INDIAN SCHOOL MUSCAT
SENIOR SECTION
DEPARTMENT OF PHYSICS
CLASS IX (2016-17)
WORK AND ENERGY

WORKSHEET-4

SECTION-A

CONCEPTUAL QUESTIONS

1	Name the physical quantity having the unit of Newton-metre	1
2	Under what condition the work done by a force is zero	1
3	Give the relation between momentum and kinetic energy of a body.	1
4	Give two examples for work done by a force to be negative.	1
5	When an arrow is shot from its bow, it has kinetic energy. From where does it get this kinetic energy?	1
6	Can an object have mechanical energy even if its momentum is zero. Also can an object have momentum without energy. Explain.	2
7	What is Power? Show that power = Force × velocity	2
8	State the commercial unit of energy and express it in joule.	2
9	Explain the energy changes taking place in a simple pendulum	2
10	Why no work is being done for planetary motion?	2
11	Two bodies of different masses m1 and m2 ($m_1 > m_2$) are moving with same kinetic energy. Which one does greater work? If they are stopped by applying brakes which body will stop first and why?	2(SA2)
12	(a) A truck and car are moving with same velocity. Which of the two would have less kinetic energy? (b) Give an example of electrical energy converted into light energy. (c) An electric bulb is rated 15 Watts. Explain the statement.	3 **SA2(2012)**
13	Name the energy possessed by the following: (a) Flying aeroplane (b) Water stored in the dam (c) Stretched spring (d) Blades of a working mixer	3

14	Explain the energy conversion taking place in the following
	    (a) Nuclear explosion
	    (b) Photosynthesis
	    (c) During lightning
		3

15	State and prove the law of conservation of energy?	3

SECTION-B

NUMERICAL PROBLEMS

16	A boy and a girl are running with the same speed. If the mass of the boy is 20 times that of the girl, find the ratio of their kinetic energy?	1
17	An electric motor has an output power of 2400 W and is used to raise a ship's anchor. If the tension in the cable is 8 kN, at what constant speed is the anchor being raised ?	1
18	Water is falling on the blades of the turbine at a rate of 6×10^3 kg per minute at a height of 10m. Calculate the power given to the turbine.(Take g =10m/s^2)	1 **SA2** **(MARCH 2016)**
19	A body A of mass 3 kg and body B of mass 2 kg are dropped simultaneously from a height of 14.9 m. Calculate the ratio of *a)* Their momenta *b)* their kinetic energies	1
20	Two forces are acting on a body. First force of 5N from west to east and second force of 3N from east to west to displace it to a distance of 5m. What is the work done by the forces and in which direction the displacement takes place.	2
21	What do you understand by the units of electrical energy? How many joules of energy is consumed if the Watt hour meter shows 400 units of energy?	2
22	A stone is thrown vertically upwards with a velocity of 40m/s. a) At what height will its kinetic energy and potential energy be equal b) Calculate the P. E. of the body if its mass = 10Kg	2
23	A body of mass 5Kg is lifted vertically at a constant velocity of 12m. calculate a) the force applied b) work done in lifting the body c) what happens to the work performed ?	3
24	A boy having mass of 40kg runs up a flight of 50 steps, each step is 10cm high and the boy crosses each step in 5 seconds. Calculate	3

	(a) Work done (b) Power developed (given $g = 9.8ms^{-2}$)	
25	An electric kettle of power 500W and a geyser of power 2kW are used 2hours everyday. Calculate the cost of using them for 60 days if the cost is Rs.1.50 per unit?	3