

## Refrigeration and Air Conditioning

- 1 Define Refrigeration. Also write down the application of refrigeration.

Refrigeration is maintaining and producing temperature below the surrounding temperature.

The refrigeration system maintain low temperature to the surrounding.

Refrigeration is process of removing heat and temperature low from an enclosed system.

Amount of heat removed by refrigeration equipment from system that is called refrigerating effect.

Refrigerating Effect Unit is kJ/s.

=> Application of Refrigeration.

- 1 Storage of food like fruits, fish, vegetables etc.
- 2 Preservation of medicine.



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3 Manufacturing ice and cooling water.

4 Liquification of gases.

5 Production of rocket fuel.

6 Computer Functioning.

7 Processing of Petroleum Product

2 Write down Properties of Refrigerant.

⇒ Properties of Refrigerant

1 It should have high latent heat for evaporation and low specific volume.

2 It should have good thermal conductivity.

3 It should have stable and not decompose any condition.

4 It should have low saturation Pressure

5 It should have high critical Pressure.

6 It should have reasonable cost.



7 It should have high COP.

8. It should have non-toxic, non-flammable.

3 Explain with neat sketch Vapour Compression System.

Vapour Compression System is completed under the 4 Processes

- 1) Compression Process
- 2) Condensation Process
- 3) Expansion Process
- 4) Vaporization Process (Evaporator)

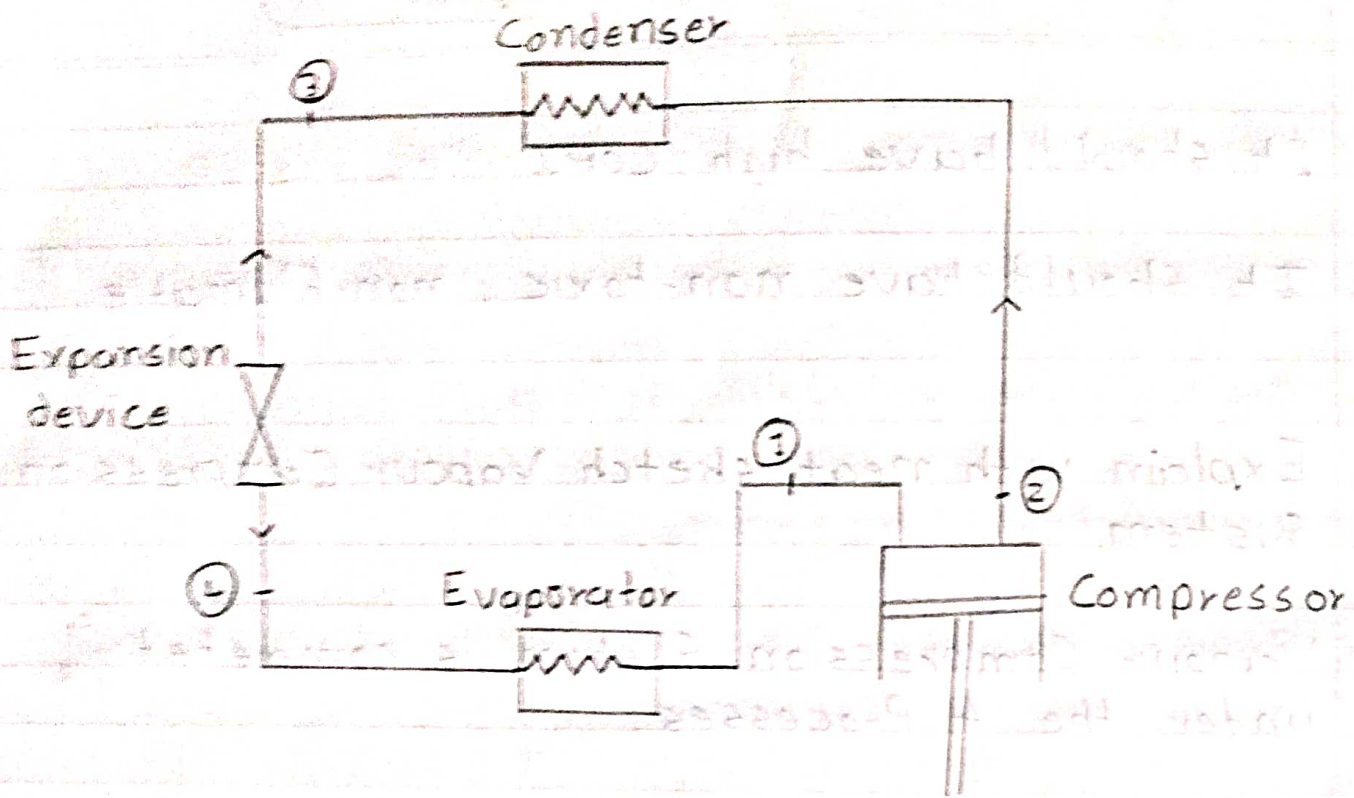
1 Compression Process :

The vapour at low temperature and low pressure enter in compressor.

Vapour compressed isentropically and its pressure and temperature are increase.

2 Condensation Process :

After leaving the compressor vapour enter into the condenser.



Vapour Compression Refrigeration System



It is condensed into high pressure and temperature liquid is collected in a receiver tank.

### 3 Expansion Process:

After leaving receiver tank it is passes through the Expansion valve

It is throttled down to low pressure and temperature.

### 4 Vaporization Process:

After leaving expansion valve it is passes through the evaporator.

In Evaporator it is vaporizes at lower pressure vapour



4 Write short note on Window Air Conditioner.

In Evaporator the low Pressure and low temperature vapour enter.

After that Compressor compress the vapour at high temperature and pressure.

After leaving Compressor vapour passing through Condenser.

In Condenser vapour condenses by heat to the cooling medium.

Liquid refrigerant passes through condenser filter, dryer and capillary tube and again throttled back to the evaporator.

Liquid refrigerant flows to evaporator where it is boils off by extracting heat from circulated air.

Fresh air is mix with circulated air to meet the ventilation requirement.

The room temperature is controlled by thermostat which is required to on-off power supply to compressor motor.