Physics (New Book) - 9th Class Physics Chapter 6 Long Question Preparation

Q1. Define work. when a force do work? explain

Ans 1: Work: work is said to be done when a force acts on a body and moves it in the direction of the force.
Recognition of work: the question raised how much work is done? naturally, greater is the force acting on a body longer is the distance moved by it, larger would be work done
" work is done when a force acting on a body displaces it in the direction of force".

Ans 2: Quantity: work is scaler quantity

Ans 3: Dependence; it depends on the force acting on the body, displacement of the body and angle between them.

Ans 4: unit: its unit is joule(J)

Ans 5: Definition: if one newton force act on the body it covers one meter distance in the direction of force, then its work will be one joule
1J= 1N*1m

Q2. Q no:5(A) Define potential energy. Give its examples and derive its equation P.E = mgh.

Ans 1: Potential Eenergy :
The energy possessed by a body due to its position is known as its potential energy.
Explanation:
Stored water possesses potential energy due to its height . A hammer rasisedup to some height has the avilityto do word because it possesses potential energy. Astretchedbow has potential energy due itsStretched position. When released , the stored energy of the bow is called elastic potential energy
The potential energy possessed by a hammer is due to its height. The energy present in a body due to its height is called gravitational potential energy.
Derivation
Let a body of mass m be raised up through height h from the ground. The body will acquire potential energy equal to the work done in lifting it to height h.
Thus
potential energy P.E = F x h
=w xh
= mg x h
P.E = mgh

Q3. How is energy converted from one form to another? Give some examples

Ans 1: Interconversion of energy: the conversion of one form of energy into another form is called interconversion of energy.
Explanation: energy cannot be destroyed however it can be converted into some other forms . For example, rub your hands together quickly. You will feel them warm. You have used your muscular energy in rubbing hands as a result heat is produced. In the process of rubbing mechanical energy is converted into heat energy. Processes in nature are the results of energy changes. For examples, some of the heat from the sun is taken up by water in the oceans. This increases thermal energy. Thermal energy causes water to evaporate from the surface to form water vapors. These vapors rise up and form clouds. As they cool down, they form water drops and fall down as rain. Potential energy changes to kinetic energy as the rain falls . This rain water may reach a lake or a dam. As the rain water flows down, its kinetic energy changes into thermal energy while parts of kinetic energy of flowing water is used to wash

away soil particles of rocks known as soil erosion. During the interconversion of energy from one form to other forms, the total energy at any time remains constant .

Q4. Write a note on energy a nd environment

Ans 1: Sources; environmental problems such as pollution that consist of noise , air pollution and water pollution may arise by using different sources of energy such as:

- Fossil fuels
- Nuclear energy

Ans 2: Pollution: polliton is the change in quality of environment that can be harmful and unpleasent for living things.
Thermal pollution: a temperature rise into the environment that disturbs life is called thermal pollution.
Effects:

- Thermal pollution upsets the balance of life.
- It endangers the survival of many species

Ans 3: Air pollutants: Air pollutants are unwanted and harmful. Natural processes such as volcanic eruptions, forest fires and dust storm add pollutant to the air. These pollutants rarely build up to harmful levels. On the other hand the burning fuel and solid wastes in homes, automobiles' and factories release harmful amount of air pollutants

Ans 4: Pollution from fission plans: al power plants produce waste heat, but fission plants produce the most. The heat released into a lake , a river , or an oven upsets the balance of life in them. Unlike other power plants , nuclear power plants don't produce carbon dioxide. But they do produce dangerous radioactive wastes.

Ans 5: Laws; in many countries government have passed laws to control air pollution. Some of these limit the amount of pollution that power plants , factories ad automobiles are allowed to give off. To meet this condition for automobiles , new cars have catalytic converts. These devices convert some polluting gases. The use of lead free petrol has greatly reduced the amount of lead in the air. Engineers are working to improve new kinds of car engines that use electricity or energy sources other than diesel and petrol. Many individual communities have laws which protect their areas from pollution. Individuals can help to control arir pollution simply y reducing the use of card and other machines that burn fuel. Sharing rides and using public transportation ar the way to reduce the number of automobile's in use.

Q5. What are fossil fuels? explain

Ans 1: Fossil fuels: natural fuel such as coal, oil and gas are called fossil fuels because they are produced by dead bodies of lining things.
Uses; we use fossil fuels such as coal, gas to heat our houses and run industry. They are usually hydrocarbons.

Ans 2: Hydrocarbons: hydrocarbons means compound of carbon and hydrogen. When they burnt they combine with oxygen from the air.

Ans 3: Non renewable sources: fossil fuels took million of years for their formation they are known as non renewable resources. We are using fossil fuels at very fast ratee. Their use is increasing day by day . If we continue to use them. They will soon exhausted. Once their supply is exhausted world would face serious problems. Therefore, we should use them wisely at same time develop new sources for future survival

Ans 4: Harmful waste : moreover fossil fuels release harmful waste as carbon monoxide and other harmful gases which pollute environment

Ans 5: Diseases: This may cause serious health problems such as headache, tension, nausea, allergy, irritation of eyes, nose , throat and may cause lungs cancer, asthma, heart diseases, damage of brain, nerves and other organs of our body.

Q6. Define energy and explain kinetic energy

Ans 1: Energy: the capability of doing work is called energy. A body is capable to do work only when it has energy.

Ans 2: Kinetic energy: the energy of a body due to its motion is called its kinetic energy. This type of energy is possessed by flowing water and fired bullet.
Explanation: the general formula for the calculation of kinetic energy is derived by considering the special case. Consider a ball moving on the ground. If the initial velocity of ball is denoted by vi and its mass m, while moving the ball experiences deceleration(negative acceleration) due to frictional force(-F), roughness of ground and air drag. Ultimately this ball stops, after covering certain distance (S).

Q7. What is energy converter ?

Ans 1: Energy converter : an energy converter is a device in which a part of energy taken by the system is converted into useful work. Remaining energy is dissipated as heat energy, sound energy, noise into the environment

Ans 2: Important energy converters: here are some most important energy converters

1. Electric lamp
2. Energy saver lamp
3. Vehicle running with constant speed on a level road
4. power station

Q8. Q no:7 (B) Define Kinetic energy. Derive its formula K.E =1/2 mv^2

Ans 1: Kinetic Energy :
The energy possessed by a body due to its motion is called kinetic energy.
Derivation:
Let a body of mass m is moving with velocity V. An opposing force F actingthrough a distance S brings it to rest. The body possesses kinetic energy and is capable to do work against opposing force F until all of its kinetic energy used up.
K.E of the body = Work done by it due to motion
K.E - FS
Vi = V
Vf =0
F = ma
a =-f/m
Since motion is opposed, hence , a is negative. Using 3rd equation of motion
$2as = Vf^2 - Vi^2$
$2 (-F/m)S = 0^2 - V^2$
$FS = +1/2\ mv^2$
As we know that K.F is equal to the work done.
$K.E = 1/2\ mv^2$ (proved)

Q9. Q no: 7(A) Write is the uses of Wind Energy.?

Ans 1: Wind Energy:
Wind energy has used as a source of energy for centuries. It has powered sailing ships across the oceans . It has been used by windmills to grind grain and pump water. More recently , wind power is used to turn wind turbines. When many wind machines are grouped together on wind farms , they can generate enough power to operate a power plant. In the United stated , some wind farms generate more than 1300 MW of electricity a day. In Europe, many wind farms routinely generate hundred megawatts or more electricitya day

Q10. What is efficiency? explain working of an ideal system.

Ans 1: Efficiency: efficiency of a system is the ration of required form of energy obtained from a system as output to the total energy given to it as input.

Ans 2: Ideal system: an ideal system is that which gives an output equal to the total energy used by it. In other words, its efficiency is 100%. People have tried to design a working system that would be 100% efficient. But practically such a system does not exist. Every system meet energy losses due to friction that causes heat, noise etc. There are not the useful forms of energy and go waster . This means we cannot utilize all the energy given to working system . The energy in the required form obtained from a working system is always less than energy given to it as input.