**MASTERS PU COLLEGE, HASSAN**

**PHYSICS TOPIC: Work, Energy, Power**

1. 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*

1. 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

1. 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) 

(c) *m/v.J* (d) *v/m J*

1. A force  is applied over a particle which displaces it from its origin to the point . The work done on the particle in joules is

(a) – 7 (b) +7

(c) +10 (d) +13

1. 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)  (b) *m*

(c)  (d) 

1. If a force  causes a displacement , work done is

(a)  unit (b) unit

(c) unit (d) unit

1. 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

1. 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

1. 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

1. Due to a force of  the displacement of a body is , then the work done is

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

(c) 8 *J* (d) Zero

1. A mass of 0.5*kg* moving with a speed of 1.5 *m/s* on a horizontal smooth surface, collides with a nearly weightless spring of force constant . The maximum compression of the spring would be

(a) 0.15 *m* (b) 0.12 *m*

(c) 1.5 *m* (d) 0.5 *m*

1. A particle moves in a straight line with retardation proportional to its displacement. Its loss of kinetic energy for any displacement *x* is proportional to

(a)  (b) 

(c) *x* (d) 

1. A spring with spring constant *k* when stretched through 1 *cm*, the potential energy is *U*. If it is stretched by 4 *cm*. The potential energy will be

(a) 4*U* (b) 8*U*

(c) 16 *U* (d) 2*U*

1. A spring with spring constant *k* is extended from to. The work done will be

(a)  (b) 

(c)  (d) 

1. If a long spring is stretched by 0.02 *m*, its potential energy is *U*. If the spring is stretched by 0.1 *m*, then its potential energy will be

(a)  (b) 

(c) 5*U* (d) 25*U*

1. Natural length of a spring is 60 *cm*, and its spring constant is 4000 *N/m*. A mass of 20 *kg* is hung from it. The extension produced in the spring is, (Take )

(a) 4.9 *cm* (b) 0.49 *cm*

(c) 9.4 *cm* (d) 0.94 *cm*

1. The spring extends by *x* on loading, then energy stored by the spring is :

(if *T* is the tension in spring and *k* is spring constant)

(a)  (b) 

(c)  (d) 

1. The potential energy of a body is given by, *U* =(Where *x* is the displacement). The magnitude of force acting on the particle is

(a) Constant

(b) Proportional to *x*

(c) Proportional to 

(d) Inversely proportional to *x*

1. The potential energy between two atoms in a molecule is given by ; where *a* and *b* are positive constants and *x* is the distance between the atoms. The atom is in stable equilibrium when

(a)  (b) 

(c)  (d) 

1. Which one of the following is not a conservative force

(a) Gravitational force

(b) Electrostatic force between two charges

(c) Magnetic force between two magnetic dipoles

(d) Frictional force

1. An electric motor exerts a force of 40 *N* on a cable and pulls it by a distance of 30 *m* in one minute. The power supplied by the motor (in *Watts*) is

(a) 20 (b) 200

(c) 2 (d) 10

1. An electric motor creates a tension of 4500 *newton* in a hoisting cable and reels it in at the rate of 2 *m*/*sec*. What is the power of electric motor

(a) 15 *kW* (b) 9 *kW*

(c) 225 *W* (d) 9000 *HP*

1. A weight lifter lifts 300 *kg* from the ground to a height of 2 *meter* in 3 *second*. The average power generated by him is

(a) 5880 *watt* (b) 4410 *watt*

(c) 2205 *watt* (d) 1960 *watt*

1. Power of a water pump is 2 *kW*. If , the amount of water it can raise in one minute to a height of 10 *m* is

(a) 2000 *litre* (b) 1000 *litre*

(c) 100 *litre* (d) 1200 *litre*

1. An engine develops 10 *kW* of power. How much time will it take to lift a mass of 200 *kg* to a height of 40 *m*. 

(a) 4 *sec* (b) 5 *sec*

(c) 8 *sec* (d) 10 *sec*

1. A car of mass ‘*m*’ is driven with acceleration ‘*a*’ along a straight level road against a constant external resistive force ‘*R*’. When the velocity of the car is ‘*V*’, the rate at which the engine of the car is doing work will be

(a) *RV* (b) *maV*

(c)  (d) 

1. The average power required to lift a 100 *kg* mass through a height of 50 *metres* in approximately 50 *seconds* would be

(a) 50 *J*/*s* (b) 5000 *J*/*s*

(c) 100 *J*/*s* (d) 980 *J*/*s*

1. From a waterfall, water is falling down at the rate of 100 *kg*/*s* on the blades of turbine. If the height of the fall is 100 *m*, then the power delivered to the turbine is approximately equal to

(a) 100 *kW* (b) 10 *kW*

(c) 1 *kW* (d) 1000 *kW*

1. The power of a pump, which can pump 200*kg* of water to a height of 200*m* in 10*sec* is 

(a) 40 *kW* (b) 80 *kW*

(c) 400 *kW* (d) 960 *kW*

1. A 10 *H*.*P*. motor pumps out water from a well of depth 20*m* and fills a water tank of volume 22380 *litres* at a height of 10*m* from the ground. the running time of the motor to fill the empty water tank is )

(a) 5 *minutes* (b) 10 *minutes*

(c) 15 *minutes* (d) 20 *minutes*