Physics - FSC Part 1 Physics Chapter 11 Short Questions Preparation

Q1. Write two limitations of first law of thermodynamics.

Ans 1:

1. 1st law of thermodynamics does not specify the conditions under which conversion of heat into work is possible.
2. It does not specify the direction in which heat transfer takes place (high to low or low to high).
3. The fact that heat cannot be completely converted into work, is a fact that the first law cannot explain.

Q2. No spark plug is used in Diesel Engine.How it gets ignition?

Ans 1: Diesel is sprayed into the cylinder at maximum compression. Because air is at very high temperature immediately after compression, the fuel mixture ignites on contact with the air on the cylinder.

Q3. Is it possible to construct a heat engine that will not expel heat into the atmosphere?

Ans 1: No, it is not possible to construct a heat engine that will not expel heat into the atmosphere. It is against 2nd law of thermodynamics. A heat engine works only when some of the total heat absorbed from the source is expelled to a sink or atmosphere.

Q4. Does entropy of a system increase or decrease due to friction?

Ans 1: The entropy of a system increase due to the friction as work done against friction is changed into heat and heat added to the system increase its entropy.

Q5. Give an example of a process in which no heat is transferred to or from the system but the temperature of the system changes.

Ans 1: An adiabatic process is the process in which no heat is transferred to or from the system but the temperature of the system and velocities of molecules changes.
In an adiabatic expansion of a gas, the temperature decreases as the work is done in expanding the gas at the cost of its internal energy.

Q6. Write kelvin statement of the second law of thermodynamics.

Ans 1: It is impossible to devise a process which may convert heat, extracted from a single reservoir, entirely into work without leaving any change in the working system.

Q7. Define Heat Engine.

Ans 1: A device which converts heat energy into mechanical work is called heat engine.

Q8. What is difference between isothermal and adiabatic process?

Ans 1: Isothermal process: The process in which temperature of the system remains constant is called isothermal process.
T= constant
Adiabatic System: The process in which no heat enters or leaves the system is called adiabatic system.

Q9. What happens to the temperature of the room, when an air conditioner in left running on a table in the middle of a room ?

Ans 1: No change will be observed because the heat is absorbed and expelled in the same room.Hence there will be no effect on the room's temperature.

Q10. Why absolute value of internal energy cannot be measured?

Ans 1: By experiment it has been seen that the change in internal energy is independent of paths and it only depends upon change from initial to final state of the system. It is a function of state.
Internal energy is similar to the gravitational P.E.So like the potential energy, it is the change in internal energy and not its absolute value, which is important.
