Ans. It is the transformation of our muscular energy into mechanical energy to ride the bicycle.

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8. Does the transfer of energy take place when you push a huge rock with all you might and fail to move it? Where is the energy you spend going?

Ans. While we push a huge rock with all our might(power) but fail to move it no energy transfer occurs as cellular energy simply wastes out in muscle contraction and relaxation even heat generation(sweating).

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9. A certain household has consumed 250 units of energy during a month. How much energy is this in joules?

Ans. Energy consumed by a certain household = 250 kWh

since 1 kWh $= 3.6\times10^{6}J$

therefore 250 kWh $= 250\times3.6\times10^{6} = 9\times10^{8}J$

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10. An object of mass 40 kg is raised to a height of 5 m above the ground. What is its potential energy? If the object is allowed to fall, find its kinetic energy when it is half way down.

Ans. Potential energy $(P) = m\times g\times h = 40\times5\times10$ = 2000 J

When the object is half way down the height of the object is = 2.5 m

initial velocity (u) = 0 (thrown from ground/rest)

since $v^2 = u^2 + 2gh$

= 0 + 2 x 10 x 2.5

= 50

Kinetic energy $= \frac{1}{2}\times m\times v^2$

$= \frac{1}{2}\times40\times50$ = 1000 J