Grade 8 Integrated Science Topical Questions and Answers on Force and Energy

1. What is kinetic energy?

- Kinetic energy is the energy that an object possesses due to its motion. It is calculated using the formula $KE = 1/2\ mv^2$, where m is mass and v is velocity.

2. Define potential energy and give an example.

- Potential energy is the energy stored in an object because of its position or state. A classic example is a book on a shelf, which has gravitational potential energy due to its height above the ground.

3. How does a solar panel work in terms of energy transformation?

- A solar panel transforms solar energy into electrical energy. This process is known as the photovoltaic effect, where photons from sunlight excite electrons in the panel, creating an electric current.

4. Explain the principle of conservation of energy with a real-life example.

- The principle of conservation of energy states that energy cannot be created or destroyed, only transformed from one form to another. For example, when you ride a bicycle downhill, your potential energy is converted into kinetic energy.

5. What are non-renewable energy sources? Provide two examples.

- Non-renewable energy sources are those that do not replenish within a human lifetime. Examples include coal and petroleum.

6. Describe how pressure is calculated and give an example involving liquids.

- Pressure is calculated as the force applied per unit area. In liquids, pressure at a point is given by $P = pgh$, where p is the density of the liquid, g is acceleration due to gravity, and h is the depth of the liquid. An example is the pressure at the bottom of a swimming pool.

7. What is the role of a dynamo in energy transformation?

- A dynamo transforms mechanical energy (from turning the dynamo) into electrical energy, which can then be used to power devices or charge batteries.