Unit 2(a)

I.C. Engine

I.C. → Internal combustion Engine

Engines → Engines are mechanical devices which convert energy into work.

E (Energy) → W (Work)

Chemical energy

↓ combustion

Heat energy → Work

Oldest engine → Steam Engine or Coal Engine } External combustion

Classification of Engine

1. No. of strokes required
   a) 2-stroke engine
   b) 4-stroke engine

2. On the basis of ignition system
   a) spark ignition Engine
   b) compression ignition Engine

3. No. & arrangement of cylinder
   a) In-line Engine
   b) V-Engine
   c) Radial Engine
   d) W-Engine

4) On the basis of fuel supply system
 a) Carburettor engine
 b) Air - injection engine
 c) Air-less injection engine

5) On the basis of fuel used
 a) Light oil engine
 b) heavy oil engine
 c) gas engine
 d) dual-fuel engine

6) On the basis of cooling system
 a) air-cooled engine
 b) water-cooled engine

7) On the basis of lubrication system
 a) Pressure Lubrication engine
 b) splash-lubrication "

8) On the basis of governing system
 a) Quality control engine
 b) Quantity control engine

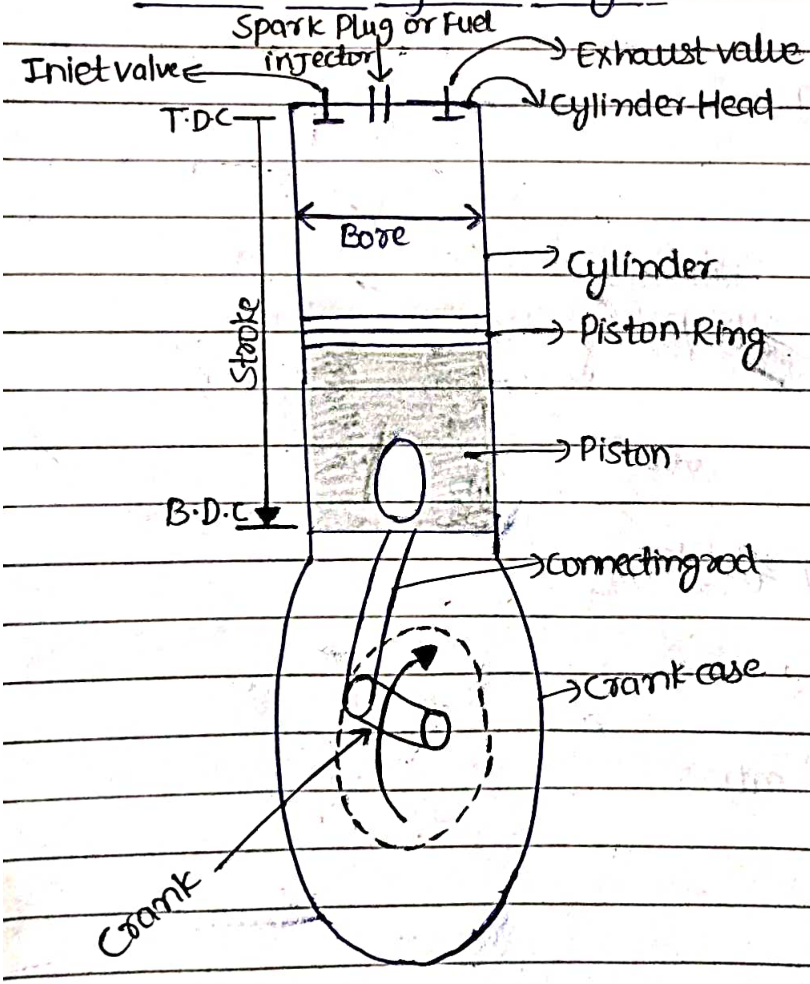
9) On the basis of valve location
 a) over-head valve engine
 b) side-valve engine

10) On the baisis of maximum engine
 a) High speed engine (rpm >900)
 b) Low speed engine (rpm <400)
 c) medium speed engine

11) on the basis of field of application.
a) Stationary engine
b) Mobile engine

12) on the basis of Length of cylinder & diameter ratio.
a) Square engine
b) column engine
c) Strut engine

* Construction of IC Engine



TDC → Top Dead centre

BDC → Bottom Dead Centre

I.C Engine

4-Stroke
- S.I — Spark ignition
- C.I — Compression Engine

2-Stroke
- S.I
- C.I

* Stroke → The distance b/w TDC & BDC is known as 1 stroke

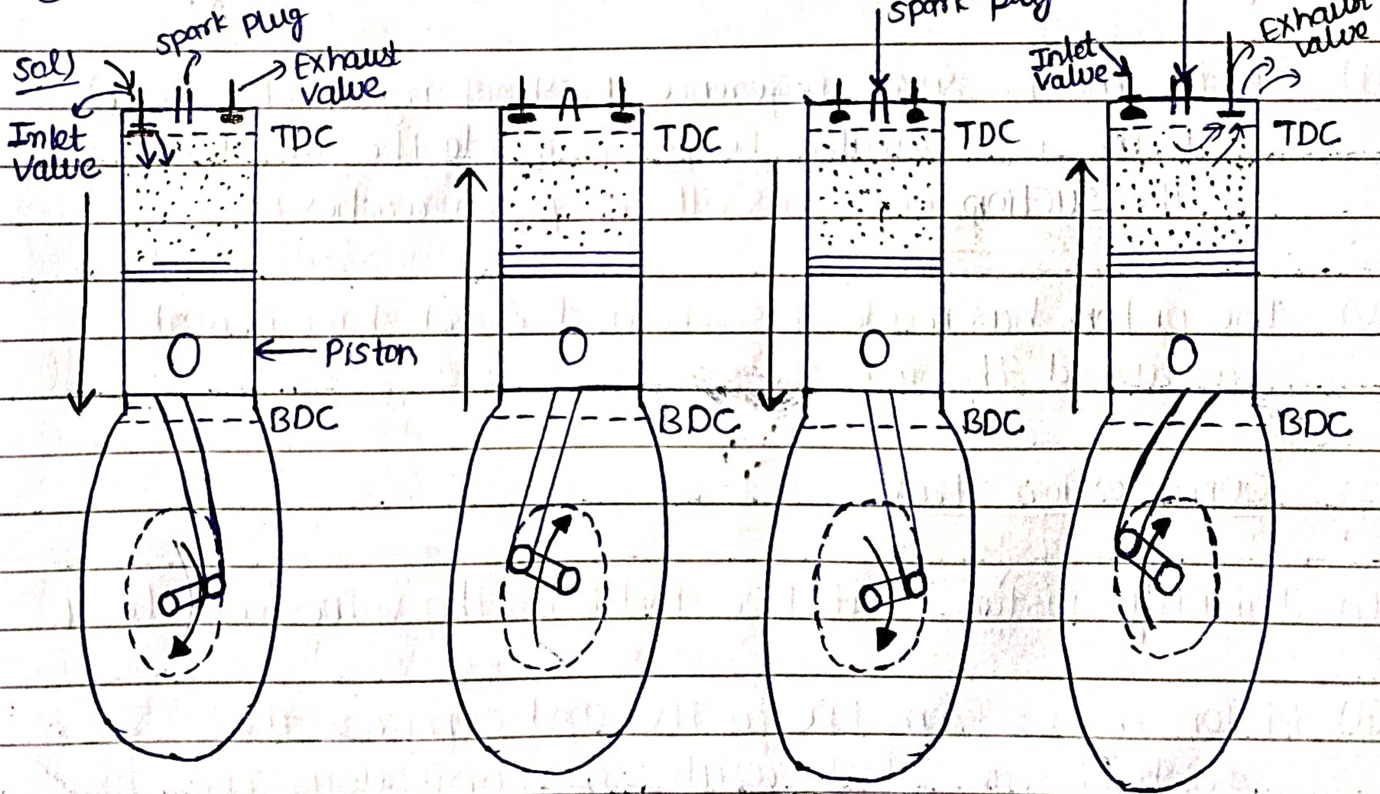
SI → spark ignition Engine
or
Petrol Engine

CI → compression ignition Engine
or
Diesel engine

Working of 4-stroke SI Engine (or petrol engine)

1. Suction (or intake)
2. Compression
3. Expansion (or power)
4. Exhaust

Sol)



a) Suction Stroke
b) Compression Structure
c) Expansion Structure
d) Exhaust Structure

1, 2, 3 5 1, 2

Workshop (S.T-1) 50 marks

Lab record → 20 marks (file)
Online Quiz → 20 marks (10 MCQ)
10 – writting work

1) Suction stroke / Intake stroke :- (0-1)

(i) Initially the piston is at TDC and inlet value is open and Exhaust value is close.

(ii) Piston moves from TDC to BDC and the pressure inside cylinder reduced to below atmospheric pressure. (vacuum)

(iii) Due to the pressure difference fresh charge (petrol + air) fills the space vacated by piston inside the cylinder. The suction continues till the piston reaches BDC.

(iv) The piston has made 1 stroke and crank shaft (crank) has turned through 180°

2) Compression stroke (1-2)

(i) Initially piston is at BDC and both the values are closed

(ii) Piston moves from BDC to TDC and compress the fresh charge which results in continuous rise in both the pressure and temperature of charge

(iii) Compression stroke continues till the piston reaches TDC. the piston has made 2 strokes now and crank has turned to 360°

~~(iv)~~ 3) Expansion or Power Stroke (3-4)

① When the piston reaches TDC, the charge is ignited by causing an electric spark due to the spark plug which is located at cylinder head, this starts the combustion of charge

② Chemical Energy of fuel is released, which rises the pressure and temp. of the gases at almost constant volume

③ Both the valves are closed, the hot gases push the piston down and work is done by the system.

④ The reciprocating motion of piston is subsequently converted into rotary motion of crank shaft

⑤ The piston has made 3 stroke and crank has turned through 540°

4) Exhaust stroke (4-0)

① Initially the piston is at BDC, the inlet valve remains close & the exhaust valve opens.

② The piston moves from BDC to T.DC and it pushes the spent out gases into the atmosphere through exhaust valve

(4) The piston has made 4-stroke & crank has turned through 720°.

The cycle completes in 4-stroke and two complete rotation of crank.

P-V diagram (~~Auto~~ Otto cycle) (make this diagram in Exam)

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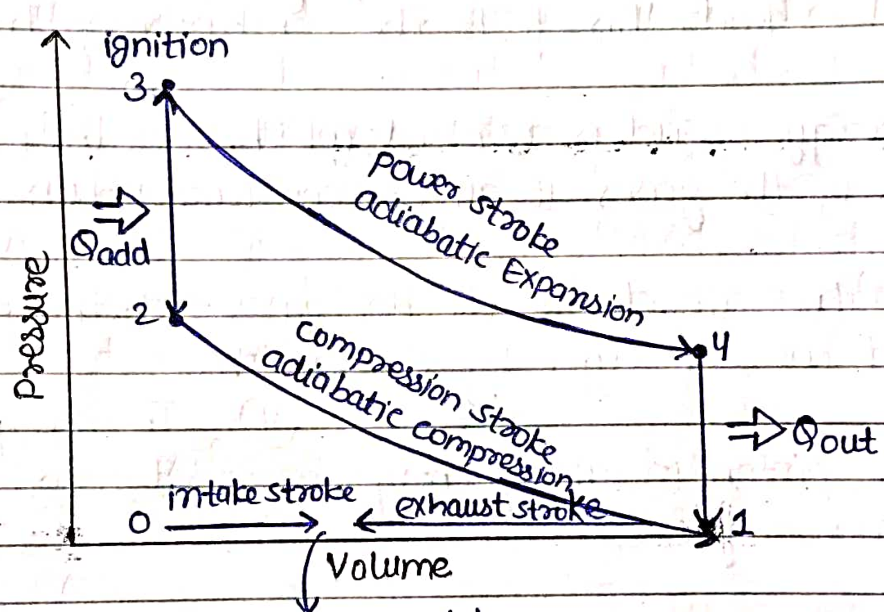


(otto cycle)

Working of 4-stroke C.I (or diesel engine)

spark plug → ~~air engine~~ fuel injector

petrol + air → air

fresh charge → air

① suction (or intake)
② compression
③ Expansion (or power)
④ Exhaust.

1) Suction stroke / Intake stroke (0-1)

(i) Initially the piston is at TDC and inlet valve is open and Exhaust valve is close.

(ii) Piston moves from TDC to BDC and the pressure inside cylinder reduced to below atmospheric pressure (vaccum)

(iii) Due to pressure difference pure air fills the space vacated by piston inside the cylinder. The suction continues till the piston reaches BDC.

(iv) The piston has made 1 stroke and crank shaft (crank) has turned through 180°

2) Compression stroke (1-2)

(i) Initially piston is at BDC and both the valves are closed.

(ii) Piston moves from BDC to TDC and compress the air which results in continuous rise in both the pressure and temperature of ~~charge~~ the air.

(iii) compression stroke continues till the piston reaches TDC. The piston has made 2 stroke now and crank has turned to 360°.

3) Expansion or Power stroke (3-4)

(i) When the piston reaches TDC, the air is ignited by causing an electric spark due to the fuel injector which is located at cylinder head, this starts the combustion of air.

(ii) Chemical Energy of fuel is released, which rises the pressure and temp. of the gases at almost constant volume

(iii) Both the valves are closed, the hot gases push the piston down and work is done by the system

(iv) The reciprocating motion of piston is subsequently converted into rotary motion of crank shaft.

(v) The piston has 3 stroke and crank has turned through 540°

4) Exhaust Stroke (4-0)

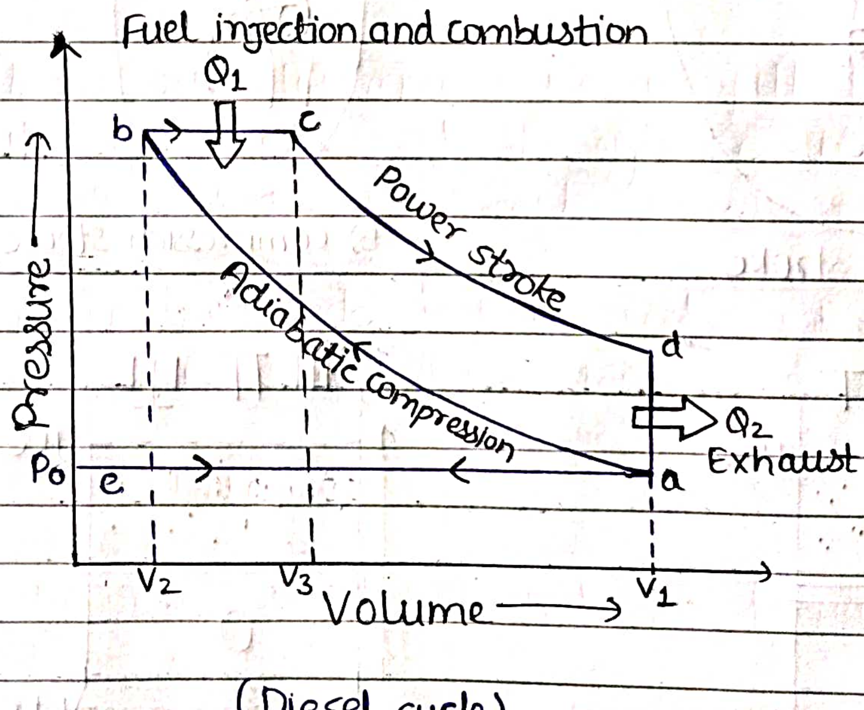
(i) Initially the piston is at BDC, the inlet valve remains close & the exhaust valve open.

(ii) The piston moves from BDC to TDC and it pushes the Spent out gases into the atmosphere through exhaust valve.

(iii) The piston has made 4-stroke & crank has turned through 720°

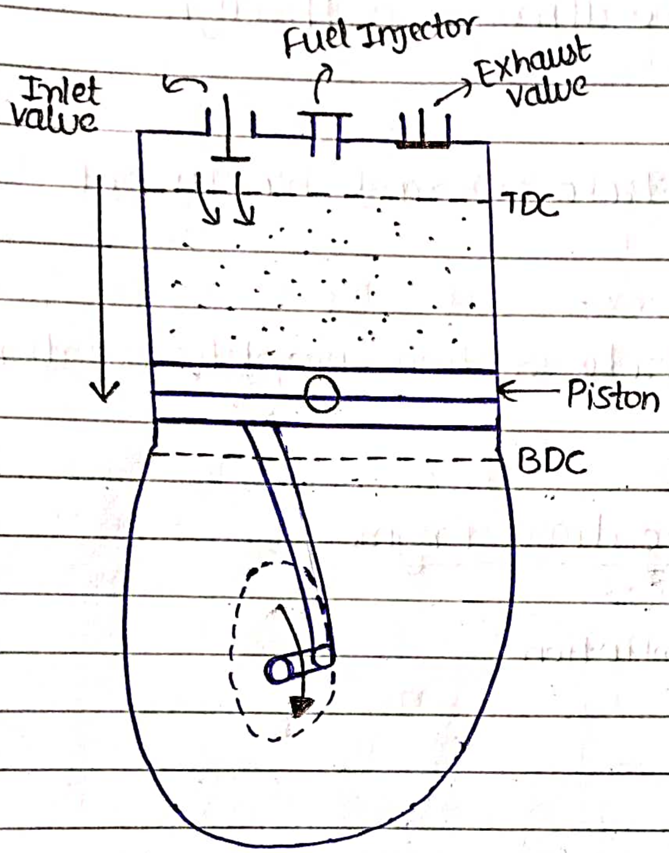
The cycle completes in 4-stroke & two complete rotation of crank.

P-V diagram of a 4-stroke diesel Engine

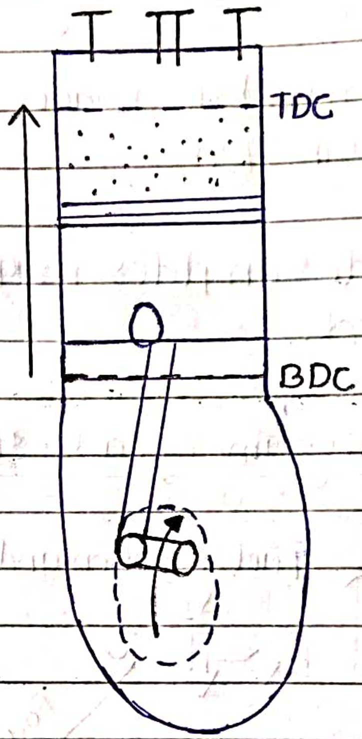


(Diesel cycle)

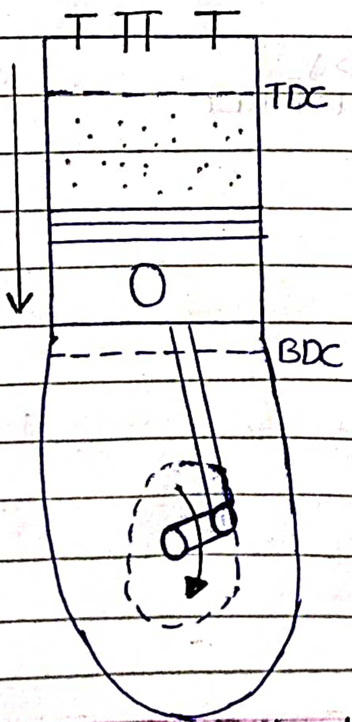
4-stroke S.I Engine



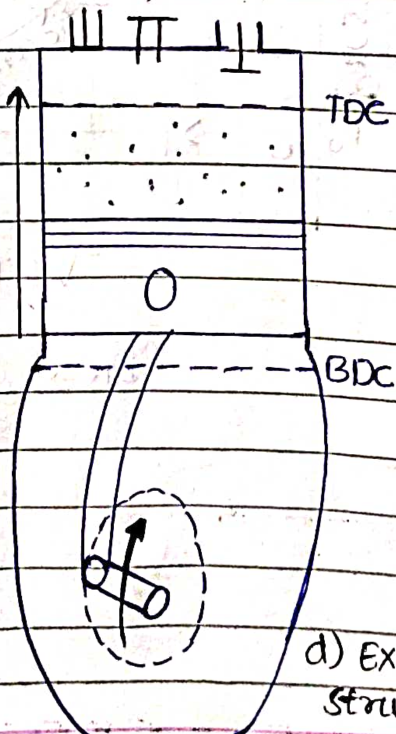
a) Suction stroke



b) Compression stroke



c) Expansion structure

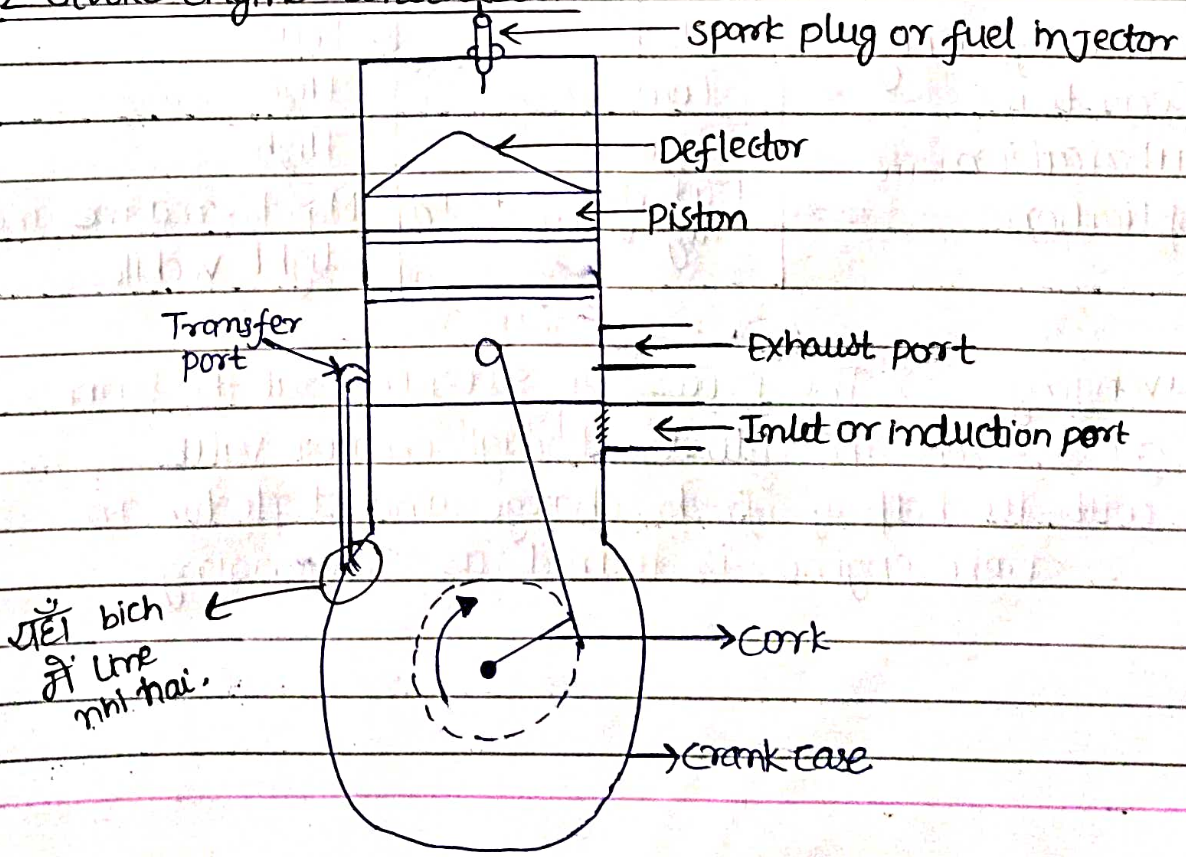


d) Exhaust structure

Difference b/w S.I (Petrol) & C.I (Diesel) Engine

Description	SI (Petrol)	CI (Diesel)
1) Basic cycle	Otto	Diesel
2) Fuel	Volatile	Non-volatile
3) Introduction of fuel	Carbureted / Injected	Injected
4) Load control	Throttle value	Fuel regulation
5) Ignition	Spark	Auto
6) r_k	6-10	16-20
7) Speed	High	Low
8) Thermal efficiency	Low (Low r_k)	High (high r_k)
9) Weight / Initial cost	Low	High

2-stroke engine construction



* Working of 2-stroke engine

① Upstroke ② Downstroke

* Diff. b/w 4-stroke & 2-stroke

	4-stroke	2-stroke
1) No. of stroke / crank revolution	4/2	2/1
2) Power developed	~~Mor~~ More	less
3) Turning moment	Less uniform	More uniform
4) Inlet & exhaust	Through values	Through ports
5) Construction	complex	Simple
6) Weight	heavy	Light
7) Size	Large	small
8) Initial cost	High	Low
9) Mechanical efficiency	less	High
10) Mixing of fresh charge and exhaust gases	No	Yes
11) Thermal efficiency	High	Low
12) Wear tear	Low	High.
13) lubrication	Low	High
14) Application	4-wheelers & heavy duty vechiles	Mopeds, marine and light vechiles.

Scavenging ⇒ The process of sweeping out the burnt gases, from the cylinder through exhaust value with the help of fresh charge and deflector in 2-stroke engine is termed as scavenging.

Working of 2-stroke petrol/S.I Engine :-

1) Upstroke :-

- Piston is at BDC inlet port is closed whereas transfer port and exhaust port are ~~form~~ open

- The exhaust gases from the previous gases are swept out from the exhaust port with the help of fresh charge and deflector. (scavenging)

- Piston moves from BDC to TDC fresh charge admits from inlet port to the crank case and further from crank case to cylinder by transfer port. This process is known as Induction.

- When piston approaches TDC and transfer port and exhaust port is covered, the compression of fresh charge takes place.

- The ~~mo~~ment piston reaches TDC, the pressure & temperature of fresh charge is maximum and spark plug provides the momentarily spark. Due to the sparking the combustion of fresh charge starts.

2) Downstroke :-

- Piston is at TDC, the exhaust port is closed whereas inlet port & transfer port are open

- Piston moves from TDC to BDC, it first uncovers the exhaust port which allows sweeping out the burnt gases

Petrol ⇒ spark plug
diesel ⇒ fuel injector.

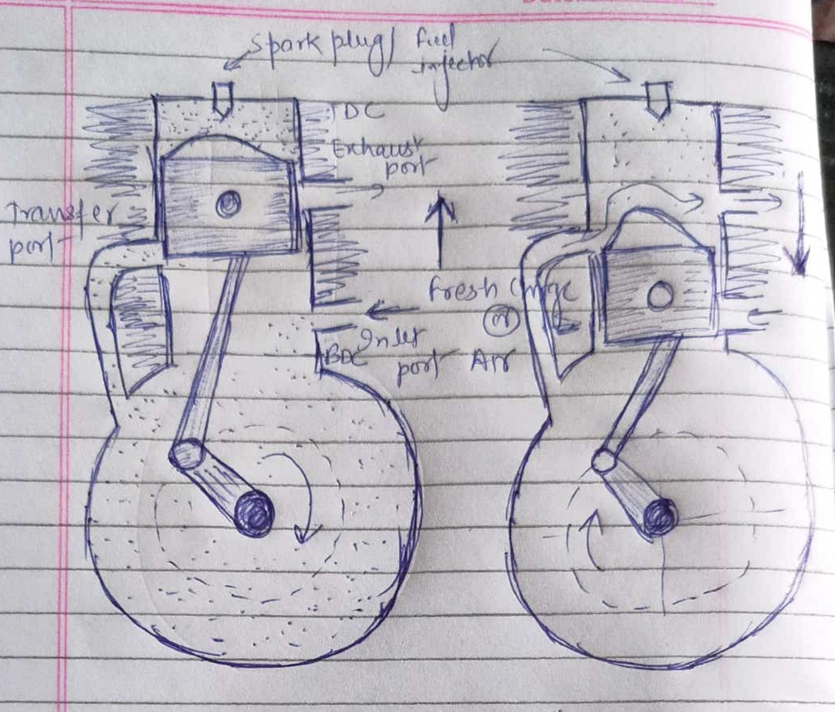
from the cylinder.

- Now the transfer port is uncovered which allows the fresh charge to come inside the cylinder from crank case. At the bottom side the inlet port is still open which allows the fresh charge to come inside the crank case.

- During the movement of piston from TDC to BDC the expansion of gases present inside the cylinder takes place.

- Crank rotates by 180° during this stroke.

→ The cycle of this engine is just completed within 2 strokes of piston and one revolution of crank and crank shaft.



(1) Upstroke (2) Downstroke

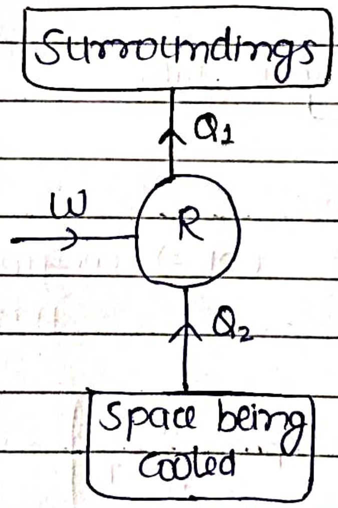
Working of 2S - Engine

Unit-3

Refrigeration & Air Conditioning

Refrigeration → The science of providing & maintaining below the surrounding is termed as Refrigeration

Refrigerator → The Machine which is used to remove heat from a body at low temperature level and transfer this heat to another body at comparitively higher temperature level generally refrigerator is used to preserve food items, drugs at low temperature.



$T < T_{atm}$

$(COP)_R = \frac{\text{Desired Effect}}{\text{Work Input}}$ OR $\frac{\text{Refrigerating effect}}{\text{Work Input.}}$

$$\boxed{(COP)_R = \frac{Q_2}{W}}$$

COP ⇒ coefficient of performance

According to principle of Energy conservation

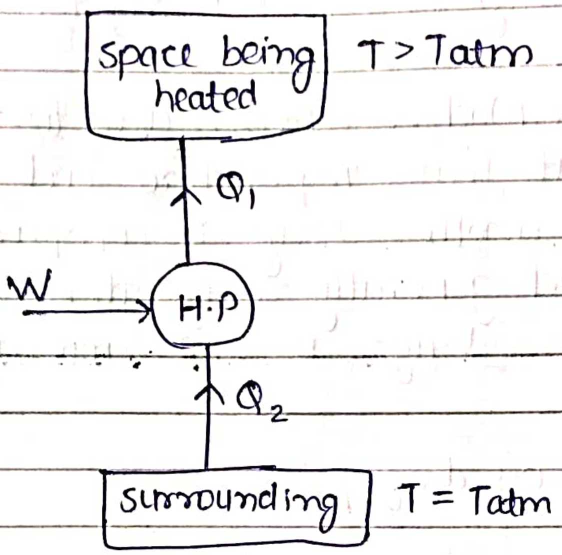
$$W = Q_1 - Q_2$$

$$\boxed{(COP)_R = \frac{Q_2}{Q_1 - Q_2}} \quad \text{or} \quad \boxed{(COP)_R = \frac{T_2}{T_1 - T_2}}$$

Q) Prove $(COP)_{HP} = 1 + (COP)_R$ ***

Heat Pump → This machine is used to heat a medium which may already be warmer than its surrounding is known as heat pump

for eg:- blower.

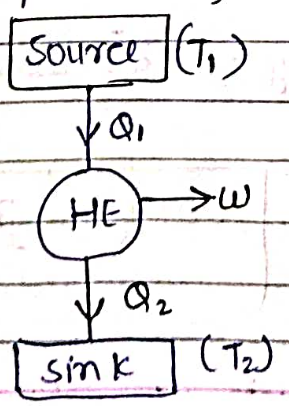


$(COP)_{H \cdot P} = \frac{\text{Desired Effect}}{\text{Work input}}$ COP ⇒ coefficient of performance

$= \frac{Q_1}{W}$

$\boxed{(COP)_{H \cdot P} = \frac{Q_1}{Q_1 - Q_2}}$ OR $\boxed{COP_{H \cdot P} = \frac{T_1}{T_1 - T_2}}$

Heat Engine ⇒ This heat machine is used for continuous production of work from heat when operating in a cyclic process. for eg:- Petrol Engine, Diesel Engine



$\eta_{HE} = \frac{\text{Output}}{\text{Input}}$

$= \frac{W}{Q_1}$

$\boxed{\eta_{HE} = \frac{Q_1 - Q_2}{Q_1}}$ or $\boxed{\eta_{HE} = \frac{T_1 - T_2}{T_1}}$

Important

1-Ton Refrigeration (1TR) ⇒ 1-Ton Refrigeration is defined as the amount of heat which is to be extracted from 1 ton of water at 0°C, in order to convert it into ice at 0°C in 24-hours.

$$Q = mL \quad \text{when, } m = 1 \text{ ton} = 907 \text{ kg}$$

$$L = 334 \ \frac{KJ}{kg}$$

latent heat of fusion

$$= \frac{907 \times 334}{60 \times 60} \ \frac{KJ}{min}$$

$$\boxed{Q = 210 \ KJ/min}$$

$$= \frac{210}{60} \ \frac{KJ}{s}$$

$$\boxed{Q = 3.5 \ KW}$$

$$\boxed{\begin{array}{l} 1\,TR = 210\,KJ/min \\ \quad\text{or} \\ \quad = 3.5\,KW \end{array}}$$

Q1) A capacity of a refrigeration system is specified to be 12 tons. What is the cooling rate of the machine

(ii) 250 L of drinking water is required per hour at 10°C. Would the use of 1.5 ton refrigerating system be justified if the available water is at 30°C.

(iii) ~~The~~ A refrigeration machine takes 1.25 KW and produces 25 Kgm of ice per hour at 0°C from water available at 30°C. Determine the refrigerating effect tonnage and coefficient of performance of machine.

Given the specificiet heat of water 4.28 KJ/kg K and Enthalpy of solidification of water from 0°C to ice at 0°C = 335 KJ/kg

(iv) If a carnot heat engine is made to work b/w above mentioned temp. limit. what would be its efficiency.

~~TR = 210 ~~

Sol) (i) capacity of refrigerating system = 12 ton

$$1\,TR = 3.5\ kW$$
$$12\,TR = 12 \times 3.5\ kW$$
$$\boxed{\text{cooling effect} = 42\ kW}$$

(ii) $w\ (30°C) \longrightarrow w\ (10°C)$

$$Q = mc\Delta t$$
$$m = 250\ \text{Lit/hour} \qquad (1L = 1kg)$$
$$c = 4.18\ KJ/Kg\,K$$
$$\Delta t = 30 - 10 = 20K$$

$$Q = 250 \times 4.18 \times 20\ \frac{KJ}{hour}$$

$$Q = \frac{250 \times 4.18 \times 20}{60 \times 60}\ \frac{KJ}{sec}\ \text{or}\ kW$$

$$\left\{\begin{array}{l} 1\,TR = 210\ KJ/min \\ 1\,TR = 3.5\,kW \end{array}\right\}$$

$$\boxed{Q = 5.8\,kW}\ KJ/sec$$

$$1.5\,TR = 3.5 \times 1.5\ kW$$

$$\boxed{\cancel{1.5\,TR = 5.25\,kW < 5.8\,kW}}$$

Therefore the use of 1.5 ton refrigeration machine will not be sufficient.

(iii) $m = 25\ kg/hour$

$$W(30°C) \xrightarrow{Q'} W(0°C) \xrightarrow{Q''} ice\ (0°C)$$

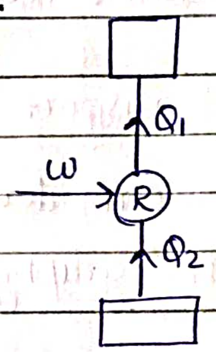
$$\boxed{RE(Q_2),\ TR,\ COP} = ?$$

$$Q = Q' + Q''$$

$$Q = mc\Delta t + mL$$

$$Q = (25 \times 4.18 \times 30) + (25 \times 335)\ KJ/hour$$

$$\boxed{Q = 3.19\ KW} = RE$$ → Refrigerating Effect



$$3.5\ KW = 1\ TR$$

$$1\ KW = \frac{1}{3.5}\ TR$$

$$3.19\ KW = \frac{3.19}{3.5}\ TR$$

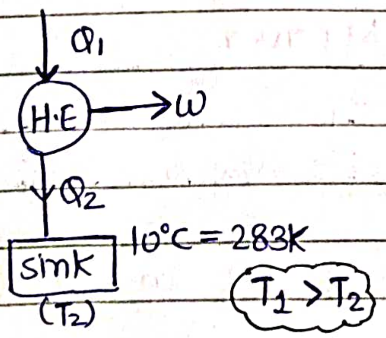
$$= 0.993\ TR$$

$$COP = Q/W$$

$$COP = 3.19/1.25$$

$$COP = 2.55$$

(iv) Source (T_1) $30°C = 303K$



$T_1 = 303K,\ T_2 = 283K$

$$\eta = \frac{W}{Q_1} = \frac{Q_1 - Q_2}{Q_1} \quad (Q \propto T)$$

$$\eta = \frac{T_1 - T_2}{T_1}$$

$$\eta = \frac{303 - 283}{303} = \frac{20}{303}$$

$$\boxed{\eta = 0.067} \Rightarrow \boxed{\eta = 6.7\%}$$

Application of Refrigeration :-

(i) Domestic Refrigerator
(ii) Commercial Refrigerator
(iii) Water coolers
(iv) Industrial Refrigerator eg → oil refinaries, cold store, chiller units, chemical refrigerator etc
(v) Transport refrigeration.
(vi) In computer centre, formacuiticals, printing and photography production shop laboratory.

V.V.IMPT (10marks)

Vapour compression Refrigeration cycle (VCR cycle)

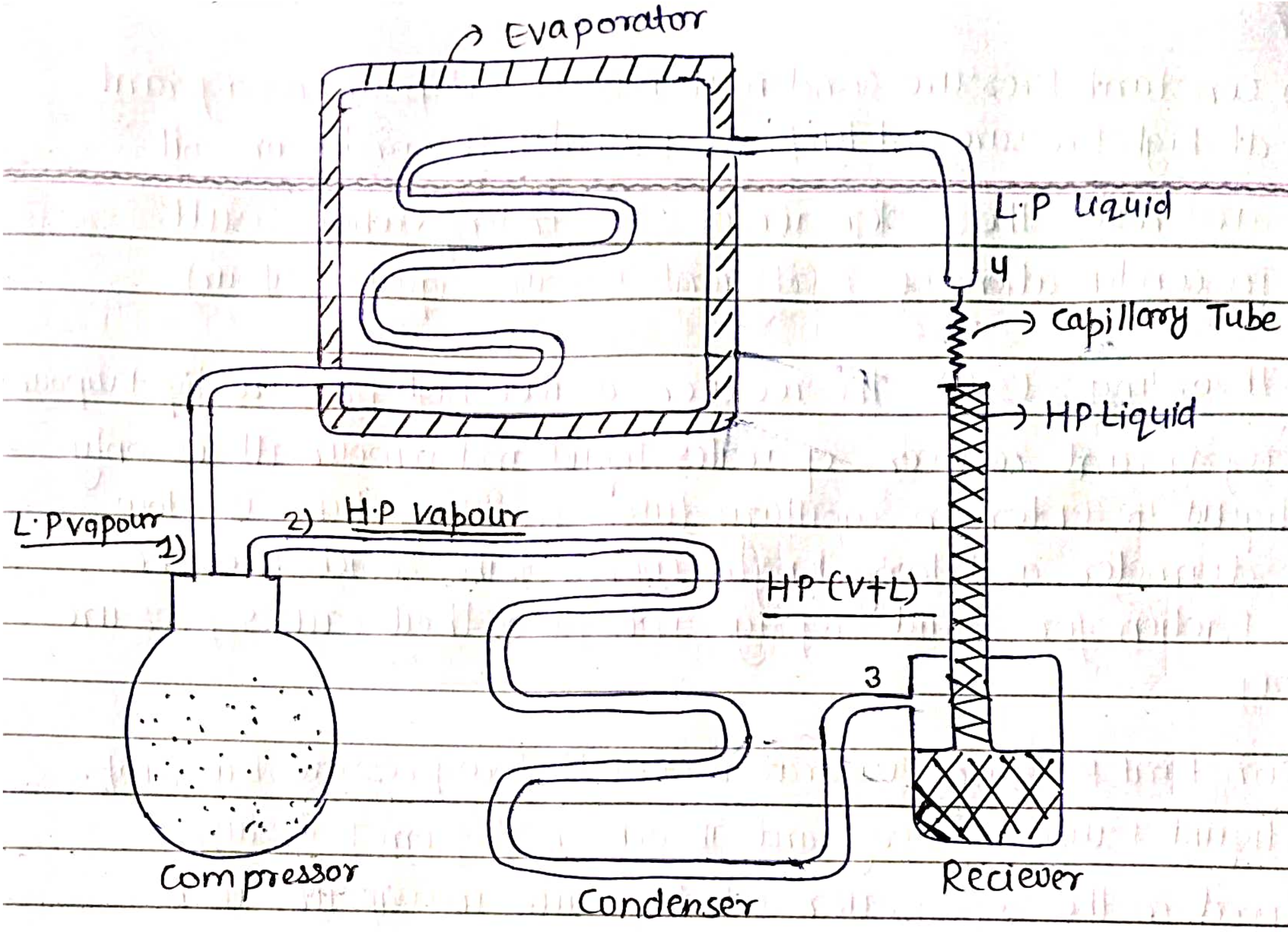
OR

Construction ~~or~~ and working of domestic refrigerator

① ⇒ Domestic refrigerator works on vapour compression Refrigeration cycle.

② It consist of following part
(i) Compressor (ii) Condenser (iii) Receiver
~~(iv) Capillary Tube (expansion device)~~
(v) evaporator

All these part are connected as shown in the figure



The refrigerant flow through various component & change its phase by transfering its heat when works on close cyclic operation. The sequence of operations of refrigeration cycle is

(i) Reversible adiabatic compression. (1-2)
Reversible adiabatic compression take place in compressor takes low pressure and temp. vapour coming out of evaporator during suction stroke.
The compressor compresses the vapour and raises its pressure & temp.

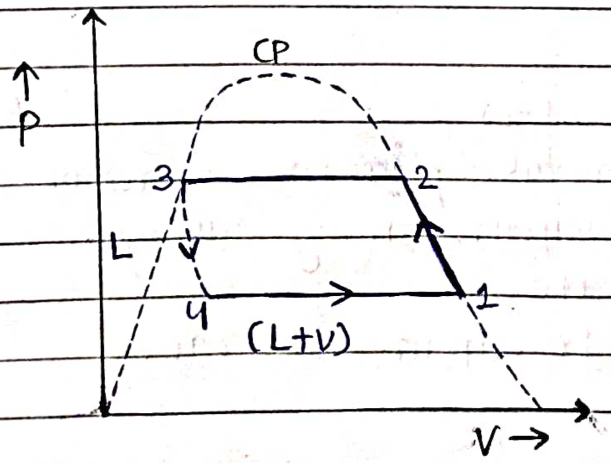
Reciprocating compressions are generally thermetically shield (compressor and electric motor are enclosed in the same container)

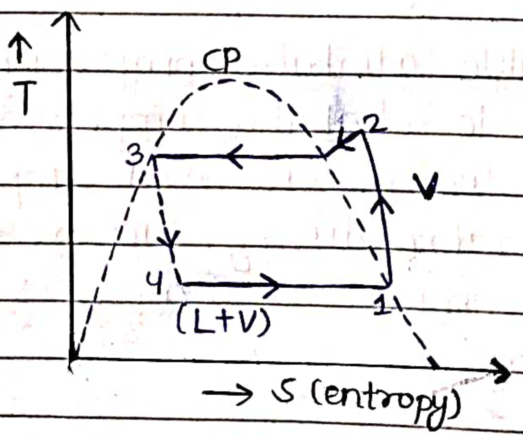
2) Constant Pressure Condensation (2-3) ⇒ Vapour refrigerant at high pressure and temp. is pushed into condensor coil and meets the cooler air of surrounding which results in condensation of refrigerant vapour (liquid + vapour)

3) Throttling :- (3-4) The reciever recieve high pressure liq. + vapour refrigerant reciever separates liquid and vapour allows only liquid to enter in capillary tube. Capillary tube is a low diameter and long length copper tube which increases friction for liquid refrigerant flow that causes pressure drop

4) Constant Pressure Evaporation → (4-1) Low pressure, low temp. liquid + vapour refrigerant absorbs heat from food stuff copped in the refrigerator which results in vapourisation of refrigerant at constant pressure.
The cycle completes and the process starts all over again.

5) PV and TS diagram for VCR cycle

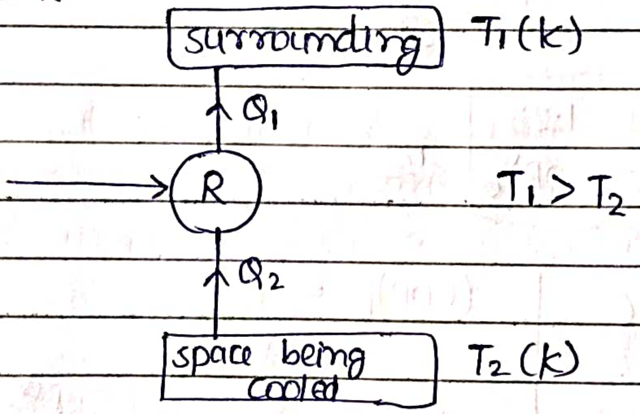




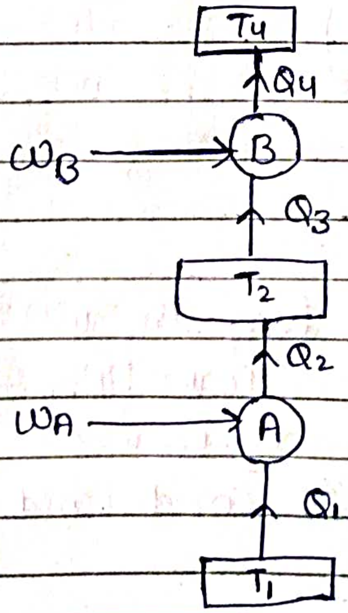
Ques) Two refrigerator 'A' & 'B' operates in series. The refrigerator A absorb energy at rate 1.2 KJ/sec from a body at temp. 310K and rejects this energy as heat to a body at temp. 'T' K. The refigerator B absorbs the same quantity of energy which is rejected by refigerator A from the body at 'T'K and rejects energy as heat to a body at temp. 1020 K. If both the refrigerator have same COP. calculate

① Temp. T of the body
② The COP of refrigerator
③ The rate at which energy is rejected as heat to the body at 1020 K.

Sol)



$$(COP)_R = \frac{Q_2}{W} = \frac{Q_2}{Q_1 - Q_2} = \frac{T_2}{T_1 - T_2}$$



given:-

$Q_1 = 1.2 \, KJ/s$

$T_1 = 310 \, K$

$T_2 = T \, K$

$Q_2 = Q_3$

$T_3 = 1020K$

$(COP)_A = (COP)_B$

To find:-

$T = ?$

$(COP)_A$ & $(COP)_B = ?$

$Q_4 = ?$

$$(COP)_A = (COP)_B$$

$$\cancel{\frac{Q_1}{W_A} = \frac{Q_3}{W_B}}$$

$$\cancel{\frac{Q_1}{Q_1 - Q_2} = \frac{Q_2}{Q_3 - Q_2}}$$

$$\cancel{\frac{T_1}{T_1 - T_2} =}$$

$$\frac{T_1}{T_2 - T_1} = \frac{T_2}{T_3 - T_2}$$

$$\frac{T_1}{T - T_1} = \frac{T}{T_3 - T_2}$$

$$T = \sqrt{T_1 T_3}$$

$$\boxed{T = 562.3K}$$

Now,

$$(COP)_A = (COP)_B = \frac{T_1}{T_2 - T_1}$$

$$= \frac{310}{562.3 - 310}$$

$$\boxed{\begin{aligned}(COP)_A &= 1.23\\ &= (COP)_B\end{aligned}}$$ ans

Now,

$$(COP)_A = 1.23 \;($$

$$1.23 = \frac{Q_1}{Q_2 - Q_1}$$

using this equation

$$Q_1 = 1.2\,KJ/s$$

$$\boxed{Q_2 = 2.18\,KJ/s}$$

$$(COP)_B = \frac{Q_3}{Q_4 - Q_3}$$

$$(Q_3 = Q_2)$$

$$1.23 = \frac{Q_2}{Q_4 - Q_2}$$

$$\boxed{Q_4 = 3.95\,KJ/s}$$

Unit 3-B Air Conditioning

→ Air conditioning is the process of treating the air to control simultaneously, temperature, humidity, cleanliness and distribution to meet the comfort requirement of the occupants of the conditioned space

Air conditioning → Simultaneous control of
- → Temperature → heating / cooling
- → Humidity → Humidification / Dehumidification
- → Cleanliness → Odour / Ventilation / filteration
- Distribution to space

* Application :-

In metal industries, electronic industries, food and process industry, residential & office buildings, hospitals, cinema halls and departmental stores and transportation

1) Humidity

→ It refers to the water content in air.

2) Absolute humidity

→ It represents the amount of water vapour present in the air in unit volume

Unit → (g/m³ of air)

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3) Specific humidity or Humidity ratio or moisture content (W)

→ It is the ratio of mass of water vapour in the air to the mass of dry air in a given volume

$$\boxed{W = \frac{m_v \text{ (mass of water vapour)}}{m_{(a)} \text{ (mass of dry air)}}}$$

V = constant

or $\boxed{W = \frac{\rho_v}{\rho_a}}$ OR $\boxed{W = 0.622 \frac{P_v}{P_a}}$

where $P_a = P_t - P_v$

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IMPT

4) Relative humidity (ϕ or RH) $\Rightarrow$ RH is the ratio of amount of water vapour present in a given volume of air to the maximum amount of water vapour that air could hold under the same temp. & pressure.

$$\boxed{RH \text{ or } \phi = \frac{\text{mass of water vapour in a given V}}{\text{max. mass of water vapour in the same V}} \%}$$

P, T $\rightarrow$ constant

(5) Degree of Saturation (μ):-

It is the ratio of mass of water vapour associated with unit mass of dry air to the mass of water vapour associated with unit mass of dry air saturated at same temperature

$$\mu = \left|\frac{\omega}{\omega_s}\right|_{T=\text{const.}}$$

$\mu = 1$, $\omega = \omega_s$
which implies that air is holding maximum amount of water vapour.

$\Rightarrow$ Thus, the degree of saturation is a measure of capacity of water to absorb moisture.

(6) Dry Bulb Temperature (DBT)

It is the temp. of air vapour mixture as recorded by any temperature measuring device

~~Reading in DC → I_{DC}~~ ~~Reading in AC →~~

~~Heat in DC → $i_{DC}^2 RT$~~ ~~Heat in AC~~

$\boxed{WBT < DBT}$

7) Wet Bulb Temperature ⇒ (WBT)

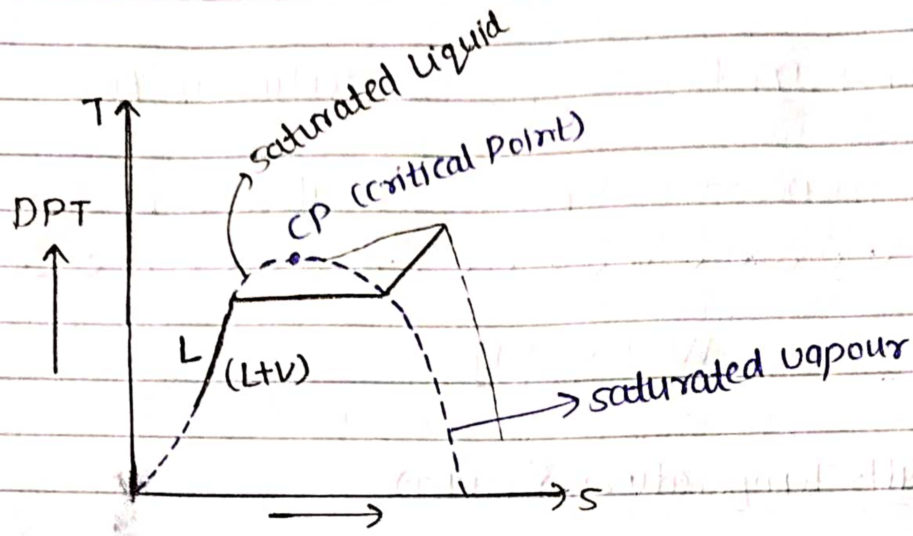
It is the temperature of air vapour mixture recorded by thermometer whose bulb is covered by wet wick

When the air passes over the wet wick the moisture contained in wick tends to evaporate that produces cooling effect at bulb at equilibrium temperature is recorded lower than that of air stream.

$\boxed{WBT < DBT}$

8) Dew Point Temperature (DPT)

The temperature at which the air and water vapour mixture become saturated that is the moisture (water vapour) begins to condence consiquent to the continuous cooling at constant pressure.



9) Wet Bulb Depression (WBD):-

It is the difference of DBT and WBT

$$\boxed{WBD = DBT - WBT}$$

If humidity is 100%

*** $\boxed{\begin{matrix} DBT = WBT \\ WBD = 0 \end{matrix}}$

Ques) To prove $(COP)_{H.P} = 1 + (COP)_R$

Sol) ~~we know that~~

$$(COP)_{HP} = \frac{Q_1}{Q_1 - Q_2} \quad \text{—— (1)} \quad \& \quad (COP)_R = \frac{Q_2}{Q_1 - Q_2} \quad \text{—— (2)}$$

(1) - (2) gives

$$(COP)_{HP} - (COP)_R = \frac{Q_1}{Q_1 - Q_2} - \frac{Q_2}{Q_1 - Q_2} = \frac{Q_1 - Q_2}{Q_1 - Q_2} = 1$$

$$\boxed{(COP)_{HP} = 1 + (COP)_R}$$ hence proved

V. V.V IMPT

Construction and Working of Window Air Conditioner

→ ① Air conditioner is an assembly of different components used to produce comfortable conditions of air within close phase.

② The human comfort conditions are:-

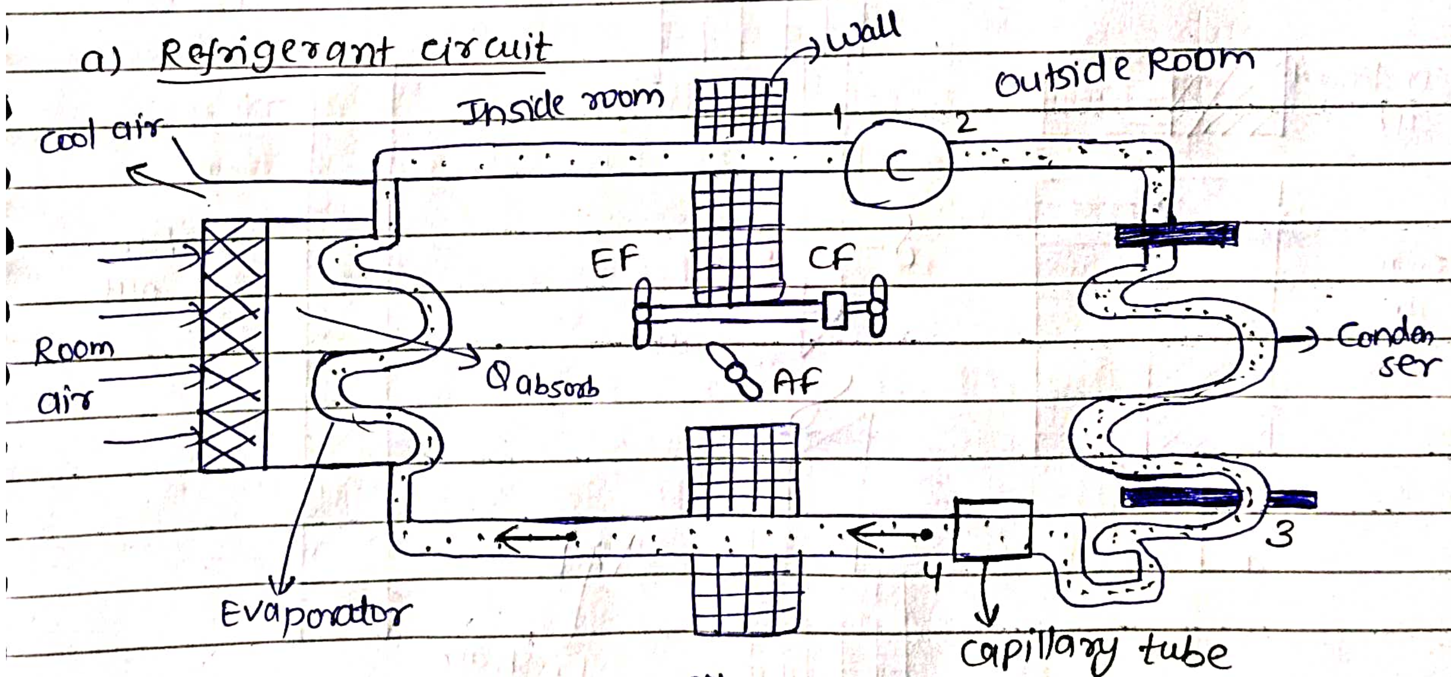
(i) Temperature (22°C to 25°C)
(ii) Relative Humidity (40% to 60%)
(iii) Air velocity (5m/min to 8m/min)

(3) The basic components of air conditioning unit are

(i) Compressor (ii) Condensor (iii) Expansion device
(iv) Evaporator (v) Condensor fan (vi) Evaporator fan
(vii) Auxillary Fan

4) The basic component of an air conditioning unit are arranged as shown in the fig.

a) Refrigerant circuit



→ When the power is switched ON, the motor compressor unit starts running.

→ The refrigerant ~~vapours at low temp. and pressure~~ coming from evaporator enter the compressor

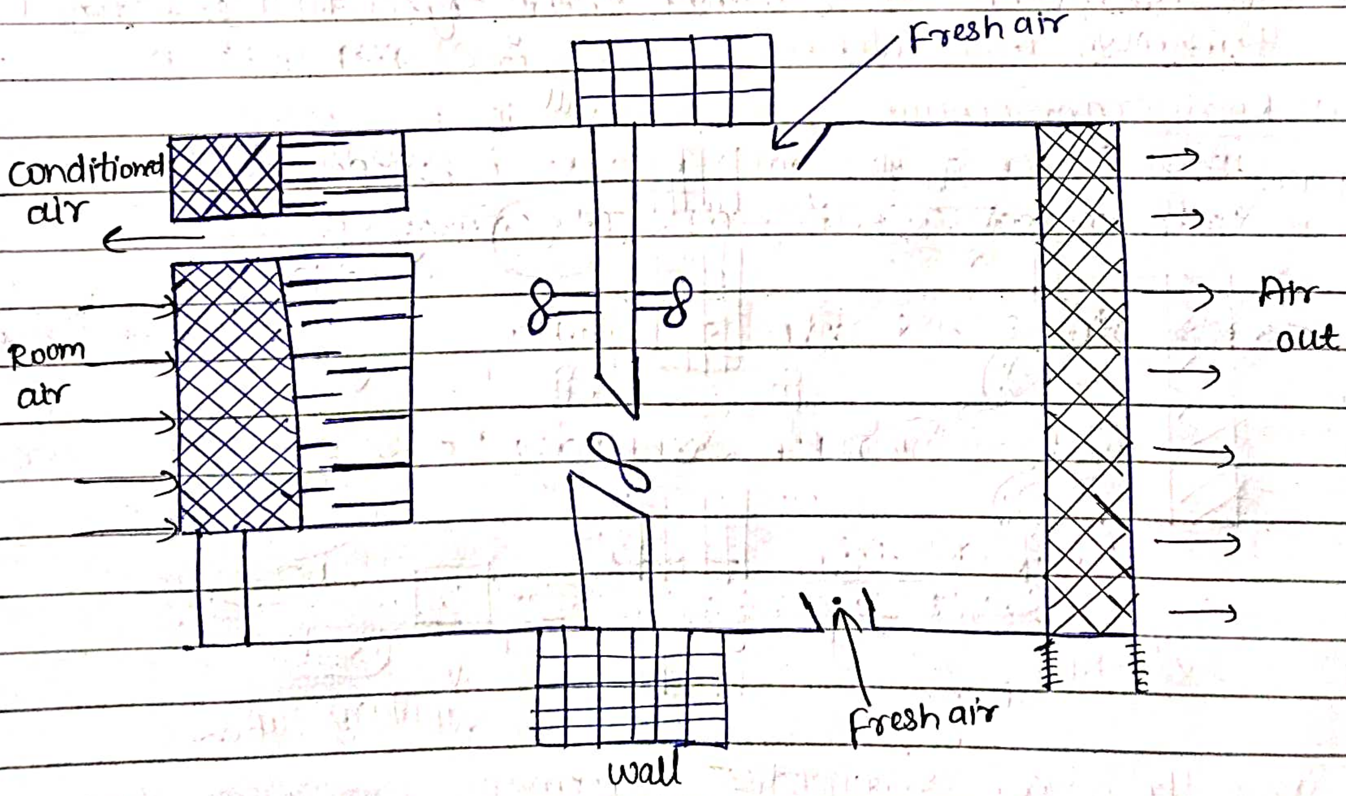
→ The vapours are compressed (increase in pressure and temperature) these compressed vapours enter the condenser where they interact with outside air and consumes the heat.

→ The condensed vapour enter the capillary tube where the throttling of condensed vapour takes place

→ The low pressure liquid refrigerant now enter the evaporator, absorbs the latent heat of vapourisation from the room air that results in cooling of this air. The cooled air is directed ~~to~~ through a duct passage in front cover grill that provides comfortable cooling conditions in the air.

→ Now the refrigerant air leave the evaporator and enter the compressor for next working cycle

→ The air circuit diagram of window AC is also shown in fig.



Method of Refrigeration (From book for university)

less Asked