1.13 COOLING LOAD

It is defined as the total heat required to be removed from the space in order to bring it to the desired temperature by air conditioning and refrigeratin equipment.

The purpose of a load estimation is to determine the size of the air conditioning and refrigeration equipment that is required to maintain inside conditions during periods of maximum outside temperatures.

The design load is based on inside and outside design conditions and it is air conditioning and refrigeration equipments to produce satisfactory inside conditions.

It is the rate at which sensible and latent heat must be removed from the space to maintain a constant space dry-bulb air temperature and humidity.

Sensible heat into the space causes its air temperature to rise while latent heat is associated with the rise of the moisture content in the space.

The building design, internal equipment, occupants, and outdoor weather conditions may affect the cooling load in a building using different heat transfer mechanisms.

The Si unit is watts.

Components of a cooling load

The two main components of a cooling load imposed on air conditioning plan operating during hot weather are as follows:

1. **Sensible heat gain**

When there is a direct addition of heat to the enclosed space, a gain in the sensible heat is to be removed during the process of summer air conditioning. The sensible heat gain may occur due to any one or all of the following sources of heat transfer

- The heat flowing into the building by conduction through exterior walls, floor, ceilings, door and windows due to the temperature difference on their two sides.
- The heat received from solar radiation. It consists of (i) heat transmitted through glass of windows, ventilators or doors and
- The heat absorbed by walls and not exposed on solar radiation and later on transferred to the room by condition.
- The heat gain from the fan work.
- The heat liberated by the occupants.

2. Latent heat gain

When there is an addition of water vapour to the air enclosed space, U gain in latent heat is said to occur. This latent heat is to be removed during the process of summer air conditioning. The latent heat gain may occur due to any one or all of the following sources.

- The heat gain due to the moisture in the outside air entering by infiltration.
- The heat gain due to condensation of moisture from occupants.
- The heat gain due to condensation of moisture from any process such as cooking foods which takes place within the conditioned space.