State the applications of gas turbine (any four).

Following are the applications of gas turbine

1. It is used for electric power generation.

2. It is used for locomotive propulsion.

3. It is used for ship propulsion.

4. Gas turbine is used in aircrafts.

5. It is used for supercharging for heavy duty Diesel engines.

6. Used in turbo jet and turbo-propeller engine.

7. It is used for various industrial purpose such as in steel industry, oil and other chemical industry.

Enlist different uses of compressed air.
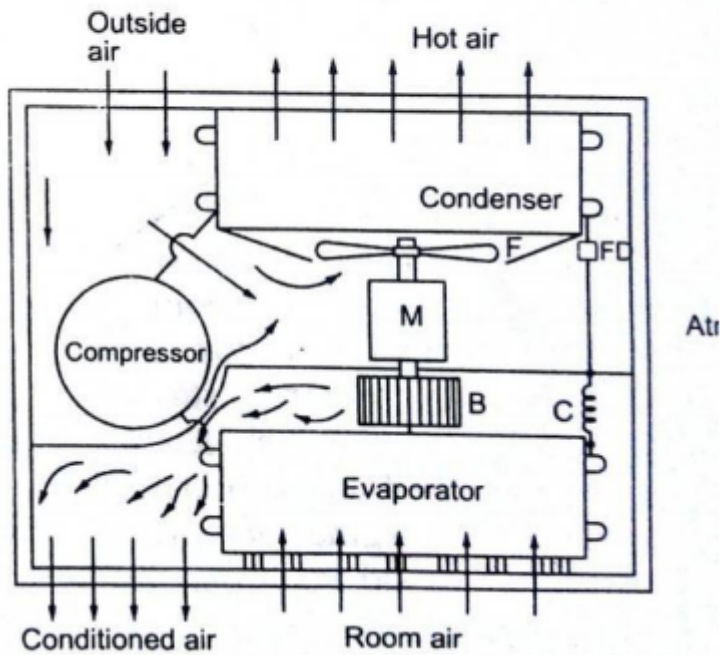
Following are the applications of compressed air

1) To drive air motors in coal mines.

2) To inject fuel in air injection diesel engines.

3) To operate pneumatic drills, hammers, hoists, sand blasters.

4) For cleaning purposes.

5) To cool large buildings.

6) In the processing of food and farm maintenance.

7) For spray painting in paint industry.

8) In automobile & railway braking systems.

9) To operate air tools like air guns.

10) To hold & index cutting tools on machines like milling

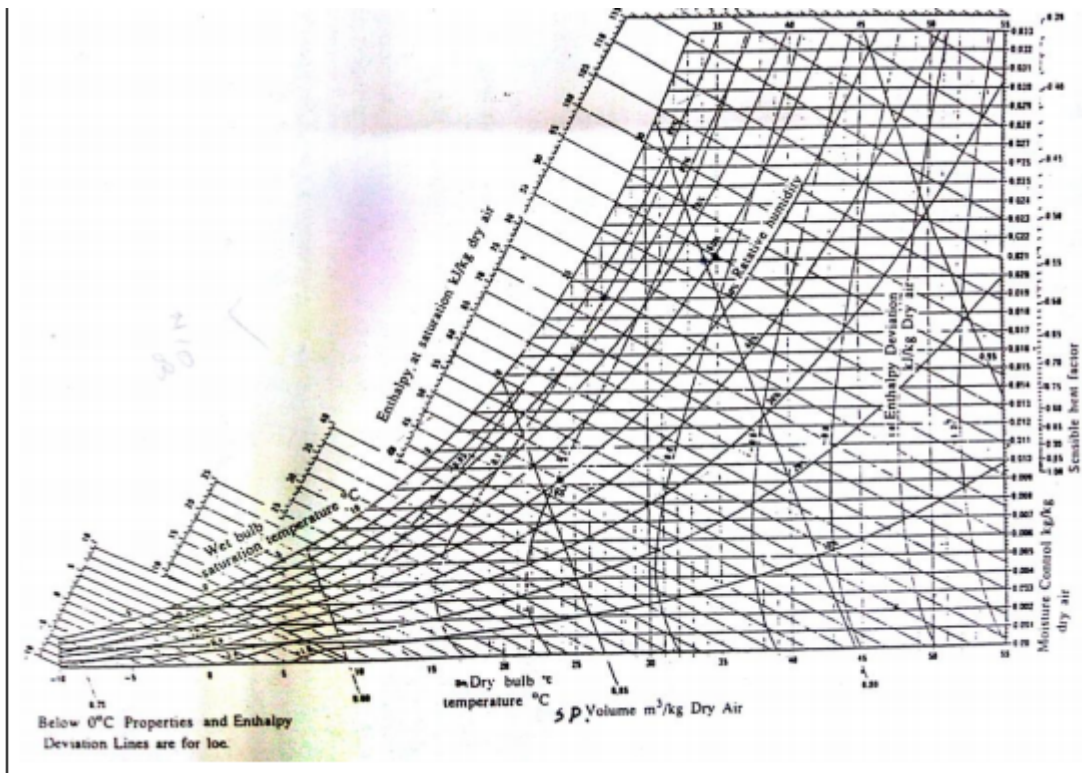
Draw only a neat labelled sketch of window air-conditioner.

Sketch of window air conditioner

B = Blower   F = Fan
C = Capillary tube   M = Motor
FD = Fitter/Dryer

Outside air   Hot air

Condenser

F   FD

M   Atr

Compressor

B   C

Evaporator

Conditioned air   Room air

Sketch a psychrometric chart and show the following properties of air on it.....

Enthalpy at saturation kJ/kg dry air

Wet bulb saturation temperature

Dry bulb temperature °C

Below 0°C Properties and Enthalpy Deviation Lines are for Ioe.

Enthalpy Deviation kJ/kg Dry air

Sensible heat factor

Moisture Control kg/kg dry air

5 p Volume m³/kg Dry Air

Explain the following terms :- i) Daltons law of partial pressures

i) Daltons Law of partial pressure – It states that the total pressure of mixture of gases is equal to the sum of the partial pressures exerted by each gas when it occupies the mixture volume at the temperature of mixture.

Consider mixture of gas having constituents as gas a. gas b, gas c

Then, Total pressure $P_t = P_a + P_b + P_c$

ii) Relative humidity:- It is defined as the ratio of partial pressure of water vapour in a given volume of mixture to the partial pressure of water vapour when same volume of mixture is saturated at the same temperature.

$$\therefore \phi = \frac{\frac{P_v}{P_v sat} \times 100}{}$$

List out different pollutants in exhaust gases of petrol and diesel engine.....

The major air pollutants emitted by petrol & diesel engines are CO2, CO, HC, NOx, SO2, smoke & lead vapour.

Effect of CO: ☐ Carbon monoxide combines with hemoglobin forming carboy

hemoglobin ,which reduces oxygen carrying capacity of blood. ☐ This leads to laziness, exhaustion of body & headache. ☐ Prolong exposure can even leads to death. ☐ It also affects cardiovascular system, thereby causing heart problem Effect of CO2: Causes respiratory disorder & suffocation.

State the applications of reciprocating compressor......

Applications of Reciprocating Compressor 1. In spray painting shop. 2. In workshop for cleaning machines. 3. For operation of pneumatic tool like rock drill, vibrator etc. 4. In automobile service station to clean vehicle. 5. To drive air motors in coal mines. 6. Food and beverage industry

State the methods to improve efficiency of air compressor.......

Following are the methods to improve efficiency of air compressor 1. Cooling cylinder by spraying water during compression stroke. 2. Circulation of water surrounding to cylinder by providing jackets 3. Installing inter cooler between two cylinders 4. Providing greater fins on cylinder 5. By selecting suitable material for cylinder 6. By providing suitable choice of cylinder proportions i.e. short stroke and large bore in construction with sleeve valve Two stage reciprocating air compressor :

Draw superimposed p-v diagram of Otto cycle, Diesel cycle and Dual cycle to compare their efficiencies for same compression ratio (R c) and heat rejection (Q r).

Superimposed P-V Diagram of Otto, Diesel & Duel Cycle: A comparison of the cycles (Otto, Diesel and Dual) on the p-v and T-s diagrams for the same compression ratio and heat supplied is shown in the Fig. Since all the cycles reject their heat at the same specific

volume, process line from state 4 to 1, the quantity of heat rejected from each cycle is represented by the appropriate area under the line 4 to 1 on the T-s diagram. As is evident from the cycle which has the least heat rejected will have the highest efficiency.

What is meant by catalytic converter ?....................

Catalytic converter:
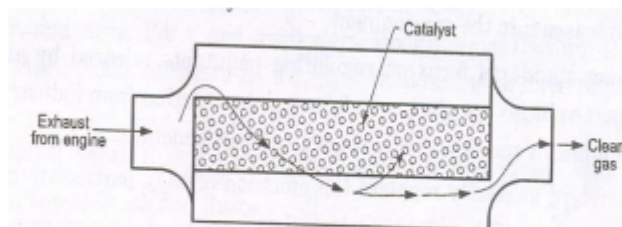
Catalytic converter is a device which converts harmful pollutants to

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