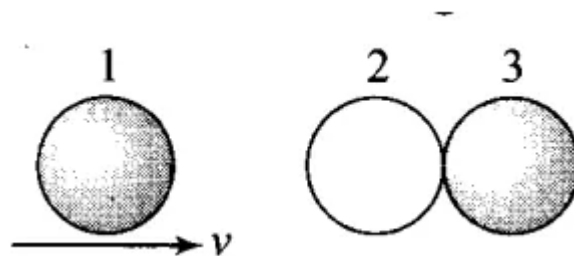


**National Institute of Open Schooling**  
**Senior Secondary**  
**Lesson 6 – Work Energy and Power**  
**Worksheet-6**

- Q1.** Suppose you are riding a bicycle along a straight horizontal road. Note down the distance travelled and mass of the bicycle. Is there any work done by the bicycle against gravity.
- a) If Yes, Calculate the work done by the bicycle against gravity
  - b) If No, Support your answer with reasons
- Q2.** Work done is defined by  $W = Fd \cos\theta$  where the angle  $\theta$  between the force and the displacement is important. In fact, it leads us to the situation in which work becomes a positive or a negative quantity.  
Hence, observe your surroundings and give examples of positive work and negative work from day to day life.
- Q3.** Continue to **Q2**, we did not consider whether the work is done in one second or in one hour. However, the time taken to perform a particular work is important, in our daily life. Why, it is important to know the rate at which work is done and how will you calculate the rate at which work is done?
- Q4.** In Physics work is defined as done by a force, whatever its magnitude, if there is displacement of the object. The capacity to do work is called energy. All objects, moving or stationary possess some kind of energy due to their motion or position in space.  
Hence, observe your surroundings and explain different types of energies possessed by moving or stationary objects.
- Q5.** Take three identical balls and arrange them as given in the figure below on frictionless surface.



Two balls bearing in contact with each other are hit head on by third ball moving initially with a speed  $v$  as shown in above figure. Consider collision is elastic, observe and write down the possible result/results after collision.

- Q6.** Observe your surroundings and explain **Law of Conservation of Energy** by having one example from day to day life.

- Q7.** Observe your surroundings; give examples of Conservative Forces and Non Conservative Forces. Differentiate Conservative Forces and Non Conservative Forces with supportive explanation.
- Q8.** It's well known phenomena that a healthy human heart beats 72 times in one minute. Assume that average work done by a healthy human heart is 0.6J while it beats once. Calculate the power used by heart in one minute.
- Q9.** Your father is driving a car of mass 2000kg. He started the car from rest; explain how much work must be done by the engine to attain the speed of  $1 \text{ km h}^{-1}$  in 2 minutes. The speed of car is  $80 \text{ km h}^{-1}$  on a highway. Suddenly father applies brakes to avoid an accident and the car comes to rest in 5 seconds. Comment on the average power of the brakes.
- Q10.** A man fires a bullet of mass 1kg on a target and bullet gets embedded into target of Mass 50kg. Comment which type of collision is this? The velocity of bullet before collision is  $120 \text{ km/h}$ ? Calculate
- Velocity of the system after collision.
  - Kinetic energies before and after the collision?