
Define : i) Isothermal efficiency.

i) Isothermal efficiency – It is defined as the ratio of isothermal power to the indicated or actual power. Isothermal efficiency = Isothermal power / Indicated power.

ii) Volumetric efficiency – It is the ratio of actual volume of the free air delivered at standard atmospheric condition at discharge in one delivery stroke to the swept volume by the piston during the stroke.

Write any four applications 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.

Compare reciprocating and rotary compressors (any four).

Reciprocating compressor	Rotary compressor		
1. Compression of air takes place with help of piston and cylinder arrangement with reciprocating motion of piston.	1. Compression of air takes place due to rotary motion of blades.		
2. Delivery of air intermittent.	2. Delivery of air is continuous.		
3. Delivery pressure is high i.e. pressure ratio is high.	3. Delivery pressure is low, i.e. pressure ratio is low.		
4. Flow rate of air is low.	4. Flow rate of air is high.		
5. Speed of compressor is low because of unbalanced forces.	5. Speed of compressor is high because of perfect balancing.		
6. Reciprocating air compressor has more number of moving parts.	6. Rotary air compressor has less number of moving part.		
7. It needs proper lubrication and more maintenance.	7. It required less lubrication and maintenance.		
8. Due to low speed of ration it can't be directly coupled to prime mover but it requires reduction of speed.	8. Rotary air compressor can be directly coupled to prime mover.		
9. It is used when small quantity of air at high pressure is required.	9. It is used where large quantity of air at lower pressure is required.		

Explain construction and working of single stage

reciprocating air compressor

In single stage reciprocating air compressor, the entire compression is carried out in a single cylinder. The opening & closing of a simple check valve (plate or spring valve) depends upon the difference in pressure, if mechanically operated valves are used for suction & discharge then their functioning is controlled by cams. The weight of air in the cylinder will be zero when the piston is at top dead centre. At this position, you have to neglect clearance volume.

Explain with neat sketch working principle of Lobe compressor

Rotary Lobe type Air Compressor has two mating lobe-type rotors mounted in a case. The lobes are gear driven at close clearance, but without metal-to-metal contact. The suction to the unit is located where the cavity made by the lobes is largest. As the lobes rotate, the cavity size is reduced, causing compression of the vapor(air) within. The compression continues until the discharge port is reached, at which point the vapor exits the compressor at a higher pressure.

Give the classification of air-compressors

Classification of Air compressors: 1. According to principle: a. Reciprocating air compressors b. Rotary air compressors

2. According to the capacity a. Low capacity air compressors b. Medium capacity air compressors c. High capacity air compressors

3. According to pressure limits a. Low pressure air compressors b. Medium pressure air compressors c. High pressure air compressors

4. According to method of connection a. Direct drive air compressors b. Belt drive air compressors c. Chain drive air compressors

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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

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

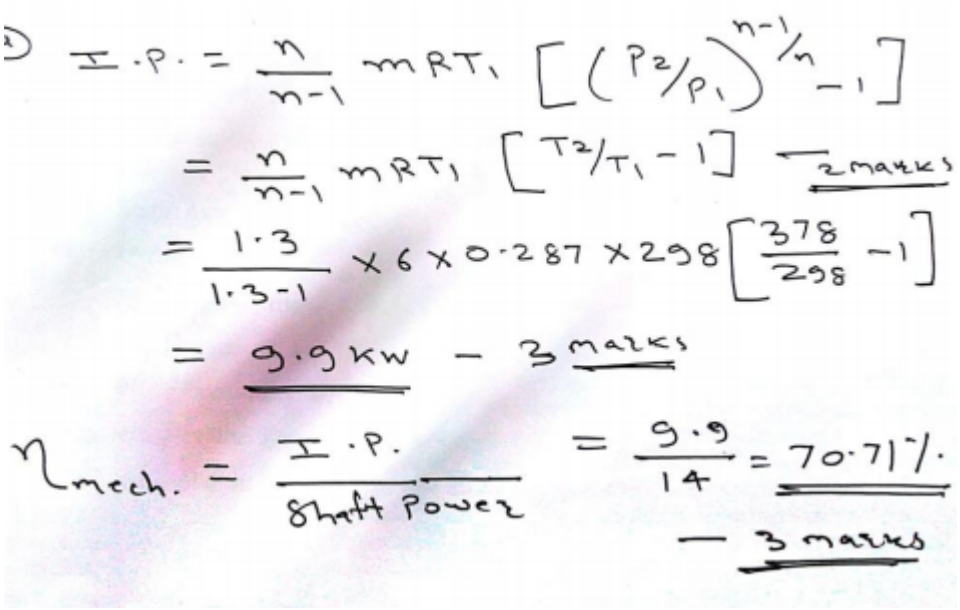
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State the methods to improve efficiency of air compressor.....

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 :

Reciprocating air compressor draws 6 kg of air per minute at

25°C. It compresses the air....



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