6. "WORK & ENERGY"

Sr.	Statements	A	B	C	D
1	The work done will be zero when the angle between the force and distance is:	45°	60°	90°	180°
2	If the direction of motion of the force is perpendicular to the direction of motion of the body, then work done will be:	maximum	minimum	zero	none
3	If the velocity of a body becomes double, then its kinetic energy will be:	remains the same	becomes double	becomes four times	becomes half
4	The work done in lifting a brick of mass 2 kg through a height of 5 m above ground will be:	2.5 J	10 J	50 J	100 J
5	The kinetic energy of a body of mass 2 kg is 25 J, its speed will be:	5 ms^{-1}	12.5 ms^{-1}	25 ms^{-1}	50 ms^{-1}
6	Which one of the following converts light energy into electrical energy?	electric bulb	electric generator	photocell	electric cell
7	When a body is lifted through a height **h**, the work done on it appears in the form of its:	kinetic energy	potential energy	elastic potential energy	geothermal energy
8	The energy stored in coal is:	heat energy	kinetic energy	chemical energy	nuclear energy
9	The energy stored in a dam is:	electric energy	potential energy	kinetic energy	thermal energy
10	In Einstein's mass-energy equation, **c** is the:	speed of sound	speed of light	speed of electron	speed of earth
11	Rate of doing work is called:	energy	torque	momentum	power
12	The unit of work in S.I. is:	newton	meter	joule	watt
13	One joule is equal to:	1 N	1 Nm	1 Nm^{-2}	$1 \text{ N}^{-2}\text{m}^{-2}$
14	One mega joule is equal to	10^3 J	10^6 J	10^9 J	10^{-3} J
15	The work done will be maximum when the angle between force and displacement is:	0°	60°	90°	180°
16	The types of mechanical energy are:	1	2	3	4
17	The S.I. unit of energy is:	N	W	J	Pa
18	Kinetic Energy of the body is equal to:	$\frac{1}{2} mv^2$	mv^2	$2 mv^2$	mgh
19	If the velocity of a body becomes three times greater, then kinetic energy will be:	six times	four times	three times	nine times
20	Energy in the stretched bow is:	kinetic energy	potential energy	elastic potential energy	gravitational P.E.
21	Formula of gravitational P.E. is:	mgp	mgh	$\frac{1}{2} mv^2$	mgh^{-1}
22	$E=mc^2$ is given by:	Einstein	Newton	Galileo	Coulomb
23	In the depth of Earth, the molten part is called:	lava	magma	mixture	plasma
24	The source to produce pollution free electricity is:	coal	oil	wind turbine	radio activity
25	The value of speed of light is:	$3\times10^8 \text{ m}^{-1}\text{s}$	$3\times10^8 \text{ ms}^{-2}$	$3\times10^{-8} \text{ ms}^{-1}$	$3\times10^{-8} \text{ ms}^{-1}$
26	Mass-energy equation is:	$E=mc^{-2}$	$E=mc^2$	$E=m^2c$	$E=m^{-2}c$
27	Joule (J) is the unit of work which is equal to:	N	kgms^{-2}	W s	N s
28	Power can be calculated by using formula:	$P = \dfrac{t}{W}$	$P = \dfrac{W}{t}$	$P = \dfrac{F}{t}$	$P = FS$
29	One horse power is equal to:	740 W	746 W	750 W	700 W
30	A car, an elephant and a cricket ball have same kinetic energies. Which of these have greater speed?	car	elephant	cricket ball	all have same speed

31	A body of weight 100 N is lifted to height 10 metres in 2 seconds. What is its potential energy?	100 J	2000 J	1000 J	500 J
32	If θ<90°, work done is said to be:	negative	positive	zero	none
33	Power is a _____ quantity:	scalar	vector	base	fixed
34	The SI unit of power is:	joule	watt	newton	erg
35	A 4kg body is thrown vertically upward from the ground with a velocity of 5 ms^{-1}. If friction is neglected, its kinetic energy just before hitting the ground is:	25 J	50 J	75 J	100 J
36	A ball is thrown upward with an initial velocity, its:	K.E increases P.E decreases	K.E decreases P.E increases	Both K.E & P.E increases	Both K.E&P.E decreases
37	K.E. and P.E. are two basic forms of:	nuclear energy	electric energy	magnetic energy	mechanical energy
38	A weight lifter of power 1960 W lifts a load of mass M from the ground to a height of 2 m in 3 s. M is:	100 kg	200 kg	300 kg	400 kg
39	According to mass-energy equation, 1 kg mass has energy:	$3×10^{16}$ J	$9×10^{16}$ J	$9×10^{8}$ J	$3×10^{8}$ J
40	1 hp = _____ W:	756	716	736	746
41	30 N force is exerted and the trolley moves a distance of 5 m in the direction of force, the work done is:	6 J	25 J	150 J	0.17 J
42	If the speed of car decreases by half, the kinetic energy change by factor:	4	2	1/2	1/4
43	If a petrol engine does 40 J of useful work for every 200 J of energy supplied to it, then its efficiency is:	80%	60%	40%	20%
44	kWh is the unit for:	energy	power	work	efficiency
45	Hira weighing 500 N takes 90 s to reach the top of a hill 18 m high. Her average muscle power is:	2500 W	100 W	32.8 W	3.24 W

"Important Short Questions"

1) Define work. Also defines its S.I. unit?
2) Under what condition, work done on the body is maximum and minimum?
3) Work done on the body either speed it up or slows it down or raises it up. Keeping in mind, tell how much work is done by centripetal force on the orbiting satellite?
4) Why only horizontal component of force acting on the body involved in expression of the work?
5) What is work done in lifting brick of mass 2 kg through a height of 5 m above the ground?
6) If a bucket full of water having mass of 20 kg is carried by a person through distance of 10 m, calculate the work done by the person in carrying the bucket.
7) When does a force do work?
8) Give an example negative work by a body?
9) Describe the situation in which no work is done, although force is acting on the body and it is covering some displacement.
10) Why do we need energy?
11) Define energy. Give two types of mechanical energy.
12) The kinetic energy of a body of mass 2 kg is 25 J. Find its speed?
13) A car has kinetic energy 'K'. What will be effect on its kinetic energy if its velocity is doubled?
14) Which would have a greater effect on the kinetic energy of an object, doubling the mass or doubling the velocity?
15) If the speed of a particle triples, by what factor does its kinetic energy increases?
16) Two bullets are fired at the same time with the same kinetic energy. If one bullet has twice the mass of the other which has the greater speed and by what factor? Which can do the most work?
17) Why is potential energy stored in the body when it is lifted to some height from surface of earth?
18) Why do roads lead to the top of a mountain wind back and forth?

19) Define elastic potential energy.
20) A bullet is fired from the gun, bullet penetrates into a sand wall and it stops. Where is kinetic energy used?
21) A meteor enters into earth's atmosphere and burns. What happens to its kinetic energy?
22) What is light energy? Write its importance.
23) What is meant by chemical energy? Write its sources.
24) What is nuclear energy? How is it obtained?
25) Why fossil fuels are called non-renewable form of energy?
26) Fossil fuels causes serious health problems. Explain.
27) Name four renewable energy sources.
28) Describe the components of solar system.
29) What are solar cells and how they are made? Write their two uses.
30) Which form of energy is most preferred and why?
31) Name the five devices that convert electrical energy into mechanical energy?
32) Write the importance of wind energy.
33) What is meant by magma and geothermal energy?
34) What is meant by biomass? How can electricity be generated by it?
35) What is meant by mass-energy equation?
36) What is meant by efficiency of a system?
37) An energy saver bulb has efficiency of 80%. What does it mean?
38) What is meant by the term power? Define watt.
39) The motor of a crane uses power P to lift a steel beam. By what factor must the motor's power increase to lift the beam twice as high in half the time.

"Important Long Questions"

(**Note:** This chapter is more important with respect to numerical problems, so focus more on them)

1) Define Kinetic Energy. Derive its relation.
2) Define potential energy. Derive its relation.
3) State law of conservation of energy. Discuss that processes in nature are results of energy changes.
4) Explain any four non-conventional energy sources.