WORK, POWER & ENERGY

INCLUDED IN THIS SECTION

- ✓ Multiple-Choice Questions (MCQs)
- ✓ Solutions

1. **When the displacement is along the same direction of force, then the work is said to be _____**
   a) zero
   b) negative
   c) positive
   d) infinitive

2. **What amount of work is done by a centripetal force in a circular motion?**
   a) +1
   b) -1
   c) 0
   d) none of these

3. **When the displacement is along the opposite direction of the force, then the work is said to be _____**
   a) zero
   b) negative
   c) positive
   d) infinitive

4. **Whether the body descends from a certain height using stairs or a slope or a lift, the force of gravity does the same work. Is the statement true or false?**
   a) True
   b) False
   c) Maybe
   d) Not sure

5. **What is S.I unit of work?**
   a) Joule
   b) erg
   c) Newton
   d) dyne

6. **What is C.G.S unit of work?**

Website :www.newtongateacademy.com or www.newtongate.in
Phone No: 7595947870/9163220583/8017062018 Email:ssstrategies.com@gmail.com
Address: 482 Ashoke Road, P.O. Garia, Kolkata – 700084

a) Joule
b) erg
c) Newton
d) dyne

7. 1 Joule = _____erg.

a) 10^5
b) 10^6
c) 10^7
d) 10^8

8. The rate of doing work is called _____

a) Power
b) Energy
c) Velocity
d) Acceleration

9. What is the S.I unit of power?

a) Joule
b) Erg
c) Newton
d) Watt

10. The energy possessed by a body by the virtue of its motion is called _____

a) kinetic energy
b) potential energy
c) total energy
d) motion energy

11. kWh is the unit of

a) power
b) force
c) energy
d) none of these

12. Energy is _____

a) work
b) the ability to create work
c) quantification of work
d) force multiplied by displacement

13. Power is _____

a) rate of doing work
b) ability to do work
c) rate of energy creation
d) equivalent to work

14. What is the correct expression for power?

a) P = dW/dt
b) P = F * d
c) P = E
d) P = dE/dt

15. What is the correct expression for Work?

a) W = F * ds
b) W = P/t
c) W = E
d) W = E/t

16. If a person walks on horizontal road with a suitcase in his hand, the work done is?

a) 0
b) 1
c) < 1
d) none of the above

17. What is the work done by a man in carrying a suitcase weighing 30 kg over his head, when he travels a distance of 10 m in the vertical direction?

a) 2490 J
b) 3490 J
c) 2499 J
d) 3499 J

18. One horse power is equal to

a) 766 W
b) 747 W
c) 764 W
d) 746 W

19. Work done is zero when

a) force causes displacement in its own direction.
b) force causes displacement in opposite direction.
c) force causes displacement in a perpendicular direction.
d) force causes displacement at an acute angle.

20. One J is equal to

a) 4.18 cal
b) 4.18 erg
c) 0.24 cal
d) 0.24 erg

21. If a ball is thrown vertically upwards, the work done is

a) positive
b) negative
c) zero
d) none of these

22. eV is the unit of

a) force
b) work
c) power
d) energy

23. A body at maximum height possesses

a) kinetic energy
b) potential energy
c) solar energy
d) heat energy

24. In an electric cell while in use, the change in energy is from

a) electrical to mechanical
b) electrical to chemical
c) chemical to mechanical
d) chemical to electrical

25. The energy possessed by the wheels of a moving car is

a) translational kinetic energy
b) rotational kinetic energy
c) both (a) and (b)
d) neither (a) nor (b)

26. An oscillating pendulum at its extreme position possesses

a) kinetic energy
b) potential energy
c) both (a) and (b)
d) None of these

27. A ball rolls on an inclined plane. On midway through its motion, the ball has

a) only kinetic energy
b) only potential energy
c) both (a) and (b)
d) none of the above

28. When the velocity of a particle is doubled, its kinetic energy:

a) increases by two times
b) increases by four times
c) decreases by two times
d) decreases by four times

29. When you double the velocity, the kinetic energy increases by 4 times.
A ball of mass *m* is thrown vertically upwards with an initial velocity to reach a height *h*.
The correct statement is:

a) Potential energy of the ball at the ground is *mgh*.
b) Kinetic energy of the ball at the ground is *zero*.
c) Kinetic energy of the ball at the highest point is *mgh*.
d) The potential energy of the ball at the highest point is *mgh*.

30. A boy drags a load 'L' along a horizontal plane AB by applying a force F. The boy does

a) no work
b) some positive work
c) negative work
d) none of these

31. The SI unit of work is joule. It is expressed in terms of mass, length and time as

a) Kgm^2s^{-3}
b) Kgm^2s^{-2}
c) $kg^2m^2s^{-2}$
d) kgm^2s^{-2}

32. The SI unit of power is watt. It is expressed in terms of mass, length and time as:

a) Kgm^2s^{-3}
b) Kgm^2s^{-2}
c) $kg^2m^2s^{-2}$
d) **none of the above**

33. A stone resting on the roof of a building has

a) potential energy
b) gravitational energy
c) kinetic energy
d) none of these

34. A falling raindrop has:

a) only kinetic energy
b) only potential energy
c) both kinetic and potential energy
d) none of these

35. An aeroplane is flying at an altitude of 10,000m at a speed of 300 km/hr. At this height, it will have

a) only kinetic energy
b) only potential energy
c) both kinetic and potential energy
d) zero kinetic and potential energy

36. Kilocalorie is the amount of heat required to raise the temperature of:

a) 1g of water through 1°C
b) 1kg of water through 100°C
c) 1kg of water through 1°C
d) 1kg of water through 10°C

37. When a flash light is switched on, the electric energy

a) directly changes to light energy
b) first changes to light energy and then to heat energy
c) first changes to heat energy and then to light energy
d) does not change

38. A pendulum is oscillating freely. The bob will have

a) only kinetic energy
b) maximum kinetic energy at extreme position
c) maximum potential energy at its mean position
d) a constant energy which is the sum of potential and kinetic energy

39. If the power of a motor is 100 kW, at what speed can it raise a load of 50,000 N?

a) 5 ms^{-1}
b) 4 ms^{-1}
c) 3 ms^{-1}
d) 2 ms^{-1}

40. Two bodies of masses m_1 and m_2 have equal kinetic energies. What will be the ratio of their linear momentum?

a) $\frac{p_1}{p_2} - \sqrt{\frac{m_2}{m_1}}$
b) $\frac{p_2}{p_1} - \sqrt{\frac{m_1}{m_2}}$

c) $\frac{{p_1}^2}{{p_2}^2} = \sqrt{\frac{m_1}{m_2}}$

d) $\frac{p_1}{p_2} = \sqrt{\frac{m_1}{m_2}}$

41. If a man of 60 kg runs so that his Kinetic Energy is 750 J, the man should run with a velocity of _____

a) 5 m/s
b) 4 m/s
c) 6 m/s
d) 10 m/s

42. Name the unit of physical quantity obtained by the formula $\frac{2K}{v^2}$.

Here, K= Kinetic Energy, v= Linear velocity

a) Kilogram
b) Gram
c) Kilometre
d) Both (a) and (b)

43. What is the main energy transformation that occurs during Photosynthesis in green leaves?

a) Light energy to chemical energy
b) Electrical energy to chemical energy
c) Light energy to food energy
d) Light energy to heat energy

44. A ball of mass 50 g falls from a height of 2 m and rebounds from the ground to 1.6 m. Find:

i. The Potential Energy possessed by the ball when initially at rest.
ii. The Kinetic Energy of the ball before it hits the ground.

a) 1.1 J, 1.1 J
b) 1.0 J, 1.0 J
c) 1.2 J, 1.0 J
d) 1.0 J, 1.2 J

45. What is the weight of a body that is placed at the centre of the Earth?

a) Zero
b) More than zero
c) One
d) None of these

46. When a fielder takes a catch in a cricket match, what work is done?

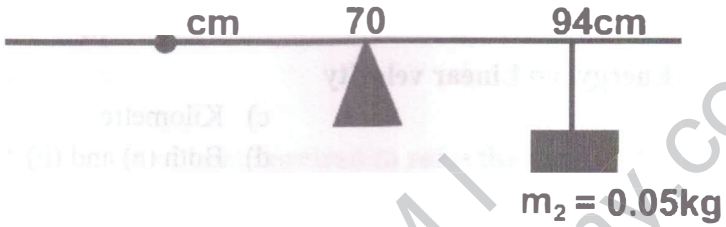
a) Positive
b) Negative
c) Zero
d) None of these

47. A body falls freely under gravity from rest. Name the kind of energy it will possess:

1. At the point from which it falls
2. While falling
3. On reaching the ground

a) 1) P.E. 2) P.E. AND K.E. 3) K.E.
b) 1) K.E. 2.) P.E. AND K.E 3) P.E.
c) 1) P.E. AND K.E. 2) P.E 3) K.E
d) 1) P.E. 2.) K.E. 3) P.E. AND K.

48. A uniform metre scale can be balanced at the 70.0 cm mark when a mass of 0.05 kg is hung from the 94.0 cm mark.



The mass of the metre scale will be

a) 6 kg
b) 0.6 kg
c) 0.06 kg
d) 0.006 kg

49. Nandan tried to push a heavy rock of 200kg for 100s but could not move it. The work done by Nandan at the end of 100s is

a) 200 J
b) 20 J
c) 2000 J
d) 0

50. A body of mass 2kg is dropped from second floor of a building which is at a height of 12 m. What is the force acting on it during its fall? (Take g = 9.8m/s^2).

a) 235.2 N
b) 24 N
c) 19.6 N
d) 117.6 N