# CHAPTER -9
MOTION

Multiple Choice Questions

1. Which of the following can be zero, when a particle in motion for sometime :
   a) distance
   b) displacement
   c) speed
   d) none of them

2. The slope of velocity time graph shows :
   a) acceleration   b) Speed
   c) displacement
   d) none of these

3. Two boys start running towards each other from two points, they are 120 m apart. One run with the speed of 5m/ s and other with the speed of 7m/ s, when and where do they meet each other from 1ˢᵗ point :
   a) 10s,50m   b) 10s,70m
   c) 24s,50m   d) 17s,70m

4. A body travels from position A to position B with a velocity of 40 m/s and returns from B to A with a velocity of 40 m/s. Then average speed of the body is :
   a) 25m/s   b) 40 m/s
   c) 45 m/s   d) 70 m/s

5. In Q.No. 4 the average velocity of the body for the whole journey is :
   a) Zero   b) 35 m/s
   c) 30 m/s   d) 70 m/s

6. A cyclist moving on a circular track of radius 60m complete half revolution in 40 s. Its average velocity is:
   a) Zero   b) 4 π m/s
   c) 2 m/s   d) 8 π m/s

7. A body covers a maximum height h When thrown up with an initial velocity U. Then maximum height 'h' is given by:

a) $\dfrac{U^2}{2g}$ b) $\dfrac{U}{2g}$

c) $\dfrac{2U}{g}$ d) $\dfrac{2g}{U}$

8. A man walk 8 metres towards east and 6 metres toward north. The magnitude of displacement is
   a) 8 m   b)   6 m
   c) 10 m   d)   14 m

9. Displacement time graph shown in fig 1.8 is of a body traveling with:
   a) Uniform acceleration
   b) Uniform retardation
   c) Uniform velocity
   d) None of these

(Fig.1.8)
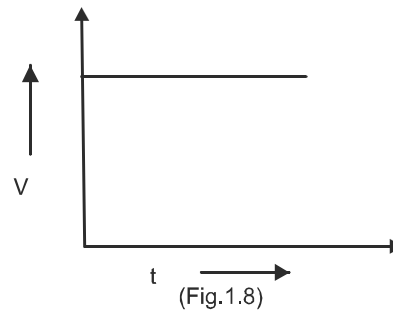
10. Which of the following displacement time graph represents a body in accelerated motion:
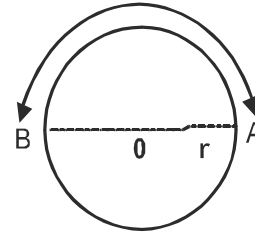
a)

b)

c)

d)
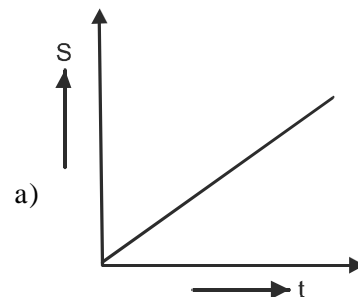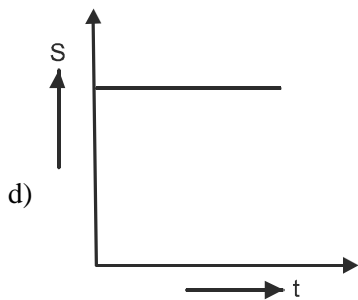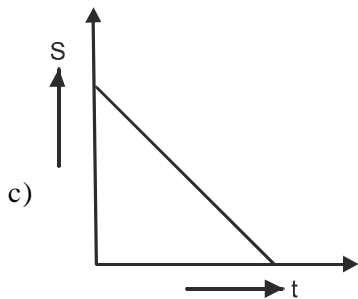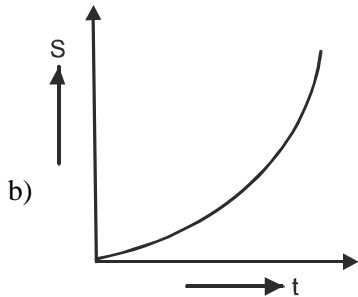
11. A body moving along a circular path has :
   a) a constant speed
   b) a constant velocity
   c) no radial acceleration
   d) no tangential acceleration

12. A person moves from a certain point A and goes around a circle of radius 1m (fig. 1.9). Then his displacement when he reaches at point B, diametrically opposite to B is :
   a) 2   b) 2π
   c) π d) $1/\pi$

(Fig.1.9)

13. In Q.No. 12, the distance covered by the person in moving from A to B is :
   a) π b) 2π
   c) $2\pi^{-1}$ d) 2

14. In Q.No. 12, if the person goes round the whole circle and returns to point A, then his displacement is :
   a) 2π b) $2\pi^{-1}$
   c) π d) zero

15. In Q.No. 12, the distance covered by the person in going around one trip is :
   a) 2π b) 2
   c) π d) zero

16. An object is projected upward with velocity of 98m/s. It will strike the ground in approximately :
   a) 5s   b) 20s
   c) 10s   d) 15s

17. A body traveling with a constant velocity has an acceleration equal to :
   a) Infinity   b) unity
   c) zero   d) can't say

18. When a body is at rest, its velocity is :
   a) zero   b) positive
   c) negative   d) unity

19. The speed of a car increases from 36 km/hr to 72 km/hr in 10 seconds. Then its acceleration is :
   a) $1m/s^2$ b) $2m/s^2$
   c) $3 m/s^2$ d) $4m/s^2$

20. A particle moves east with a velocity of 15 m/s for 2 sec and then it moves north for next 8 sec with a velocity of 5 m/s. Then average velocity of the particle is :
   a) 10 m/s
   b) 7 m/s
   c) 5 m/s
   d) 3 m/s

21. Angular velocity (*w*) and linear velocity (*v*) of a body moving in a circle of radius (*r*) are related as :

   a) $v = \dfrac{w}{r}$
   b) $v = rw$
   c) $r = vw$
   d) None of these

22. Displacement time graph of bodies A and B are shown in fig 1.11. Which one has greater velocity
   a) A
   b) B
   c) A and B both have same velocity
   d) none of these
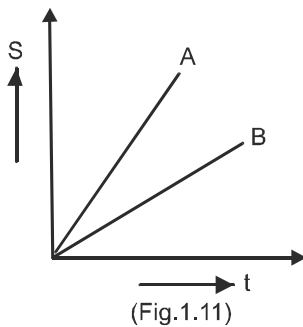
(Fig.1.11)

23. Displacement time graph of a body is shown in fig 1.13 then velocity of the body in the interval AB is:
   a) 1 m/s
   b) 2 m/s
   c) 4 m/s
   d) zero

(Fig.1.13)
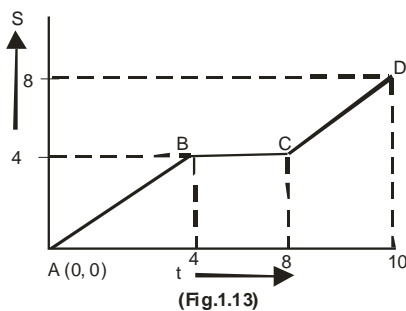
24. In Q. No. 23, the velocity of the body during BC is :
   a) 1 m/s
   b) zero
   c) 2 m/s
   d) 3 m/s

25. In Q. No. 23, the displacement of the body at 7th second is :
   a) 2m
   b) 3m
   c) 4m
   d) 8m

26. The area under acceleration time graph represents :
   a) Displacement
   b) Velocity
   c) Distance covered
   d) Change in velocity

27. Velocity time graph of a car moving in a straight line is shown in fig 1.14. Then displacement of the car in 20 sec is :
   a) 20m
   b) 120m
   c) 160m
   d) 90m

(Fig.1.14)
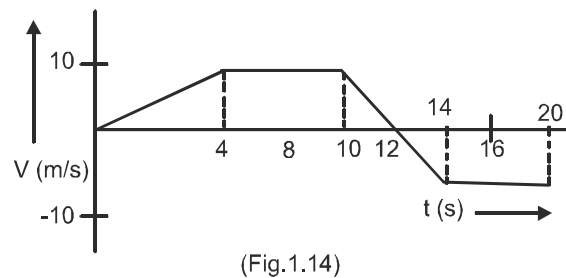
28. In Q. No. 27, distance travelled by the body is :
   a) 20m
   b) 120m
   c) 160m
   d) none of these

29. A ball is dropped from the top of a building 100 m high. At the same instant another ball is projected upwards with a velocity of 40 m/s from the bottom. Then the time after which the two balls meet is :
   a) 5 s
   b) 2.5 s
   c) 4 s
   d) 2 s

30. A stone dropped from the top of a tower reaches the ground in 2 sec. The height of the tower is :
    a) 17.8m
    b) 19.6m
    c) 78.4m
    d) 117.6m

31. Angular displacement is:-
    a) A scalar
    b) A vector
    c) either a scalar or a vector
    d) none of the above

32. A ball is thrown upwards with a velocity of 50 m/s. It reaches the ground in time (take $g = 10$ m/s^2)
    a) 20 sec
    b) 10 sec
    c) 30 sec
    d) 40 sec

33. A wooden ball and an iron ball, both of same radius, are released from a certain height in vaccum. Then time taken by both of them to reach the ground is:
    a) unequal
    b) roughly equal
    c) exactly equal
    d) can't say, data is insufficient.

34. A man can through a stone to maximun distance of 80m. The maximum hight to which it will rise in meter is
    a) 10
    b) 20
    c) 30
    d) 40

35. The ratio of numerical values of average velocity and average speed of the body is always :
    a) unity
    b) less then unity
    c) unity or more
    d) unity or less

36. When a constant force is applied to a particle, it moves from rest upto 20sec. If distance covered in first 10 sec is S_1 and that covered in next 10 sec is S_2, then :
    a) $S_1 = S_2$
    b) $S_2 = 2S_1$
    c) $S_2 = 3S_1$
    d) $S_2 = 4S_1$

37. A car is moving at a speed of 50km /hrs. it can be stopped by a applying brakes within a distance of 6m. Now if the same car move at a speed of 100km/hrs. then minimum distance in which it can be stopped is :-
    a) 6m
    b) 12m
    c) 18m
    d) 24m

38. In Q. 40, What will be the displacement of the body:
    a) 100m
    b) 125m
    c) 160m
    d) 225m

39. What determine the nature of path followed by a partical
    a) velocity
    b) speed
    c) acceleration
    d) none of the above

40. Which one of the following is correct eq. :
    a) $v^2 = u^2 - 2as$
    b) $v^2 - u^2 = 2as$
    c) $v^3 - u^2 = 2as$
    d) $v - u = 2as$

41. A body travels from position A to position B with a velocity of 30 m/s and returns from B to A with a velocity of 40 m/s. Then average speed of the body is :
    a) 25m/s
    b) 35 m/s
    c) 45 m/s
    d) 70 m/s

42. A cyclist moving on a circular track of radius 40m complete half revolution in 40 s. Its average velocity is:
    a) Zero
    b) 4π m/s
    c) 2 m/s
    d) 8π m/s

43. The speed of a car increases from 1 m/sec to 2 m/sec in 10 seconds. Then its acceleration is :
    a) 1m/s^2
    b) 2m/s^2
    c) 3 m/s^2
    d) 4m/s^2

44. Displacement time graphs for two particle A and B are straight lines inclined at angles of 30° and 60° to the time axis. Then ratio of velocities – $V_A : V_B$ is :

a) 1:2

b) 1: $\sqrt{3}$

c) $\sqrt{3}$:1

d) 1:3

45. A stone dropped from the top of a tower reaches the ground in 4 sec. The height of the tower is :
   a) 27.8m
   b) 39.2m
   c) 78.4m
   d) 117.6m

46. Initial velocity of a body is 7 m/s and it moves with a uniform acceleration of $4m/s^2$.Then distance covered by the body in 5 sec. is
   a) 67m
   b) 62m
   c) 80m
   d) 60m

47. A ball is thrown upwards with a velocity of 100 m/s. It reaches the ground in time (take g = 10 m/s²)
   a) 10 sec
   b) 20 sec
   c) 30 sec
   d) 40 sec

48. A body is projected at an angle of 30^0 to the horizontal with kinetic energy E. The K.E. at topmost point is:-
   a) zero
   b) E/4
   c) E/2
   d) 3E/4

49. A body is projected: horizontaly with the speed of 20m/s from top of tower, what will be its speed nearly after 5s? (g= 10m/s²)
   a) 54m/s
   b) 20m/s
   c) 50m/s
   d) 70m/s

50. Abullet on penetrating through a plank looses 1/20th of its velocity. If the bullet is to be completely stopped, then minimum number of planks required is :
   a) 11
   b) 13
   c) 15
   d) 17

51. A person sitting in a train moving with a constant velocity throws a ball vertically upwards, then ball will:
   a) fall in front of the brain
   b) return to the person
   c) fall backward
   d) none of these

ANSWERS

1 b	2 a	3 a	4 b	5 a
6 c	7 a	8 c	9 a	10 b
11 a	12 a	13 a	14 d	15 a
16 b	17 c	18 a	19 a	20 c
21 b	22 a	23 a	24 b	25 c
26 b	27 a	28 c	29 c	30 b
31 c	32 b	33 c	34 b	35 d
36 c	37 d	38 c	39 a	40 b
41 b	42 c	43 a	44 d	45 c
46 d	47 b	48 d	49 a	50 a
51 b				

CHAPTER - 10
FORCE

Multiple Choice Questions

1. A bomb of mass 20gm strikes a target with velocity of 500 cms⁻¹. If the resisting force is 10^4 dynes, The bullet will penetrate through:
   a) 2.5 m b) 250 m
   c) 8 cm d) 2.5 cm

2. The property of a body due to which it can not change its state of rest or uniform motion by itself is called :
   a) Inertia b) Force
   c) Momentum d) Impulse

3. A player caught a cricket ball of mass 150 g moving at the rate of 20m/s. If the catching process is completed in 0.1s , the foce of below exerted by the ball on the hand of the player is :-
   a) 3N b) 30N
   c) 150N d) 300 N

4. The resultant of two forces acting on a body along the same direction is 50 N. One of the force is 32 N, then the other force is :
   a) 18 N b) 82 N
   c) 41 N d) 40 N

5. Linear momentum is :
   a) a vector quantity
   b) a scalar quantity
   c) Neither a scalar nor a vector
   d) May be scalar or vector

6. Impulse is :
   a) a scalar quantity
   b) a vector quantity
   c) Neither a scalar nor a vector
   d) May be scalar or a vector

7. When a body of mass 1 kg is acted upon by a force of IN, then the body receives :
   a) a speed of 1 m/s
   b) an acceleration of 1 m/s²
   c) an acceleration of 9.8 m/s²
   d) an acceleration of 1 cm/s²

8. Inertia of a body depends upon :
   a) velocity b) mass
   c) area d) volume

9. A body of mass 4 kg is sliding on a frictionless horizontal table with a constant velocity of 4 ms⁻¹. The force required to keep the body moving with the same velocity is :
   a) Zero N b) 8 N
   c) 16 N d) 32 N

10. Product of mass of body and its velocity is a term called:-
    a) impulse b) energy
    c) momentum d) intertia

11. A player kicks a 1 kg football at rest and gives it a velocity of 5 m/s. If the time of contact between ball and the player is 1/50 sec, then force of impact is :
    a) 250 N b) 500 N
    c) 1200 N d) 2500 N

12. Which of the following has the maximum momentum?
    a) A 100 kg vehicle moving at 0.01 m/s
    b) A 10 g weight moving at 1000 cm/s
    c) A 100 g weight moving with kinetic energy of 10^{-4}J
    d) A 40 g weight after falling through 1000 m.

13. If weight of a body is 100newton, then mass of a body will be (take g = 10m/S^2)
    a) 10^{-1}kg b) 10^2kg
    c) 10kg d) 10^4kg

14. A body of mass 4 kg moving on a horizontal surface with an initial velocity of 6 m/

s.comes to rest after 3s. If one want to keep the body moving on the same surface with the velocity of 6m/s the force required is:
a) zero
b) 4 N
c) 8N
d) 16N

15. When a body is stationary:
a) No force acts on it
b) Forces acting are not in contact with the body
c) Body is not in any medium
d) The forces acting on it are in equilibrium

16. We can derive Newton's _____ and _____ laws from _____ law.
a) First, Third, Second
b) Third, Second, First
c) First, Second, Third
d) None of these.

17. A rocket works on the principle of :
a) Conservation of angular momentum
b) Conservation of mass
c) Conservation of linear momentum
d) Conservation of energy

18. Conservation of linear momentum is equivalent to:
a) Newton's 1st law of motion
b) Newton's 2nd law of motion
c) Newton's third law of motion
d) None of these

19. Inertia is a _____ of body :
a) mass
b) property
c) distance
d) displacement

20. A force of 5 N acts on a body of weight 18.6 N. The acceleration produced in the body is:
a) 9.8 N
b) 6 N
c) 5 N
d) 1.96 N

21. When a cart is pulled by a horse, the force that causes the horse to move forward is the force that
a) The horse exerts on cart

b) Cart exerts on horse
c) Horse exerts on ground
d) Ground exerts on horse

22. A body of mass 5 kg moving with a velocity of 10 m/s collides with a body of mass 5 kg at rest. Both bodies stick together after collision. Then velocity of the compound body is
a) 5 ms^{-1}
b) 3 ms^{-1}
c) 4 ms^{-1}
d) 6 ms^{-1}

23. One gwt is equal to :
a) 1 N
b) 9.8 N
c) 980 dyne
d) 9.8 dyne

24. A man is standing on a boat in still water. If the man walks towards the shore than boat will move away from shore
a) Newton 3rd law of motion
b) Newton 2nd law of motion
c) move towards shore
d) none of these

25. A 50 kg body is acted upon by a force and its speed changes from 30 m/s to 40 m/s. Then increase in its momentum is :
a) 500 kg ms^{-1}
b) 600 kg ms^{-1}
c) 150 kg ms^{-1}
d) 200 kg ms^{-1}

26. What force will change the velocity of a body of mass 1kg from 20 m/s in one seconds :
a) 1 N
b) 5N
c) 20 N
d) 25 N

27. A bullet of mass 10 gm is fired from a gun of mass 5 kg. If the speed of the bullet is 500 ms^{-1}, then speed of the gun is :
a) - 1.25 ms^{-1}
b) + 1.25 ms^{-1}
c) - 1.0 ms^{-1}
d) + 1.5 ms^{-1}

28. A boy of mass 60 kg is moving with a velocity of 10 ms^{-1}. Then momentum of the body is :
a) 70 kg ms^{-1}
b) 900 kg ms^{-1}
c) 100 kg ms^{-1}
d) 600 kg ms^{-1}

29. Momentum is a measure of :
    a) mass b) weight
    c) quantity of motion
    d) acceleration

30. Impulse has same units as :
    a) momentum b) force
    c) angular momentum d) time

31. It is difficult to walk on ice because of absence of:
    a) inertia b) friction
    c) Internal force d) None of these

32. Internal forces:
    a) are always balanced
    b) are always unbalanced
    c) may or may not be balanced
    d) none of these

33. When a force of 2N acts on a mass of 2kg then acceleration is :
    a) 10 m/s^2 b) 5 m/s^2
    c) 2.5 m/s^2 d) 1 m/s^2

34. A man in lift will weight more, whenn :
    a) Lift accelerates upward
    b) Lift accelerates downward
    c) Lift descends freely
    d) The lift going up is slowing down.

35. The ratio of CGS units to SI units of density is :
    a) 10^{-4} b) 10^{-3}
    c) 10^{-5} d) 10^{-2}

36. 1 N is equal :
    a) 10 dyne b) 10^{-1}dyne
    c) 10^5 dyne d) 10^{-5} dyne

37. A cricketer catches a ball of mass 300 gm moving with a speed of 10 m/s in a time of 0.1 sec. The force experienced by him is :
    a) 300 N b) 30 N
    c) 3 N d) 0.03 N

38. A force of 20 N acts on a body of mass 30 kg for 5 seconds. Then change in its momentum is :
    a) 1000 kg ms^{-1} b) 500 kg ms^{-1}
    c) 250 kg ms^{-1} d) 100 kg ms^{-1}

39. Which is suitable method to decrease friction
    a) Polishing b) Lubrication
    c) Ball bearing d) All of these

40. Force is a :
    a) scalar quantity b) vector quantity
    c) both
    d) none of these

41. The resultant of two forces acting on a body along the opposite direction is 50 N. One of the force is 32 N, then the other force is :
    a) 82 N b) 18 N
    c) 41 N d) 40 N

42. When a body of mass 1 kg is acted upon by a force of 9.8N, then the body receives :
    a) a speed of 1 m/s
    b) an acceleration of 1 m/s^2
    c) an acceleration of 9.8 m/s^2
    d) an acceleration of 1 cm/s^2

43. If weight of a body is 1000 dyne, then mass of a body will be (take g = 10m/S^2)
    a) 10^{-1}kg b) 10^{-2}kg
    c) 10^{-3}kg d) 10^{-4}kg

44. A ship of mass 2x10^7 kg is displaced through 25 m when a force of 25x10^5 N acts on it. Then velocity of the ship is :
    a) 12.5 m/s b) 5.0 m/s
    c) 3 m/s d) 2.5 m/s

45. A 5 kg body is acted upon by a force and its speed changes from 30 m/s to 40 m/s. Then increase in its momentum is :
    a) 50 kg ms^{-1} b) 100 kg ms^{-1}
    c) 150 kg ms^{-1} d) 200 kg ms^{-1}

46. A man of weight mg is moving upward in a rocket with acceleration 4 timeg. His apparent weight inside the rocket will be :
a) zero
b) 4mg
c) 5mg
d) 1mg

47. A cricketer catches a ball of mass 150 gm moving with a speed of 20 m/s in a time of 0.1 sec. The force experienced by him is :
a) 300 N
b) 30 N
c) 3 N
d) 0.03 N

48. A force of 10 N acts on a body of mass 20 kg for 10 seconds. Then change in its momentum is :
a) 1000 kg ms^{-1}
b) 500 kg ms^{-1}
c) 250 kg ms^{-1}
d) 100 kg ms^{-1}

49. A book is lying on the table. Then angle between action of the book on the table and reaction of the table on the book is :
a) zero
b) 60º
c) 90º
d) 180º

50. Maximum force of friction is called :
a) static friction
b) dynamic friction
c) limiting friction
d) sliding friction

Key

1 a	2 a	3 b	4 a	5 a	6 b
7 b	8 b	9 a	10 c	11 a	12 d
13 c	14 c	15 d	16 b	17 c	18 b
19 b	20 c	21 b	22 a	23 c	24 a
25 a	26 c	27 c	28 d	29 c	30 a
31 a	32 a	33 d	34 a	35 a	36 c
37 b	38 d	39 d	40 b	41 a	42 c
43 c	44 d	45 a	46 d	47 b	48 d
49 d	50 c				

CHAPTER - 12

GRAVITATION

Multiple choice Questions

1. Value of Gravitational constant is :
   a) 6.67×10^{-11} Nm^2 kg^{-2}
   b) 66.7×10^{-11} Nm^2 kg^{-2}
   c) 667×10^{-11} Nm^2 kg^{-2}
   d) None of these

2. If the earth stops rotating, the value of 'g' at the equator will :
   a) Increase
   b) remain same
   c) decrease
   d) none of these

3. The velocity of a stone of mass 1kg thrown vertically upward is 9.6ms^{-1}. The maximum height to which stone will rise is :
   a) 9.8 m
   b) 19.6 m
   c) 39.9 m
   d) 4.9 m

4. Newton's law of gravitation is given by :
   a) $F = \dfrac{GM_1}{R^2}$
   b) $F = \dfrac{Gm_1 m_2}{R^2}$
   c) $G = \dfrac{Fm_2 m_2}{R^2}$
   d) $F = \dfrac{Rm_2 m_2}{G^2}$

5. The law of gravitation was given by :
   a) Copernicus
   b) Galileo
   c) Newton
   d) Archimedes

6. SI unit of G is :
   a) N^{2}m^2 kg^{-1}
   b) Nm kg^{-1}
   c) Nm^2 kg^{-2}
   d) Nm^2 kg^{-1}

7. SI unit of g is :
   a) ms^{-2}
   b) m^{2}s^{-1}
   c) sm^{-2}
   d) ms^{-1}

8. The maximum weight of a body is :
   a) at the centre of the earth
   b) inside the earth
   c) on the surface of the earth
   d) above the surface of the earth

9. If the distance between two masses is half, then the force between them will become :
   a) 1/4 times
   b) 2 times
   c) 4 times
   d) ½ times

10. The unit of G/g:
    a) Kg/m
    b) Kg/m^2
    c) m^2/Kg
    d) m/Kg

11. A body falls freely towards the earth with :
    a) uniform speed
    b) uniform velocity
    c) uniform acceleration
    d) none of these.

12. If mass of a body is M on the surface of earth, then its mass on the surface of moon is :
    a) M/6
    b) M x 6
    c) M + 6
    d) M

13. The value of acceleration due to gravity near the earth's surface is :
    a) 9.8 m/s^2
    b) 8.9 m/s^2
    c) 1/6x9.8 m/s^2
    d) 5.9 m/s^2

14. The force of gravitation exists:
    a) every where in the universe
    b) inside the earth
    c) on the surface of the earth
    d) on moon

15. If a body of mass 10 Kg is taken to the centre of earth, its weight will be :
    a) zero
    b) infinity
    c) 98 N
    d) 980 N

16. 1 N is approximately equal to
    a) 1.0 kg wt
    b) 1/9.8 kg wt
    c) 9.8 kg wt
    d) None of these

17. As a person moves from pole to equator the value of its weight will :

a) Increase
b) Decrease
c) Remain same
d) first decrease then increase

18. Mass is measured by :
a) Beam balance
b) Spring balance
c) Atomic scale
d) None of these

19. Weight is measured by :
a) Beam balance   b) Spring balance
c) Atomic scale   d) None of these

20. Weight of a body is 186 N. Then its mass is:
a) 98 kg   b) 186 kg
c) 20 kg   d) 1 kg

21. Two bodies of masses 10 kg each are placed 1 meter apart. Then the force of attraction between them is :
a) 667 N   b) 6.67×10^{-7} N
c) 6.67×10^{-9} N   d) 6.67×10^{-11} N

22. The mass and diameter of a planet are twice that on the earth. The value of acceleration due to gravity on the planet is :
a) 19.6 m/s^2 b) 9.8 m/s^2
c) 4.9 m/s^2 d) 2.45 m/s^2

23. As one moves from equator to the poles, the value of acceleration due to gravity "g":
a) increases
b) decreases
c) decreases up to some latitude
d) none of these

24. An astronaut orbiting around the earth in a space ship experiences
a) lesser weight   b) more weight
c) weightlessness   d) none of these

25. The time period of an artificial satellite is :
a) 27 days   b) 24 days
c) 365 days   d) 24 hours

26. The value of g varies with depth inside the earth as :
a) $g\alpha \dfrac{1}{r^2}$ b) g α r
c) g α r^2 d) g α r^{-1}

27. The value of g varies with height above the surface of earth as
a) $g\alpha \dfrac{1}{r^2}$ b) g α r
c) g α r^2 d) g α r^{-1}

28. For a freely falling body, the apparent weight of the body is :
a) Increase   b) Decrease
c) Zero
d) Remain same

29. If the radius of earth's orbit becomes $\frac{1}{4}$th, then duration of an year will becomes:
a) $\frac{1}{4}$ times   b) $\frac{1}{8}$ times
c) 4 times   d) 8 times

30. If earth suddenly shrinks to half the present radius, then acceleration due to gravity becomes :
a) $\dfrac{g}{2}$ b) $\dfrac{g}{4}$
c) 2g   d) 4g

31. If earth suddenly shrinks by one third of its present radius, the acceleration due to gravity will be
a) 2g   b) 3g
c) 8g   d) 9g

32. A simple pendulum is taken from the equator to the poles. Its time period :
a) Increases   b) Decreases
c) Remains same
d) First increases and then decreases

33. Time period of simple pendulum is depend on :
    a) Only L
    b) Only g
    c) Both L and g
    d) None of these

34. If a watch with wound spring is taken to the moon, it will run :
    a) slower
    b) faster
    c) sometimes slower some times faster
    d) with same time period

35. Intensity of gravitational field of earth is maximum at:
    a) Poles
    b) eqator
    c) Centre of earth
    d) same every where

36. Time period of second pedulum:-
    a) 2s
    b) 3s
    c) 1s
    d) 0s

37. The value of gravitational constant 'G' was determined by :
    a) Sir Airy
    b) Faraday
    c) Newton
    d) Cavendish

38. Ratio of acceleration due gravity on moon to that on earth is
    a) 6 : 1
    b) 9.8 : 1
    c) 1 : 9.8
    d) 1 : 6

39. The value of G does not depend upon:
    a) size and shape of the interacting bodies
    b) mass of the interacting bodies
    c) nature of the medium between the interacting bodies
    d) all the above

40. The Force of attraction between two bodies of masses 1 kg each at distance of 1 m apart is
    a) 6.67×10^{-11}
    b) 66.7×10^{-11}
    c) 667×10^{-11}
    d) None of these

41. The weight of the body at the center of the earth is
    a) 9.8
    b) 0
    c) 10
    d) 98

42. Complete the gravitational force of attraction between two ball of mass 5 kg each, seperated by half metre is
    a) 6.67×10^{-9}
    b) 66.7×10^{-9}
    c) 667×10^{-11}
    d) None of these

43. Force of attraction between earth and a body of mass 1 kg is
    a) 98 N
    b) 980 N
    c) 9.8 N
    d) 0.98 N

44. 1 kg weight is equal to
    a) 9.8 N
    b) 980 N
    c) 98 N
    d) .98 N

45. The gravitaional force between two bodies is always
    a) Repulsive
    b) Attractive
    c) Both
    d) None of these

Answers

1 a	2 a	3 b	4 b	5 c	6 c
7 a	8 c	9 c	10 c	11 c	12 d
13 a	14 a	15 a	16 b	17 b	18 a
19 b	20 c	21 c	22 c	23 a	24 c
25 d	26 b	27 a	28 c	29 b	30 d
31 d	32 b	33 c	34 d	35 a	36 a
37 d	38 d	39 d	40 a	41 b	42 a
43 c	44 a	45 b			

CHAPTER - 11
WORK, POWER & ENERGY

Multiple Choice Questions

1. A force of 50N is inclined at an angle of 30° to the direction of motion of a body through distance 5m. The work done by the force is:
   a) $125\sqrt{3}$ J
   b) $125\sqrt{2}$ J
   c) 250 J
   d) 125 J

2. If the velocity of a body become double, its kinetic energy will become:
   a) four time
   b) twice
   c) one fourth
   d) half

3. If mass of a body is doubled by keeping its velocity same, the K.E will be :
   a) 2 times the original value
   b) 4 times the original value
   c) 8 times the original value
   d) same as before

4. A force of friction of 100 N acts on a cyclist. The cyclist moves with a velocity of 1ms⁻¹. The power of cyclist will be :
   a) 200 W
   b) 100 W
   c) 300 W
   d) 400 W

5. Work done by a force acting upon a body is:
   a) always positive
   b) always negative
   c) a scalar quantity
   d) a vector quantity

6. SI unit of work is :
   a) erg
   b) Joule
   c) erg s
   d) Js⁻¹

7. Ratio of CGS to SI unit of work is
   a) 10^{-3}
   b) 10^{-4}
   c) 10^{-5}
   d) 10^{-7}

8. 1 H.P. is equal to :
   a) 546 w
   b) 646 w
   c) 746 w
   d) 846 w

9. Kilowatt hour (kWh) is the unit of
   a) momentum
   b) impulse
   c) power
   d) none of these

10. 1 KWh is equal to _____ Joules.
    a) 3.6×10^6
    b) 3.6×10^5
    c) 3.6×10^4
    d) 3.6×10^3

11. If the kinetic energy of 1 Kg mass is 8J.Its velocity is :
    a) 1 m/s
    b) 4 m/s
    c) 8 m/s
    d) 0.1 m/s

12. A wound watch spring has :
    a) Both Kinetic and potential energy
    b) Only Kinetic energy
    c) Only potential energy
    d) Only chemical energy.

13. Product of force and velocity is :
    a) energy
    b) momentum
    c) work
    d) power

14. Work done is equal to the product of force and
    a) distance
    b) speed
    c) displacement
    d) acceleration

15. When speed of a body is doubled, its K.E. become——— times the original value.
    a) 1/2
    b) 4
    c) 2
    d) 1/4

16. A 100 kg body is lifted through a height of 2 m. Then work done is (g = 10ms⁻²)
    a)100J
    b) 200J
    c)1000J
    d) 2000J

17. Area under force- displacement graph is equal to :
    a) impulse
    b) momentum
    c) work done
    d) none of these

18. A body at rest may have :
    a) energy
    b) momentum
    c) speed
    d) velocity

19. Work done by a body in moving along a circular path is :
    a) Zero
    b) positive
    c) negative
    d) can't say.

20. A body of man 40 kg is dropped from a height of 2m. Kinetic energy of the body when it strikes the ground is (take g = 10 ms^{-2})
    a) 80 J
    b) 400 J
    c) 600 J
    d) 800J

21. 1erg = ------------- J
    a) 10^5
    b) 10^8
    c) 10^7
    d) 10^{-7}

22. A body of mass 200g possesses a k.e. of 10 J. Then momentum of the body is.
    a) 2kg ms^{-1}
    b) 2 g cms^{-1}
    c) 1/2 kg ms^{-1}
    d) 1/2 g cms^{-1}

23. When a hammer is raised, it possesses :
    a) Electrical energy
    b) gravitational potential energy
    c) Kinetic energy
    d) Heat energy.

24. If Kinetic energy of a body increases by 100%, then its momentum will increase by:
    a) 20%
    b) 40 %
    c) 60 %
    d) 100%

25. The momentum of a body is numerically equal to its twice the kinetic energy. Then velocity of the body is :
    a) Zero
    b) 2m/s
    c) 1m/s
    d) 4 m/s

26. Radha weight 600N climbs the stair from the basement to her study room 10m above in 20 s. What power does she develop ?:
    a) 670 W
    b) 140W
    c) 300 W
    d) 150 W

27. A body of mass 60 kg has a momentum of 360 kg ms^{-1}. Speed of the body is:
    a) 6 m/s
    b) 5 m/s
    c) 3 m/s
    d) 2 m/s

28. In Q. No. 24 Kinetic Energy of the body is:
    a) 3.08×10^5J
    b) 2.08×10^5 J
    c) 1.08×10^5 J
    d) 0.08×10^4J

29. Two bodies of masses m_1 and m_2 have equal momenta. If E_1 and E_2 are their respective kinectic energy. The ratio of E_1 : E_2 is:-
    a) $m_1 : m_2$
    b) $m_2 : m_1$
    c) $\sqrt{m_1} : \sqrt{m_2}$
    d) $m_1^2 : m_2^2$

30. A horizontal force of 10N pulls a box along a table. How much work does it do in pulling the box 50cm.
    a) 5J
    b) 7J
    c) 21J
    d) 8.5J

31. A bullet losses half its velocity on penetrating 3 m in a wooden block, then how much more will it penetrate before coming to rest ?
    a) 1m
    b) 2m
    c) 3 m
    d) 4 m.

32. A ball having kinetic energy K is projected at an angle of 45° to the horizontal. Then kinetic energy of the ball at the highest point of its flight will be :
    a) E^2
    b) $\dfrac{E}{2}$
    c) $\dfrac{E}{\sqrt{2}}$
    d) Zero

33. Which of the following is different from other

a) watt-sec   b) coulomb- volt
c) Newton- metre   d) Coulomb- Farad.

34. Joule is the unit of :
    a) power   b) energy
    c) force   d) momentum

35. A boy of weight 30kgs runs up a flight of 100 steps each 0.2m high in 20 sec. Then work done is :
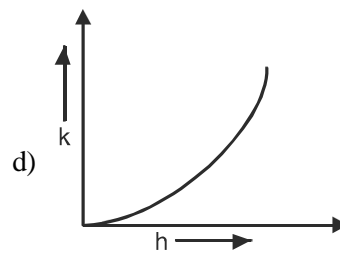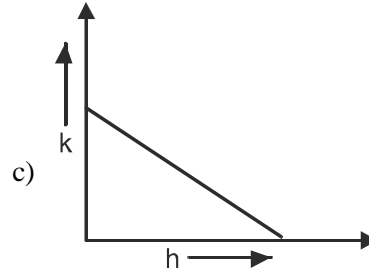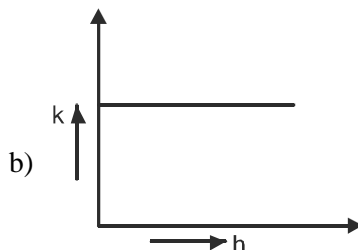   a) 2000 J   b) 4000 J
    c) 8000 J   d) 6000 J

36. In Q.No. 32, power of the boy is :
    a) 100 W   b) 200 W
    c) 400 W   d) 800 W

37. If the speed of a vehicle gets doubled then
    a) Weight is doubled
    b) acceleration is doubled
    c) Kinetic energy become four times
    d) Kinetic energy becomes twice.

38. The graph that represents kinetic energy of a freely falling body as a function of height is :

a)

b)

c)

d)
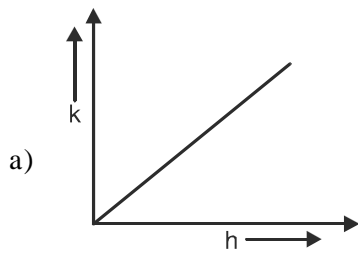
39. The relationship between kinetic energy "K" and linear momentum "P" is best given by
    a) $K = 2P^2/m$ b) $K = P^2/2\,m$
    c) $K = P^2/m$ d) $K = P/m$

40. A ball of mass 1 kg slow down from a speed of 5 m/s to that of 3 m/s. Thus the change in kinetic energy of the ball is :
    a) 2J   b) 8 J
    c) 4 J   d) 6J

41. A force of 100N is inclined at an angle of 60° to the direction of motion of a body through distance 5m. The work done by the force is :

    a) $125\sqrt{3}$ J   b) $125\sqrt{2}$ J
    c) 250 J   d) 125 J

42. If the velocity of a body become half, its kinetic energy will become:
    a) four time   b) twice
    c) one fourth   d) half

43. Ratio of SI to CGS unit of work is
    a) 10^3
    b) 10^4
    c) 10^5
    d) 10^7

44. A milk man lift a case of milk bottles having a mass of 20 kg to a height of 3m into his truck. How much work does he do ? :
    a) 20 J
    b) 19 J
    c) 5.88×10^2 J
    d) 5.88×10^4 J

45. The four engine aeroplane developes a total of 150hp, when its velocity is 120m/s. The force which the engine exerts is:
    a) 3×10^4 N
    b) 9.3×10^2 N
    c) 7.2×10^5 N
    d) 2500 N

46. Two bodies A and B having masses in the ratio 9 : 4 possess the same kinetic energy. Then ratio of linear momentum of A to B is:
    a) $1 : \sqrt{3}$
    b) 2 : 4
    c) 1 : 3
    d) 3 : 1

47. A body of mass 60 kg has a momentum of 3600 kg ms^{-1}. Speed of the body is:
    a) 60 m/s
    b) 50 m/s
    c) 30 m/s
    d) 20 m/s

48. A ball having kinetic energy K is projected at an angle of $60°$ to the horizontal. Then kinetic energy of the ball at the highest point of its flight will be :
    a) E^2
    b) E/4
    c) $\dfrac{E}{\sqrt{2}}$
    d) Zero

49 Potential energy can not be expressed in
    a) J
    b) Nm
    c) WS
    d) NS

50. A body moving with a uniform velocity of 40 m/s has a frictional force of 20 kgf acting on it. Then work done against friction is:
    a) 4000 J
    b) 6000 J
    c) 8000 J
    d) none of these

51 Joule per second is the unit of
    a) Power
    b) Energy
    c) Work
    d) Momentum

Answers

| 1 a	2 a	3 a	4 b	5 c	6 b	7 d
8 c	9 d	10 a	11 b	12 c	13 d	14 c
15 b	16 d	17 c	18 a	19 a	20 d	21 d
22 a	23 b	24 b	25 c	26 c	27 a	28 c
29 d	30 a	31 c	32 b	33 d	34 b	35 d
36 c	37 c	38 a	39 b	40 b	41 c	42 c
43 d	44 c	45 b	46 b	47 a	48 b	
49 d	50 c	51 a				

CHAPTER - 12
HEAT

1. At what temperature, the molecules of a gas have zero K.E. :
   a) -273°C   b) 273°C
   c) 0°C   d) 100°C

2. Water has maximum density and least volume at : :
   a) 273^0 k   b) 4^0 C
   c) 1^0 C   d) 2^0 C

3. Water is used as a coolant because of its :
   a) lower density
   b) easy availability
   c) high specific heat
   d) high specific heat

4. One calorie is equivalent to :
   a) 4.186 J   b) 4.186×10^3 J
   c) $\dfrac{1}{4.186}$ J   d) None of these

5. If temperature scale is changed from C to F, numerical value of specific heat will :
   a) increase   b) decrease
   c) remain same   d) cannot say

6. The temperature of a body measures
   a) amount of heat
   b) heat   c) energy
   d) degrees of hotness

7. Temperature of a body is measured by the instrument called
   a) Potentiometer   b) Thermometer
   c) Barometer   d) manometer.

8. According to kinetic theory, heat of a body is
   a) total energy of all molecules
   b) average energy of all molecules
   c) total velocity of all molecules
   d) average kinetic energy of all molecules.

9. According to kinetic theory, temperature of a body is
   a) total energy of all molecules
   b) average energy of all molecules
   c) total velocity of all molecules
   d) average kinetic energy of all molecules

10. The normal temperature of human body in degree centigrade is
    a) 36°   b) 37°
    c) 38°   d) 39°

11. If relative humidity is high
    a) we perspire less
    b) we feel uncomfortable
    c) clothes do not dry early
    d) all of these.

12. A graph that correctly depicts the relationship between of ^{0}F scale and ^{0}C scale is

a)

b)

c)

d)
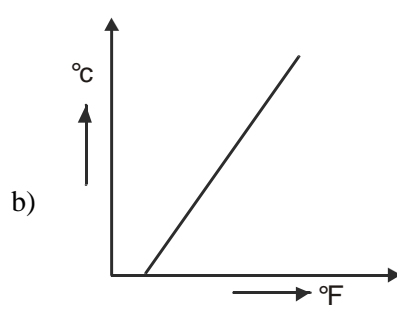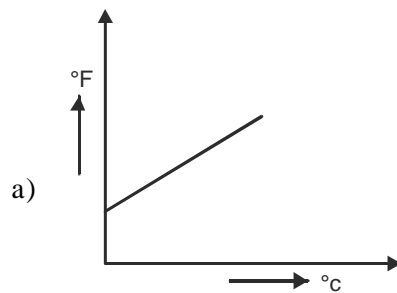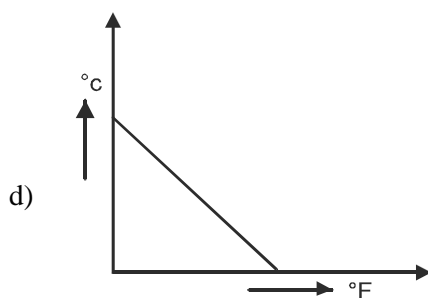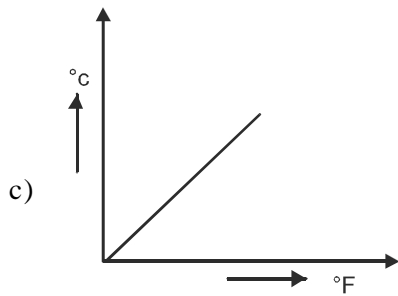
13. The most commonly used thermometric liquid is
    a) Alcohol   b) Mercury
    c) Water   d) Kerosene.

14. Boiling water is changing into steam. The specific heat of boiling water is :
    a) zero   b) one
    c) infinity   d) less than one

15. The quantity of heat required to raise the temperature of 1 litre of water from 20ºC to 60ºC is:
    a) 40 cal   b) 4000 cal
    c) 40 000 cal   d) 80000 cal.

16. Heat flows because of the difference of
    a) mass   b) weight
    c) temperature   d) none of these.

17. Unit of specific heat capacity is :
    a) cal g^{-1} b) cal $g^{-1}{}^{\circ}c^{-1}$
    c) cal $^{\circ}c^{-1}$ d) cal.

18. Latent heat has the units
    a) cal g^{-1} b) cal$^{\circ}c^{-1}$
    c) cal g   d) cal.

19. One joule is equal to :
    a) 2.4 cal   b) 4.2 cal
    c) 3.2 cal   d) 2.3 cal.

20. Two bodies x and y are said to be in thermal equilibrium with each other if
    a) heat flows from A to B
    b) heat flows from B to A
    c) Both A and B loose same heat
    d) there is no flow of heat in between A and B.

21. Total number of divisions on Fahrenheit scale is :
    a) 32   b) 100
    c) 180   d) 212

22. One gram of ice at 0°C is added to 5 gram of water at 10°C. Final temperature of mixture is :
    a) -5°C   b) 5°C
    c) 0°C   d) none of these

23. Water is used for fomentation because it has
    a) high specific heat capacity
    b) low specific heat capacity
    c) easy availability
    d) high boiling point.

24. The temperature at which both Celsius and Fahrenheit scales show same reading is :
    a) -30°   b) -40°
    c) -50°   d) -60°

25. 540g of ice at 0⁰C is mixed with 540 g of water at 80ºC. Then final temperature of the mixture is:
    a) 40ºC   b) 0ºC
    c) 70° C   d) 80ºC

26. One mole of a gas enclosed in vessel is heated at constant pressure through 1°k. Work done by the gas is

a) 1 J
b) 1/R J
c) R J
d) none of these

27. Absolute zero corresponds to :
a) 273°C
b) 273°R
c) -273°C
d) 289 k

28. If m is the mass, θ is temperature and C is specific heat capacity, then thermal capacity is given by
a*)* mθ
b*)* mCθ
c*)* mC/θ
d*)* mC

29. No. of division on celsius scale is:
a) 32
b) 100
c) 180
d) 212

30. One gm of ice and one gm of water are heated separately. Which takes more time to raise the temperature by 1°C
a) both take same time
b) ice takes more time
c) water takes more time
d) none of these

31. Work required to generate 1Kcal of heat is:
a) 4.2 J
b) 4.2 x 10^7 J
c) 4.2 x 10^3J
d) none of these

32. The snow on mountains does not melt all at once when heated by sun because it
a) has high latent heat of fusion
b) has high latent heat of vapourisation
c) has high specific heat capacity
d) has low specific heat capacity.

33. Coefficient of cubical expansion of water is minimum at :
a) 0°C
b) 4°C
c) 15.5°C
d) 100°C

34. Ten moles of an ideal gas at constant temperature 600K is compressed from 100 litre to 10 litre. The work done in the process is :
a) 4.11x 10^4J
b) 4.11x 10^4J
c) 11.4 x 10^4J
d) -11.4 x 10^4J

35. If amount of heat given to system be 50 J and work done on the system be15 J, then change in internal energy of the system is :
a) 35 J
b) 50 J
c) 65 J
d) 15 J

36. Land and sea breeze occur due to
a) high specific heat of soil
b) high boiling point of water
c) high specific heat capacity of water
d) all the above.

37. SI unit of coefficient of linear expansion is :
a) °C
b) $^0C^{-1}$
c) cm/ ^0C
d) ^0C /cm

38. When the door of a refrigerator in a room is kept open, the temperature of room:
a) decrease
b) increase
c) remain constant
d) cannot say

39. Absolute zero is the temperature at which :
a) ice melts
b) All gases become liquids
c) molecular motion ceases
d) solid melts into liquid.

40. Absolute zeo temperature when expressed in centigrade scale is :
a) 0°C
b) 100°C
c) 273°C
d) -273° C

41. Addition of impurity to water causes its boiling point to
a) rise
b) fall
c) first rise than fall
d) have no change.

42. Relation between coefficient of linear, superficial and cubical expansion is correct:
a) $\alpha = \beta = \gamma$
b) $6\alpha = 3\beta = 2\gamma$
c) $\alpha = 2\beta = 3\gamma$
d) $-\alpha = -\beta = -\gamma$

43. When salt is properly mixed with ice, the melting point of ice
    a) is raised   b) is lowered
    c) remains same
    d) none of these

44. If a substance contracts on heating its coefficient of linear expansion is :
    a) positive   b) negative
    c) Zero   d) infinite

45. The first thermometer was developed by
    a) Joule   b) Fahrenheit
    c) Galileo   d) Watt.

46. Evaporation is the process of change of liquid into vapour
    a) at boiling point
    b) at any temperature
    c) above boiling point
    d) below boiling point.

47. The temperature of the bottom of a lake frozen at the upper surface will be
    a) 0^oC b) 2^oC
    c) -4^oC d) 4^oC

48. Relatioship between ^oC , ^oF and kelvin scale is:-
    a) $C = F = K$
    b) $\dfrac{C}{5} = \dfrac{F - 32}{9} = \dfrac{K - 273}{5}$
    c) $\dfrac{C}{5} = \dfrac{F - 32}{5} = \dfrac{K - 273}{5}$
    d) $\dfrac{C}{5} = \dfrac{F + 32}{5} = \dfrac{K + 273}{5}$

49. Water is used to cool the radiators of engines in motor cars because of its,
    a) high specific heat
    b) low specific heat
    c) high density
    d) low density

50. We feel comfortable under fan because :
    a) it gives cool air
    b) it evaporates sweat
    c) heat radiated by body increases
    d) none of these.

51. When air is saturated, it cannot hold
    a) more water vapour
    b) more air
    c) more carbon dioxide
    d) more oxygen.

52. When it is raining, the dew point is
    a) 100^oC
    b) 50^oC
    c) room temperature
    d) 0^oC

53. A carnot engine whose source is at 400 k takes 200 cals of heat and rejectes 150 cals to sink. What is the temperature of sink:
    a) 800 k   b) 400 k
    c) 300 k   d) cannot say.

54. Change of which of the following parameters determines work done by a gas in adiabatic process ?
    a) volume   b) temperature
    c) pressure   d) none of these

55. The mass of steam at 100^oC required to raise the temperature of 200 g of water from 60^oC to 100^oC (Specific latent heat of steam = $2268 \ Jg^{-1}$)
    a) 148g   b) 296g
    c) 14.8 g   d) 29.6 g

56. The power of carnot engine is :
    a) maximum   b) zero
    c) 100   d) 50

57. When steam condenses into water its :
    a) temperature remains same
    b) heat gets dissipated
    c) temperature is increased
    d) temperature is decreased

58. A thermometer is marked wrongly as its lower fixed point as –5°C and upper fixed point as 90°C, when it read 50°C, the actual temperature is approximately
    a) 88° b) 78°
    c) 68° d) 58°

59. Relationship between coefficients of linear, superficial and cubical expansion is best depicted by
    a) $\alpha : \beta : \gamma :: 1 : 3 : 2$
    b) $\alpha : \beta : r :: 1 : 2 : 3$
    c) $\alpha : \beta : \gamma :: 3 : 2 : 1$
    d) $\alpha : \beta : \gamma :: 2 : 3 : 1$

60. The coefficient of performance of a refrigerater working between 10° C and 20° C is
    a) 28.3 b) 29.3
    c) 2
    d) cannot be calculated .

61. Latent heat of ice is :
    a) 800 cal g^{-1} b) 80 cal g^{-1}
    c) 332 cal g^{-1} d) 33.2 cal g^{-1}

62. Two spheres of same size are made of same metals but one is hollow and the other is solid. They are heated to the same temperature. Then
    a) Solid sphere expands more
    b) hollow sphere expands more
    c) Both spheres expand equally
    d) none of these.

63. In which of the process internal energy of a system remain constant :
    a) Isochoric
    b) Isobaric
    c) Isothermal
    d) Adoabatic.

64. Which of the following produces more burns
    a) boiling water at 100°C
    b) hot air at 100°C
    c) steam at 100°C
    d) sun rays at 100°C.

65. The units of relative humidity are :
    a) kg b) kg m^{-2}
    c) kg m^{-3} d) none of these

Answers

1 a	2 b	3 c	4 a	5 b	6 d	7 b	8 a
9 d	10 b	11 d	12 a	13 b	14 c	15 a	16 c
17 b	18 a	19 b	20 d	21 b	22 a	23 a	24 b
25 b	26 c	27 c	28 b	29 b	30 b	31 c	32 a
33 b	34 d	35 c	36 c	37 b	38 b	39 c	40 d
41 a	42 b	43 b	44 b	45 c	46 b	47 d	48 b
49 a	50 b	51 a	52 c	53 c	54 b	55 c	56 b
57 d	58 d	59 b	60 a	61 b	62 a	63 c	64 c
65 d							

CHAPTER - 13
WAVE MOTION AND SOUND

Multiple choice Questions

1. Light wave are :
   a) Longitudinal wave
   b) both longitudinal and transverse wave
   c) Transverse wave
   d) none of those

2. The velocity of radio waves is 3×10^8 ms^{-1}. A radio station broadcasts at 75m band. The frequency of the broadcasting station is :
   a) 4×10^7 Hz   b) 4×10^6 Hz
   c) 7.5×10^8 Hz   d) 75×10^6 Hz

3. In transverse waves, particles of the medium vibrate in direction which is :
   a) at right angles   b) parallel
   c) antiparallel   d) none of these

4. Velocity of sound in vaccume is
   a) zero   b) 332m/s
   c) 330m/s   d) 340m/s

5. For less displacement, time period of a normal pendulum depends upon :
   a) Size of bolo   b) Its length
   c) Its Amplitude   d) Mass of bob

6. The graph between T^2 and g for a simple pendulum is a
   a) parabola   b) hyperbola
   c) curve   d) straight line

7. The temprature at which speed of sound in air become double its value at 0°C is :
   a) 546°C   b) 819°C
   c) 273°C   d) 1092°C

8. Audible range of sound is:-
   a) 20Hz to 20kHz
   b) 16Hz to 20kHz
   c) 15Hz to 19kHz
   d) 20Hz to 22kHz.

9. The time period of a simple pendulum will be doubled when.
   a) Its length becomes four times
   b) Its mass gets doubled
   c) Both mass and length are doubled
   d) Length is doubled.

10. A radio station broadcaste at 380kHz. what is the wavelength of station?
    a) 790m   b) 395m
    c) 760m   d) 197.5m

11. If a metal bob of a simple pendulum is replaced by a wooden ball of the same mass, than its time period.
    a) In creases   b) remains same
    c) decreases
    d) First in creases and then decreases.

12. A simple pendulum vibrates with a time period of 3 seconds. If the length is increased by 9 times, then period becomes :
    a) 16 s   b) 12 s
    c) 8 s   d) 9 s

13. A pendulum becomes slower after same time and finally stops because of
    a) air friction
    b) gravity of earth
    c) Mass of the pendulum
    d) all of these.

14. When a simple pendulum is made to oscillate on the surface of moon, its time period in comparison to that on earth :
    a) increases   b) decreases
    c) remains same   d) is same

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

16. When a source of sound moves towards a stationary observer, the wavelenth of sound received by the observer :
    a) increases
    b) decreases
    c) remain same
    d) cannot say

17. At a given temperature velocity of sound in oxygen and in hydrogen has the ratio:
    a) 4 : 1
    b) 1 : 4
    c) 1 : 1
    d) 2 : 1

18. A pendulum is taken on a planet where acceleration due to gravity is four times that on the earth. Then time period of the pendulum will be :
    a) 1/2 T
    b) 2 T
    c) $2\sqrt{2}$ T
    d) 4 T

19. A simple pendulum has maximum potential energy:
    a) at the extreme positions
    b) at the mean position
    c) in between the mean position and extreme position
    d) none of these

20. Water waves are :
    a) longitudinal
    b) transverse
    c) both longitudinal and transverse wave
    d) neither longitudinal nor transverse

21. The force that brings the body back to its mean position is called :
    a) gravitational force
    b) buoyant force
    c) restoring force
    d) deforming force

22. Sound travels fastest in which of the following media :
    a) metal
    b) water
    c) gas
    d) all of these

23. Sound waves are :
    a) transverse waves
    b) longitudinal waves
    c) electromagnetic waves
    d) none of these

24. The velocity of sound waves in vaccum is :
    a) 1500 m/s
    b) 3×10^8 m/s
    c) 330m/s
    d) Zero

25. Audible range of sound is :
    a) 120 Hz - 120000 Hz
    b) 20 Hz - 20000 Hz
    c) 30 Hz - 30000Hz
    d) 50Hz - 50000 HZ

26. Infrasonics are waves having frequency :
    a) <20Hz
    b) >20 Hz
    c) <20 KHz
    d) >20 KHz

27. Ultrasonics are waves having frequency :
    a) >20Hz
    b) <20 Hz
    c) <20 KHz
    d) >20KHz

28. Out of the following, which frequency is not audible to human ear :
    a) 50Hz
    b) 500 Hz
    c) 5000 Hz
    d) 50,000 Hz

29. If the distance between two consecutive crests is A,then its wavelength is :
    a) A/2
    b) A
    c) 2A
    d) 3A

30. If a wave completes 100 vibrations in 25 sec, then its frequency is :
    a) 4 Hz
    b) 25 Hz
    c) 20 Hz
    d) 200 Hz

31. When a vibrating tuning fork is touched to a table, it produces loud sound because of
    a) free vibrations
    b) forced vibrations
    c) resonance
    d) none of these.

32. The relationship between wave velocity (v) frequency (*v*) & wavelength (λ) is given by:
    a) $v = \dfrac{n}{\lambda}$
    b) $v = \dfrac{\lambda}{n}$
    c) $n = v\lambda$
    d) $v = n\lambda$

33. Frequency (v) and time period (T) are related to each other as :

    a) $v = T$
    b) $\dfrac{v}{T} = 1$
    c) $vT = 1$
    d) $v = T^2$

34. 1 Bel = _____ decibels.
    a) 1
    b) 10
    c) 100
    d) 1000

35. The waves that propagate in metals are :
    a) longitudinal
    b) transverse
    c) both longitudinal and transverse
    d) none of these .

36 If time period of a body is 0.1 sec, then its frequency is
    a) 1Hz
    b) 100 Hz
    c) 10 Hz
    d) 1000 Hz

37 The sound waves are :
    a) longitudinal
    b) transverse
    c) both longitudinal as well as transverse
    d) electromagnetic waves

38. The persistence of hearing in a normal human being is
    a) 10sec
    b) 0.1sec
    c) 1 sec
    d) .2sec

39. The vibrations whose amplitude of vibration remains same are called
    a) free vibration
    b) forced vibration
    c) damped vibrations
    d) resonant vibrations.

40. A transverse wave has a wavelength of 20m and frequency of 100Hz. The velocity of the wave is :
    a) 200 m/s
    b) 20 m/s
    c) 2000 m/s
    d) 0.05 m/s

41. Out of the following, the waves that can pass through vaccum are :
    a) Sound waves
    b) electromagnetic waves
    c) elastic waves
    d) mechanical waves.

42. Time period of second pendilum is
    a) 3 sec
    b) 1 sec
    c) 4 sec
    d) 2 sec

43. Distance between a compression and a consecutive rarefaction is

    a) $\dfrac{\lambda}{2}$
    b) λ
    c) 2λ
    d) 4λ

44. Second's pendulum has a frequency :
    a) 4 Hz
    b) 2 Hz
    c) 1 Hz
    d) 0.5 Hz

45. Minimum distance to hear echo is :
    a) 0.17 m
    b) 1.7 m
    c) 17 m
    d) 170 m

46. SONAR is based on the principle of
    a) reverberation
    b) echo
    c) resonance
    d) vibration

47. A man standing 100m from a wall hears an echo of the sound of his own clapping after 0.2 sec. then speed of sound is
    a) 330 m/s
    b) 200 m/s
    c) 500 m/s
    d) 340 m/s

48. What is transmitted in a sound wave
    a) energy
    b) momentum
    c) particles
    d) none of these

49. Find wavelength of a wave generated by a tuning fork of frequency 340 Hz
    (Take velocity of sound = 340 m/s)
    a) 2.0 m
    b) 1.56 m
    c) 1.00 m
    d) 0.06 m

50. The vibrations whose amplitude of oscillation decreases with time are called :
    a) free vibration
    b) damped vibration
    c) resonantvibration
    d) forced vibration

51. A tuning fork is made of :
    a) steel   b) iron
    c) invar   d) elinar

52. The velocity of sound waves in air is :
    a) 1500 m/s   b) 3×10^8 m/s
    c) 330m/s   d) Zero

53. Human ear can hear those mechanical waves whose frequency lies in the frequency range :
    a) less than 1000 Hz but greater than 10000 Hz
    b) between 1000Hz and 5000Hz
    c) between 500Hz and 20000Hz
    d) all of the above

54. when a wave is reflected from a denser medium the change in phase is
    a) 0   b) π
    c) 2π d) 3π

55. In Q. No. 55, the wavelength of the wave is:
    a) 0.5 m   b) 0.3 m
    c) 3 m   d) 2 m

56. In the fig. in Q.No. 55, the time period of vibration is
    a) .5s   b) 2 s
    c) .4s   d) 1 s

57. In Q. No. 55, frequency of vibration is
    a) 1 Hz   b) 0.5 Hz
    c) 0.2 Hz   d) 3 Hz

58. The velocity of waves in Q.55, is :
    a) 0.5 ms^{-1} b) 1ms^{-1}
    c) 2 ms^{-1} d) 0.2 ms^{-1}

59. Sound travels faster in :
    a) gas   b) liquid
    c) solid   d) vacuum

60. The speed of electromagnetic wave in air is:
    a) 330 m/s   b) 3×10^5 m/s
    c) 3×10^8 m/s   d) 3×10^{10} m/s

Answers

1 c	2 b	3 a	4 a	5 b	6 a	7 b	8 a
9 a	10 a	11 b	12 d	13 a	14 a	15 a	16 c
17 b	18 a	19 a	20 c	21 c	22 a	23 b	24 d
25 b	26 a	27 d	28 d	29 b	30 a	31 c	32 d
33 c	34 b	35 c	36 c	37 a	38 b	39 a	40 c
41 b	42 d	43 b	44 d	45 c	46 b	47 c	48 a
49 c	50 b	51 d	52 c	53 d	54 b	55 d	56 d
57 a	58 c	59c	60 c				

CHAPTER - 14
REFLECTION OF LIGHT

Multiple choice Questions

1. In search lights and head lights of automobiles, the ... mirror is used :
   a) Concave mirror
   b) Plane mirror
   c) Convex mirror
   d) None of these

2. Mirror used in movie projectors is :
   a) Convex mirror
   b) Concave mirror
   c) Plane mirror
   d) None of these

3. Refractive indices of four substances A,B,C and D are 2.4, 1.3, 3.1, 2.6 respectively. Decreasing order of their optical density is :
   a) C,D,A,B
   b) B,A,D,C
   c) B,C,A,D
   d) D,A,C,B

4. Number of images that are observable of an object placed between two plane parallel mirrors is :
   a) 2
   b) 4
   c) 9
   d) Infinite

5. A convex mirror used to form an images of real object. Then tick the wrong statement :
   a) the image lies between the pole & focus
   b) the image is diminished in size
   c) the image is erect
   d) the image is real.

6. A virtual image larger than the object is produced by :
   a) Convex mirror
   b) concave mirror
   c) plane mirror
   d) concave lens

7. A ray is incident at angle of 30° with the plane mirror. Then angle between normal and reflected ray is :
   a) 45°
   b) 60°
   c) 30°
   d) 90°

8. A mirror has a focal length of +20 cm. Then the mirror is :
   a) convex mirror
   b) concave mirror
   c) plane mirror
   d) none of these

9. The magnification of a mirror, when image formed is virtual and erect is :
   a) positive
   b) negative
   c) unity
   d) infinite

10. The magnification of a mirror, when image formed is real and inverted is :
    a) positive
    b) negative
    c) zero
    d) infinite

11. Mirror formula that connects focal length(f), object distance(U) and image distance(V) is:
    a) $\dfrac{1}{f} = U + \dfrac{1}{V}$
    b) $\dfrac{1}{f} = V + \dfrac{1}{U}$
    c) $\dfrac{1}{f} = \dfrac{-1}{U} + \dfrac{1}{V}$
    d) $\dfrac{1}{f} = \dfrac{1}{U} + \dfrac{1}{V}$

12. Focal length of a plane mirror is :
    a) positive
    b) negative
    c) zero
    d) infinity

13. When the object is at infinity, characteristics of the image formed by a concave mirror at the focus are :

a) virtual, inverted and diminished
b) virtual, erect and magnified
c) real, inverted and diminished
d) real, erect and magnified

14. Rear field view mirror used in vehicles is :
a) concave   b) convex
c) plane   d) none of these

15. Out of the follow, the widest field of view is of :
a) concave mirror   b) plane mirror
c) convex mirror   d) none of these

16. When a person sees himself in a plane mirror, his image is :
a) magnified   b) diminished
c) real   d) none of these

17. The frequency of incident ray is 3×10^8 Hz. The frequency after reflection. :
a) decrease   b) remain same
c) increase   d) either 'a' or 'c'

18. Mirror's mid point is called :
a) pole
b) centre of curvature
c) centre of sphere
d) none of these

19. A real image, equal in size to the object is obtained when the object is placed at the centre of curvature in front of a :
a) concave mirror   b) plane mirror
c) convex mirror   d) none of these

20. Mirror used for shaving purpose are :
a) convex   b) concave
c) plane   d) none of these

21. A ray incident at an angle 38^0 on a mirror. The angle between normal and reflected ray is :

a) 38^0 b) 52^0
c) 90^0 d) 76^0

22. The magnification of a concave mirror is :
a) always < 1
b) always > 1
c) always $= 1$
d) may be less or greater than one

23. Ratio of the size of the image to the size of the object is known as :
a) focal ratio
b) transformation ratio
c) efficiency
d) magnification

24. Magnification has the units:
a) m   b) m^2
c) m^3 d) no units

25. Laws of reflection are true for :
a) plane mirror only
b) concave mirror only
c) convex mirror only
d) all reflecting surfaces

26. A virtual image :
a) cannot be taken on the screen
b) can be taken on the screen
c) can be sometimes taken on the screen
d) can't say

27. If an object is 30 cm away from a concave mirror of focal length 15 cm, the image will be:
a) erect   b) virtual
c) diminished
d) of same size.

28. Dentist uses _____ mirror to locate the tooth cavities in a patient :
a) plane
b) convex
c) concave
d) mix of plane and concave

29. When the object is at the focus of a concave mirror, the position of the image is
    a) focus
    b) centre of curvature
    c) in between focus and pole
    d) infinity

30. Relationship between focal length(f) and radius of curvature (R) is :
    a) $f = 2R$
    b) $f = R/2$
    c) $f = R/4$
    d) $f = R$

31. Relationship that gives the correct relation for magnification (m) amongst the following is :

    a) $\dfrac{f}{f-V}$
    b) $\dfrac{Vf}{V+f}$

    c) $\dfrac{f}{V+f}$
    d) $\dfrac{Vf}{V-f}$

32. Which of the following mirror for a virtual smaller image:
    a) plane mirror
    b) concave mirror
    c) plane and concave mirror
    d) covex Mirror

33. A person stands in front of a plane mirror at a distance of 2m. Then distance of the person and his image in the mirror is :
    a) 2m
    b) 1m
    c) 3m
    d) 4m

34. Concave mirrors are used in :
    a) magic lanterns
    b) reflecting telescopes
    c) cinema projectors
    d) all of these

35. As the object is brought nearer to the pole of a mirror, the image formed by it also moves towards the pole. The type of mirror is :

    a) convex
    b) concave
    c) plane
    d) any kind of mirror

36. A concave mirror is of focal length 15cm where should the object be placed so that its image is formed 30 cm in front of the mirror?
    a) 60cm
    b) 40cm
    c) 50cm
    d) 30cm

37. A concave mirror has a radius of curvature of 30cm. What is the nature and position of the image of an object placed 40 cm from its pole?
    a) virtual, inverted 24 cm from pole
    b) real inverted 24 cm from pole
    c) real, erect 12 cm from pole
    d) virtual, erect 12 cm from pole

38. Time taken by light to cross glass slab of thickness 2mm and refractive index 1.5 is :
    a) 4×10^{-5}s
    b) 2×10^{15}s
    c) 16×10^{-11}s
    d) 8×10^{-10}s

39. If Critical angle for a material to air is 45^0 then refractive index of the material will be:
    a) 1.04
    b) 1.5
    c) 1.41
    d) 2.5

40. An object is placed 30cm in front of a convex mirror of focal length 10 cm. Find the position of the image?
    a) 30cm
    b) 10cm
    c) 15cm
    d) 7.5cm

41. A motor car is fitted with convex driving mirror of focal length 10cm. A second mottor car 2cm broad and 21.6m high is 5m away from first car. the position of second car as seen in mirror of first car is :
    a) 5.4cm
    b) 7.4cm
    c) 9.8cm
    d) 15 cm

42. An object of size 5cm is placed is front of a concave mirror at a distance of 10cm. Focal length of the mirror is 15cm. Then size of the image is :
    a) 6cm   b) 10cm
    c) 15cm   d) 22cm

43. Velocity of light in water is :
    a) 2.3×10^5 Kms^{-1}
    b) 2.5×10^5 Kms^{-1}
    c) 3×10^5 Kms^{-1}
    d) 1.3×10^5 Kms^{-1}

44. Two plane mirrors are inclined at an angle of 45°. If an object is placed symmetrically between them, then number of images that can be observed is
    a) 12   b) 7
    c) 10   d) infinite

45. A man 180 cm high stands in front of a plane mirror. His eyes are at a height of 170 cm from the floor. Then minimum length of the mirror required for him to see his full length is :
    a) 80 cm   b) 90 cm
    c) 100 cm   d) 180cm

46. Focal length of a convex mirror is :
    a) positive   b) negative
    c) zero   d) infinity

47. When a person sees himself in a convex mirror, his image is :
    a) magnified   b) diminished
    c) virtual   d) none of these

48. A ray incident at an angle 52^0 on a mirror. The angle between normal and reflected ray is :
    a) 38^0 b) 52^0
    c) 90^0 d) 76^0

49. If an object is 20 cm away from a concave mirror of focal length 10 cm, the image will be:
    a) erect   b) virtual
    c) diminished   d) of same size.

50 A plane mirror is rotated through an angle of 30^0, the relflected rays turn through an angle of
    a) 38^0 b) 52^0
    c) 60^0 d) 76^0

Answers

1 a	2 b	3 a	4 d	5d	6 b	7 b	8 a
9 a	10 b	11 d	12 d	13 c	14 b	15 c	16 d
17 b	18 a	19 a	20 b	21 a	22 d	23 d	24 d
25 d	26 a	27 d	28 c	29 d	30 b	31 d	32 d
33 a	34 d	35 a	36 d	37 b	38 a	39 c	40 c
41 c	42 c	43 a	44 b	45 d	46 b	47 c	48 b
49 d	50 c						