CHAPTER = 5 WORK, ENERGY AND POWER

MULTIPLE CHOICE QUESTIONS (BOOK 11)

1. Work done by the centripetal force is always:
   (a) Maximum (b) Minimum **(c) Zero** (d) None of these

2. A body of mass 5 kg is moving with a momentum of 10 kg m/s. A force of 0.2 N acts on it in the direction of motion for 10 seconds. The increase in kinetic energy is:
   (a) 2.8 J (b) 3.2 J (c) 3.8 J **(d) 4.4 J**

hint, $\Delta P = F\ t$, $P_f - P_i = F\ t$, $P_f = F\ t + P_i$, $P_f = (0.2 \times 10) + 10 = 12$

$\Delta K = \dfrac{P_f^2 - P_i^2}{2\ m}$, $increase\ in\ K.E = 4.4\ J$

3. The kinetic energy of a light and a heavy object is the same. Which object has maximum momentum?
   (a) Light object (b) Heavy object (c) Both have the same momentum (d) N.O.T

4. Two bodies of mass 1 kg and 2 kg have equal momentum. Then the ratio of their kinetic energies is:
   (a) 2:1 (b) 3:1 (c) 1 :3 (d) 1:1

5. A body fallen from height h. After it has fallen a height h/2, its will possess:
   (a) only potential energy (b) only kinetic energy
   (c) half potential half kinetic energy (d) more kinetic and less potential

6. What quantities can be calculated by multiplying force and velocity?
   (a) acceleration **(b) power** (c) torque (d) work

7. The minimum velocity given to an object so that it emerges from the gravitational field of the earth is about:
   (a) 11.2 km/s (b) 15.3 km/s (c) 5 km/s (d) 9.8 km/s

8. When one joule of work is done on a body in one second, the power of the body is said to be:
   (a) One watt (b) 0.5 watt (c) zero (d) 100 watt

9. The absolute potential energy of an object depends on:
   (a) The object's mass and height (b) The object's mass and speed
   (c) The object's shape and size (d) The object's color and temperature

10. The escape velocity of a planet depends on which of the following factors?
    (a) The mass of the planet only (b) The radius of the planet only
    (c) Both the mass and the radius of the planet (d) The density of the planet

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EXAMS PRACTICE MULTIPLE CHOICE QUESTIONS

1. Which of the following is not the unit of power?

(a) Kilo watt hour **(b)** Horse power **(c)** ft.lb/sec **(d)** Joule/sec

2. When the direction of force is opposite to the direction of displacement then the work done will be:

(a) Positive **(b) Negative** **(c)** Zero **(d)** NOTA

3. The absolute potential energy of a body of mass 'm' in the earth's gravitational field is given by:

(a) $U = -\frac{GMem}{r}$ **(b)** $U = -\frac{GMem}{r^2}$

(c) $U = \frac{GMem}{r}$ **(d)** $U = \frac{GMem}{r^2}$

4. The kinetic energy of a body of mass m is K. its momentum is

(a) $\sqrt{2mk}$ (b) 2mk (c) $\sqrt{\frac{mk}{2}}$ (d) $\frac{mk}{2}$

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5. Kilo-Watt-hour is the unit of:

(a) Force **(b)** Acceleration **(c) Energy** **(d)** Velocity

6. If $\vec{F} = 4i - 2j$ and $\vec{d} = 3i + 4j$ the work done will be:

(a) 4 joules **(b) 8 joules** **(c)** 2 joules **(d)** 12 joules

7. One horse power is equal to:

(a) 400 watt **(b)** 580 watt **(c) 746 watt** **(d)** 70 watt

8. The work done by the centripetal fore is always:

(a) Positive **(b) Zero** **(c)** Negative

9. Power is equal to:

(a) $\frac{\vec{F} \times \vec{d}}{t}$ **(b)** $\frac{\vec{F} \times \vec{P}}{t}$ **(c)** $\frac{\vec{F} \cdot \vec{d}}{t}$ **(d)** $\frac{\vec{F} \cdot \vec{P}}{t}$

10. If mass and speed both are doubled, the kinetic energy of a moving body:

(a) Increases 4 times **(b)** Increases 6 times

(c) Increases 8 times **(d)** Remains the same

11. In case of the negative work the angle between the force and the displacement is:

(a) Zero **(b)** 90° **(c) 180°** **(d)** 45°

12. The dimension of power are:

(a) $M L^2 T^2$ **(b)** $\mathbf{M L^2 T^{-3}}$ **(c)** $M L^2 T^2$ **(d)** $M^2 L^2 T^1$

13. The work done by a conservative force along a closed path is:

(a) Positive **(b)** Negative **(c) Zero** **(d)** None

14. The dimensions of the kinetic energy are:

(a) $\frac{1}{2} ML^2T^{-2}$ **(b)** $\mathbf{ML^2T^{-2}}$ **(c)** $\frac{1}{2} ML^2T^2$ **(d)** MLT^{-1}

15 A bucket of mass 10kg is moved downwards in the gravitational field through a distance of 1m. The work done in this case is equal to:

(a) 10 Joule **(b) 98 Joule** **(c)** (−98 Joule) **(d)** 0.1 Joule

16. The rate of doing work is zero when the angle between force and velocity is:

(a) 0 degree **(b)** 45 degree **(c)** 180 degree **(d)** 90 degree

17 A weight lifter consumes 500J of energy to lift a load in 2 seconds, the power used by him is:

(a) 125 watt **(b) 250 watt** **(c)** 500 watt **(d)** 1000 watt

18. If mass and speed both are doubled, the kinetic energy will be:

(a) Double **(b)** Four times **(c)** Six times **(d) Eight times**

19. One Kilo-watt-hour equals.

(a) 3.6×10^3 J (b) 3.6×10^3 cal

(c) 3.6×10^6 J (d) 3.6×10^6 cal

20 Which of the following is not a unit of power?

(a) Horse power **(b)** Joule/sec **(a)Kilo watt hour** **(a)** foot-pound/sec

21 electron volt is a unit of:

(a) Power **(b)** voltage **(a)Energy** **(a)** charge

22. The work done by the centripetal force **F** on a body moving in a circle is zero because:

(a) the body moves parallel to F (b) the body moves opposite to F

(c) the body moves at right angle to F

(d) the centripetal and centrifugal forces balance each other

23. Which of the following force is non-conservative.

(a) The force of gravitation (b) The electric force

(c) The frictional force exerted on a sliding box (d) None of these

24 When the velocity of a body of mass 'm' is doubled.

(a) Its kinetic energy is doubled (b) Its potential energy is doubled

(c) Its momentum is doubled (d) Its acceleration is doubled.

25. A 60-kg woman climbs a mountain 2000 m high in 10 h. Her average power output during the climb is

(a) 3.3 W **(b) 33 W** (c) 1960 (d) 117.6 kW

26 The derived unit for energy and work is called the Joule. It is equivalent to which combination of SI units.

(a) Kg m^2/s^2 (b) Kg m^2 (c) N/m (d) N/m^2

27. If it is true that the net force acting on a body does no work, one can conclude the body.

(a) must be moving in a similar line **(b) is moving along a circular path**

(c) is slowing down (d) is speeding up.

28. A total of 4900 J is expended in lifting a 50-kg mass. The mass is raised to a height of

(a) 10 m (b) 49 m (c) 960 m (d) 98 m

29. The kinetic energy of a body of mass 5kg and momentum is 15 N-s is

(a) 30.0 J (b) 55.0 J (c) 50.0 J **(d) 22.5 J**

30. As an object falls freely, the kinetic energy and momentum of the object.

(a) Decreases

(b) Increases

(c) Remain the same

(d) Kinetic energy increases and momentum decreases.

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