Rise PHYSICS

1. **When a bucket is taken to the bottom of a well, the work done is**

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

2. **Which of the following forces do no work in displacing an object?**

(a) Frictional force (b) Gravitational force
(c) Electric force (d) centripetal force

3. **Work done in raising a body of weight *w* through height *h* is**

(a) *wh* (b) 0
(c) -*wh* (d) *wh* $\sin\theta$

4. **The dimensions of work are**

(a) $[MLT^{-1}]$ (b) $[MLT^{-2}]$
(c) $[ML^2T^{-1}]$ (d) $[ML^2T^{-2}]$

5. **Work is said to negative when the angle between force and displacement is**

(a) 90^o (b) 0^o
(c) 180^o (d) between 90^o and 180^o

6. **When a vehicle is moving at constant velocity and a constant engine force is used to overcome friction, the product of force times velocity is a measure of**

(a) kinetic energy of the vehicle (b) work done by the vehicle
(c) motive power of the vehicle (d) inertia of the vehicle.

7. **kWh is the unit of**

(a) power (b)energy
(c) work (d) electricity

8. **The dimensions of power are**

(a) $[ML^2T^{-1}]$ (b) $[ML^2T^{-2}]$
(c) $[ML^2T^{-3}]$ (d) $[MLT^{-2}]$

9. A lift of mass 200 kg moves upward with uniform velocity of 4 ms^{-1}. If the efficiency of the motor is 70 %, the input power of the motor is

(a) 11.2 kW (b) 16.7 kW
(c) 7.84 kW (d) 19.42 kW

10. 1 hp equals

(a) 746 J (b) 550 ft-lb
(c) 550 ft-lb s^{-1} (d) 550 W

11. The dimensions of kinetic energy are

(a) $[ML^2T^{-2}]$ (b) $[ML^{-2}T^2]$
(c) $[ML^2T^{-1}]$ (d) $[\frac{1}{2} ML^2T^{-2}]$

12. Two masses of 1 g and 4 g are moving with equal kinetic energies. The ratio of the magnitudes of their linear momenta is

(a) 4 : 1 (b) 2 : 1
(c) 1 : 2 (d) 1 : 4

13. A trolley of mass 60 kg moves on a frictionless horizontal surface and has a kinetic energy of 120 J. A mass of 20 kg is lowered vertically into the trolley. The total kinetic energy of the system is

(a) 60 J (b) 72 J
(c) 120 J (d) 144 J

14. A bomb of 9 kg explodes into two pieces of masses 3 kg and 6 kg. The velocity of 3 kg mass is 16 ms^{-1}. The kinetic energy of 6 kg mass will be

(a) 96 J (b) 192 J
(c) 384 J (d) none of these

15. The potential energy of a 50 kg person jumping from a height of 10 m is

(a) 49 J (b) 490 J
(c) 5000 J (d) 500 J

16. Which one of the followings is correct?

(a) Watt and watt-hour represent the same quantities
(b) Watt represents energy and watt-hour power
(c) Watt represents power and watt-hour energy
(d) none of these

17. The dimensions of elastic potential energy are

(a) $[ML^2T^{-2}]$ (b) $[ML^{-2}T^2]$

(c) $[ML^2T^{-1}]$ (d) $[\frac{1}{2}\ ML^2T^{-2}]$

18. If *M* be the mass of Earth, *R* its radius and *G* the gravitational constant, then the amount of work done on a body of mass *m* to escape it completely from the Earth's field is

(a) $\frac{GmM}{R}$ (b) $\frac{GmM}{2R}$

(c) $\frac{3GmM}{2R}$ (d) $\frac{2GmM}{R}$

19. If *g* be the acceleration due to gravity on Earth's surface, the gain in potential energy of an object of mass *m* raised from the surface of Earth to a height equal to the radius of the Earth is

(a) $\frac{1}{4}\ mgR$ (b) $\frac{1}{2}\ mgR$

(c) mgR (d) $2\ mgR$

20. When two electrons come close to each other, their

(a) KE change into electrical energy (b) KE change into PE

(c) electrical energy change into PE (d) none of these

21. A body is projected vertically from the surface of Earth of radius *R* with a velocity of equal to half the escape velocity. The maximum height gained by the body is

(a) $\frac{R}{4}$ (b) $\frac{R}{3}$

(c) $\frac{R}{2}$ (d) R

22. The intensity of solar energy intercepted by Earth at normal incidence daily is

(a) 1.4 kWm^{-2} (b) 14 kWm^{-2}

(c) 1.0 kWm^{-2} (d) 0.14 kWm^{-2}

23. A long spring stretched by 2 cm has potential energy *U*. When stretched by 10 cm, its potential energy will be

(a) 5 U (b) 2.5 U

(c) 25 U (d) $\frac{U}{5}$

24. The expression for the escape velocity is given by

(a) $2gR^2$ (b) $\sqrt{2gR}$

(c) $\frac{gR^2}{2}$ (d) $2gR$

25. An example of non-conservative force is

(a) electric force (b) spring force
(c) frictional force (d) magnetic force

26. Work-energy theorem can be expressed as

(a) $Fa = K_f - K_i$ (b) $\mathbf{F} \bullet \mathbf{v} = K_f^2 - K_i^2$
(c) $ma = K_f^2 - K_i^2$ (d) $Fd = K_f - K_i$

27. 1 kWh equals

(a) 0.36 MJ (b) 3.6 MJ
(c) 36 MJ (d) 360 MJ

28. If the mass and speed of a body are doubled, its kinetic energy becomes

(a) 3 times (b) 4 times
(c) 8 times (d) 16 times

29. The absolute potential energy of a body at the surface of Earth is

(a) $\frac{GmM}{R}$ (b) $\frac{GmM}{R^2}$
(c) $-\frac{GmM}{R}$ (d) $-\frac{GmM}{R^2}$

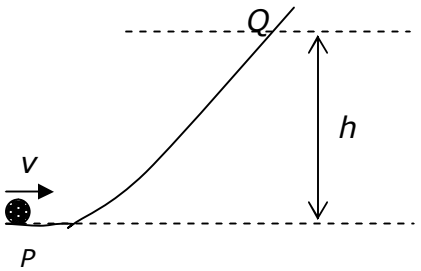
30. The absolute potential energy of a body in the gravitational field of Earth is

(a) directly proportional to the mass of the body
(b) inversely proportional to the mass of the body
(c) independent of the mass of the body
(d) none of these

31. The average and instantaneous powers become equal when work is done at

(a) any rate (b) constant rate
(c) increasing rate (d) decreasing rate

32. An object of mass *m* passes a point *P* with velocity *v* and slides up a frictionless incline to stop at point *Q*, height *h* above *P*. When a second object of mass $\frac{1}{2}m$ passes *P* with a velocity of $\frac{1}{2}v$, it will rise to



(a) $\frac{1}{4}h$ (b) $\frac{1}{2}h$

(c) $\frac{1}{\sqrt{2}}h$ (d) $\sqrt{2}\,h$

33. The dimensions of work are the same as that of

(a) torque (b) momentum

(c) force (d) power

34. The muscular power of an athlete who spends 500 J of energy to lift a load in 2 s is

(a) 125 W (b) 250 W

(c) 500 W (d) 1000 W

35. The value of escape velocity on the surface of Earth is

(a) 11.2×10^2 ms^{-1} (b) 11.2×10^3 ms^{-1}

(c) 11.2×10^4 ms^{-1} (d) 11.2×10^5 ms^{-1}

36. Tidal waves are produced due to the gravitational pull of

(a) Earth (b) Sun

(c) Moon (d) none of these

37. The source of geothermal energy is the

(a) rotation of Earth around the Sun

(b) fusion in Sun

(c) radioactive decay in Earth

(d) tidal energy

38. Energy released in the process of fission and fusion is known as

(a) geothermal energy (b) magnetic energy

(c) electrical energy (d) nuclear energy

39. Solar cells are made of a material called

(a) silicon (b) iron

(c) carbon (d) aluminum

40. The units of energy are the same as that of

(a) force (b) power

(c) work (d) torque

Key to Test Chapter 4

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