Work Done by Constant Force

21. A force of $(3 \rightleftarrows \hat{\imath} + 4\hat{\jmath})$ *Newton* acts on a body and displaces it by $(3\hat{\imath} + 4 \rightleftarrows \hat{\jmath})m$. The work done by the force is

(a) 10 *J* (b) 12 *J*

(c) 16 *J* (d) 25 *J*

22. A 50*kg* man with 20*kg* load on his head climbs up 20 steps of 0.25*m* height each. The work done in climbing is

(a) 5 *J* (b) 350 *J*

(c) 100 *J* (d) 3430 *J*

23. A force $\vec{F} = 6\hat{\imath} + 2\hat{\jmath} - 3\hat{k}$ acts on a particle and produces a displacement of $\vec{s} = 2\hat{\imath} - 3\hat{\jmath} + x\hat{k}$. If the work done is zero, the value of *x* is

(a) – 2 (b) 1/2

(c) 6 (d) 2

24. A particle moves from position $\vec{r}_1 = 3\hat{\imath} + 2\hat{\jmath} - 6\hat{k}$ to position $\vec{r}_2 = 14\hat{\imath} + 13\hat{\jmath} + 9\hat{k}$ under the action of force $4\hat{\imath} + \hat{\jmath} + 3\hat{k}N$. The work done will be

(a) 100 *J* (b) 50 *J*

(c) 200 *J* (d) 75 *J*

25. A force $(\vec{F}) = 3\hat{\imath} + c\hat{\jmath} + 2\hat{k}$ acting on a particle causes a displacement: $(\vec{s}) = -4\hat{\imath} + 2\hat{\jmath} + 3\hat{k}$ in its own direction. If the work done is $6J$, then the value of $'c'$ is

(a) 0 (b) 1

(c) 6 (d) 12

26. In an explosion a body breaks up into two pieces of unequal masses. In this

(a) Both parts will have numerically equal momentum

(b) Lighter part will have more momentum

(c) Heavier part will have more momentum

(d) Both parts will have equal kinetic energy

27. Which of the following is a unit of energy

(a) Unit (b) Watt

(c) Horse Power (d) None

28. If force and displacement of particle in direction of force are doubled. Work would be

(a) Double (b) 4 times

(c) Half (d) $\frac{1}{4}$times

29. A body of mass 5 *kg* is placed at the origin, and can move only on the x-axis. A force of 10 *N* is acting on it in a direction making an angle of 60^o with the x-axis and displaces it along the x-axis by 4 *metres*. The work done by the force is

(a) 2.5 *J* (b) 7.25 *J*

(c) 40 *J* (d) 20 *J*

30. A force $\vec{F} = (5\hat{\imath} + 4\hat{\jmath})$ *N* acts on a body and produces a displacement $\vec{S} = (6\hat{\imath} - 5\hat{\jmath} + 3\hat{k})$ *m*. The work done will be

(a) 10 *J* (b) 20 *J*

(c) 30 *J* (d) 40 *J*

31. A uniform chain of length 2*m* is kept on a table such that a length of 60*cm* hangs freely from the edge of the table. The total mass of the chain is 4*kg*. What is the work done in pulling the entire chain on the table

(a) 7.2 *J* (b) 3.6 *J*

(c) 120 *J* (d) 1200 *J*

32. A particle is acted upon by a force of constant magnitude which is always perpendicular to the velocity of the particle, the motion of the particle takes place in a plane. It follows that

(a) Its velocity is constant

(b) Its acceleration is constant

(c) Its kinetic energy is constant

(d) It moves in a straight line

33. A ball of mass *m* moves with speed *v* and strikes a wall having infinite mass and it returns with same speed then the work done by the ball on the wall is

(a) Zero (b) mv *J*

(c) *m/v.J* (d) *v/m J*

34. A force $\vec{F} = (5\hat{\imath} + 3\hat{\jmath} + 2\hat{k})N$ is applied over a particle which displaces it from its origin to the point $\vec{r} = (2\hat{\imath} - \hat{\jmath})m$. The work done on the particle in joules is

(a) – 7 (b) +7

(c) +10 (d) +13

35. The kinetic energy acquired by a body of mass *m* is travelling some distance *s*, starting from rest under the actions of a constant force, is directly proportional to

(a) m^0 (b) *m*

(c) m^2 (d) $\sqrt{m}$

36. If a force $\vec{F} = 4\hat{\imath} + 5\hat{\jmath}$ causes a displacement $\vec{s} = 3\hat{\imath} + 6\hat{k}$, work done is

(a) 4×6 unit (b) 6×3unit

(c) 5×6unit (d) 4×3 unit

37. A man starts walking from a point on the surface of earth (assumed smooth) and reaches diagonally opposite point. What is the work done by him

(a) Zero

(b) Positive

(c) Negative

(d) Nothing can be said

38. It is easier to draw up a wooden block along an inclined plane than to haul it vertically, principally because

(a) The friction is reduced

(b) The mass becomes smaller

(c) Only a part of the weight has to be overcome

(d) '*g*' becomes smaller

39. Two bodies of masses 1 *kg* and 5 *kg* are dropped gently from the top of a tower. At a point 20 *cm* from the ground, both the bodies will have the same

(a) Momentum

(b) Kinetic energy

(c) Velocity

(d) Total energy

40. Due to a force of $(6\hat{\imath} + 2\hat{\jmath})N$ the displacement of a body is $(3\hat{\imath} - \hat{\jmath})m$, then the work done is

(a) 16 *J* (b) 12 *J*

(c) 8 *J* (d) Zero

41. A ball is released from the top of a tower. The ratio of work done by force of gravity in first, second and third second of the motion of the ball is

(a) 1 : 2 : 3 (b) 1 : 4 : 9

(c) 1 : 3 : 5 (d) 1 : 5 : 3