reflect all the incident light
   (b) they scatter all the incident light
   (c) the incident light is readily absorbed by free electrons in a metal
   (d) the energy band traps the incident light
2. When the temperature of semiconductor is increased, its electrical conductivity
   (a) increases (b) remains the same
   (c) decreases (d) None of these
3. With the rise of temperature, the specific resistance of semiconductor
   (a) increases (b) remains unchanged
   (c) decreases (d) None of these
4. A pure semiconductor has
   (a) an finite resistance at 0° C
   (b) a finite resistance which does not depend upon temperature
   (c) a finite resistance which decreases with temperature
   (d) a finite resistance which increases with temperature
5. The impurity atoms with which pure selicon should be dopped to make a p-type semiconductor are those of
   (a) phosphorus (b) boron
   (c) aluminium (d) both (b) and (c)
6. If germinium has to be doped with a donor impurity, the foreign atom should be
   (a) tetravalent (b) pentavalent
   (c) trivalent (d) None of the above
7. A hole in p-type semiconductor is
   (a) an excess electron (b) a missing electron
   (c) a missing atom (d) a donor level
8. An *n*-type semiconductor is formed
   (a) When germinium crystal is doped with an impurity containing three valence electron
   (b) When germinium crystal is doped with an impurity containing five valence electron.
   (c) from pure germinium (d) from pure silicon
9. A typical example of a semiconductor is
   (a) platinum (b) germinium
   (c) quartz (d) mica
10. The resistance of a pn juction in forward bias is
   (a) zero (b) low
   (c) high (d) infinite
11. In an intrinsic semiconductor
   (a) only electrons are responsible for the blow of current
   (b) only holes are responsible for the blow of current
   (c) both holes and electrons carry current and their number is the same
   (d) None of these
12. The reverse biassing in a junction diode
   (a) decrease the potential barrier
   (b) increase the potential barrier
   (c) increase the number of majority charge carriers
   (d) None of these
13. When arsenic is added as an impurity to silicon. the resulting material is
   (a) *n*-type semiconductor
   (b) *p*-type semiconductor
   (c) *n*-type conductor
   (d) None of these
14. A diode can be used for
   (a) amplification (b) modulation
   (c) detection (d) rectification
15. A transistor is made of
   (a) intrinsic semiconductors
   (b) doped semiconductors
   (c) a metal piece sandwiched between two intrinsic semiconductors
   (d) None of these
16. A diode as a rectifier converts
   (a) ac to dc (b) dc to ac
   (c) varying dc into constant dc
   (d) high voltage into low voltage and vice-versa
17. In a transistor, the base is
   (a) an insulator
   (b) a conductor of low resistance
   (c) a conductor of high resistance
   (d) an extrinsic semiconductor
18. In a transistor
   (a) both the emitter and the collector are equally doped
   (b) emitter is more heavily doped than the collector
   (c) the base is made very thin and is lightly doped.
   (d) (b) and (c)
19. In a transistor
   (a) length of emitter is greater than that of collector
   (b) length of collector is greater than that of emitter
   (c) both collector and emitter have the same length
   (d) None of these
20. In a transistor the emitter current is
   (a) slightly more than the collector current
   (b) slightly less than the collector current
   (c) equal to the collector current
   (d) equal to the base current
21. In the use of transistor as an amplifier
   (a) the emitter-base junction is forward baised and the collector-base junction is reverse biased
   (b) both the junctions are forward biased
   (c) any of the two junctions may be forward biased
   (d) None of these
22. The positive charge carriers in semiconductor are
   (a) positive ions (b) protons
   (c) positrons (d) holes

23. In a *p*-type semiconductor the majority charge carriers are
(a) electrons (b) holes
(c) neutrons (d) protons

24. Te unidirectional property of a *pn*-junction is useful for its use as a
(a) rectifier (b) oscillator
(c) amplifer (d) transformer

25. At zero degree kelvin a piece of germinium
(a) becomes semiconductor
(b) becomes good conductor
(c) becomes bad conductor
(d) None of these

26. A zener diode is also a *p-n* junction diode. It can be used as / an
(a) full-wave rectifier
(b) ac voltage regulator
(c) dc voltage regulator
(d) half-wave rectifier

27. An oscillator is nothing but an amplifier with
(a) positive feedback (b) large gain
(c) no feedback (d) negative feedback

28. In A*p*-type semiconductor,
(a) holes are the only carriers
(b) electrons are the only carriers
(c) holes are the majority carriers and electrons are the minority carriers
(d) None of these

29. The electrical conductivity of a pure silicon sample can be increased by
(a) increasing the temperature
(b) doping it with acceptor and donor impurity
(c) shining ultraviolet light on it
(d) all of these

30. Which of the following is not a semiconductor
(a) germinium (b) silicon
(c) arsenic (d) all of these

31. The electrical circuit used to get smooth DC output from a rectifier circuit is called
(a) amplifer (b) filter
(c) oscillator (d) full rectifier

32. Consider the following statements—
1. In a semiconductor, the uppermost band is the valence band
2. All semiconductors are electrically neutral
3. with increase of temperature the resistivity of a semiconductor decreases.
4. Addition of a small amount of impurity of a III or V group elements to a pure semiconductor increases its resistivity

Choose the correct statements :
(a) 1 and 2 (b) 2 and 3
(c) 3 and 4 (d) 1 and 4

33. In a good conductor the energy gap between the conduction band and the valence bond is
(a) narrow (b) zero (c) infinite (d) wide

34. Intensity of light is measured by
(a) photocell in forward bias
(b) photocell in reverse bias
(c) L.E.D. in forward bias
(d) L.E.D. in reverse bias

35. The waves relevant to telecommunications are
(a) visible light (b) infrared
(c) ultraviolet (d) microwave

36. Modem is a device used for
(a) modulating signals
(b) converting analog signals to digital signals
(c) either of the above
(d) none of the above

37. A digital signal possesses :
(a) continuously varying values
(b) only two discrete values
(c) only four discrete values
(d) None of the above

38. A digital signal :
(a) is less reliable than analog signal
(b) is more reliable than analog signal
(c) is equally reliable as the analog signal
(d) None of the above

39. Modern communication systems use :
(a) analog circuits (b) digital circuits
(c) combination Å analog and digital circuits
(d) None of these

40. For television broadcasting the frequency employed is normally
(a) 30 - 300 MHz (b) 30 - 300 GHz
(c) 30 - 300 kHz (d) 30 - 300 Hz

41. The audio signal
(a) can be sent directly over the air for distance
(b) can not be sent directly over the air for large distance
(c) possess very high frequency
(d) None of the above

42. Optical fibre communication is generally preferred over general communication system because :
(a) it is more efficient
(b) of signal security
(c) both (a) and (b) (d) None of these

43. The diameter of optical fibre is :
(a) 10^{-3} cm (b) 10^{-4} cm
(c) 10^{-2} cm (d) 10^{-5} cm

44. Intelsat satellite works as a :
(a) transmitter (b) repeater
(c) absorber (d) None of these

45. Which of the following statellites is used in ship-to-shore and shore-to-shore and shore-to-ship communication ?
(a) intelsat (b) marisat
(c) comsat (d) telestar

46. Intelsat salellite is used for
(a) radio communication
(b) intercontinental communication
(c) radar communication
(d) None of the above

47. The frequency band used for radar relay-systems and television is
(a) UHF (b) VLF
(c) VHF (d) EHF

48. The absorption of radio waves by the atmosphere depends on
(a) their distance from the transmitter
(b) the polarisation of the wave
(c) their frequency
(d) the polarisation of the atmosphere

49. Radio wave of constant amplitude can be generated with
(a) Filter (b) Rectifier
(c) FET (d) Oscillator

50. The space waves which are affected seriously by atmospheric conditions are
(a) MF0 (b) HF
(c) VHF (d) UHF

51. Which of the following is not transducer
(a) loudspeaker (b) amplifier
(c) microphone (d) all of these

52. Antenna is
(a) inductive
(b) capacitive
(c) resistive its resonant frequency
(d) resistive at resonant frequency

53. Which of the following device is full duplex
(a) mobile phone (b) walky-talky
(c) loudspeaker (d) radio

54. The sky wave propagation is suitable for radio waves of frequency.
(a) up to 2 MHz
(b) from 2 MHz to 20 MHz
(c) from 2 MHz to 30 MHz
(d) from 2 MHz to 80 MHz

55. Resistivity of semiconductor depends on
(a) shape of semiconductor
(b) length of semiconductor
(c) atomic nature of semiconductor
(d) shape and atomic nature of semiconductor

56. *n*-type of semiconductor is
(a) negatively charged
(b) positively charged
(c) neutral
(d) none of these

57. A semiconducting device is connected in a series circuit with a battery and a resistance. Current is found to pass through the circuit. If the polarity of the battery is reversed, the current drops to zero. The device may be
(a) *p*-type semiconductor (b) *n*-type semiconductor
(c) an intrinsic semiconductor
(d) *p-n* junction *[NDA 2014]*

58. The electrical circuits used to get smooth dc output from a rectified circuit is called
(a) oscillator
(b) full wave rectifier
(c) amplifier
(d) filter

59. Match the quantities of column I with the corresponding quantities in column II

Column - I	Column - II
(A) Germanium at 0 K	(i) Intrinsic semiconductor
(B) Germanium at room temperature	(ii) Insulator
(C) Germanium doped with indium	(iii) *n*-type semiconductor
(D) Germanium dopped with arsenic	(iv) *p*-type semiconductor

Code :	A	B	C	D
(a)	(i)	(ii)	(iii)	(iv)
(b)	(ii)	(i)	(iv)	(iii)
(c)	(ii)	(i)	(iii)	(iv)
(d)	(i)	(ii)	(iv)	(iii)

60. Long distance short-wave radio broad-casting uses
(a) ground wave
(b) ionospheric wave
(c) direct wave
(d) sky wave

61. Through which mode of propagation the radiowaves can be sent from one place to another
(a) ground wave propagation
(b) sky wave propagation
(c) space wave propagation
(d) all of them

62. Communication system may be
(a) electrical (b) electronic
(c) optical (d) any of the above

Direction (63-64) The following question of two statements each, printed as

Assertion and Reason

While answering these questions you are required to choose any one of the following for responses
(A) If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion
(B) If both Assertion and Reason are true but Reason is not correct explanation of the Assertion
(C) If Assertion is true but Reason is false
(D) If both Assertion and Reason are false

63. **Assertion :** Short wave band are used for transmission of radio waves to a large distance
Reason : Short waves are reflected from ionosphere
(a) A (b) B
(c) C (d) D

64. **Assertion :** A dish antenna is highly directional
Reason : This is because a dipole antenna is omni directional
(a) A (b) B
(c) C (d) D

65. The technique of collecting information about an object from a distance without making physical contact with it is
(a) remote sensing (b) remote control
(c) remote accessing (d) space shuttle
[SSC (LDC) 2011]

66. In black and white televisions, pictures on the screen are produced due to bombardment of :
(a) X-ray photons on a white screen
(b) X-ray photons on a white fluorescent screen
(c) electrons on a white screen
(d) electrons on a fluorescent white screen

67. What does the term Dolby B or Dolby C printed on tape-recorders and other sound systems refer to ?
(a) frequency modulated system
(b) amplitude modulated system
(c) noise reduction circuit
(d) both DC and AC power can be used *[IAS 2006]*

68. What is the difference between bluetooth and Wi - Fi devices ?
(a) bluetooth used 2.4 GHz radio frequency band where as Wi - Fi can use 2.4 GHz or 5 GHz frequency band
(b) bluetooth is used for wirless local area networks (WLAN) only. Where as Wi - Fi is used for wireless wide area networks (WWAN) only
(c) when information is transmitted between two devices using bluetooth technology, the devices have to be in the line of sight of each other, but when Wi - Fi technology is used the devices need not be in the line of sight of each other
(d) The statements (a) and (b) given above are correct in this context *[CSAT 2011]*

69. The efforts to detect the existence of Higgs boson particle have become frequent news in the recent past. What is/are the importance/importances of discovering this particle ?
1. It will enable us to understand as to why elementary particles have mass.
2. It will enable us in the near future to develop the technology of transferring matter from one point to another without traversing the physical space between them.
3. It will enable us to create better fuels for nuclear fission.

Select the correct answer using the codes given below.
(a) 1 only (b) 2 and 3 only
(c) 1 and 3 only (d) 1, 2 and 3 *[IAS 2013]*

70. Which one among the following is ***not*** a correct statement ?
(a) Cathode rays are negatively charged particles
(b) Cathode rays are produced from all the gases
(c) Electrons are basic constituents of all the atoms
(d) Hydrogen ions do not contain any proton *[CDS 2013]*

71. When two semiconductors of p- and n-type are brought in contact, they form p-n junction which acts like a/an
(a) Rectifier (b) Amplifier
(c) Conductor (d) Oscillator *[LDC 2014]*

Answers

1. (c)	2. (a)	3. (c)	4. (c)	5. (d)	6. (b)	7. (b)	8. (b)	9. (b)	10. (b)	11. (c)	12. (b)	13. (a)
14. (d)	15. (b)	16. (a)	17. (d)	18. (d)	19. (b)	20. (a)	21. (a)	22. (d)	23. (b)	24. (a)	25. (c)	26. (c)
27. (a)	28. (c)	29. (d)	30. (c)	31. (b)	32. (b)	33. (b)	34. (a)	35. (d)	36. (b)	37. (b)	38. (b)	39. (b)
40. (a)	41. (b)	42. (c)	43. (b)	44. (b)	45. (b)	46. (b)	47. (a)	48. (c)	49. (d)	50. (d)	51. (b)	52. (a)
53. (a)	54. (c)	55. (c)	56. (c)	57. (a)	58. (d)	59. (b)	60. (b)	61. (d)	62. (d)	63. (a)	64. (b)	65. (a)
66. (d)	67. (c)	68. (a)	69. (a)	70. (d)	71. (a)							

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