

Question Bank (I scheme)

Name of subject: POWER ENGINEERING & REFRIGERATION

(PER 22562)

Unit Test: I

Course: ME

Semester: V

Chapter 3: CO3 (Air Compressors) (2 Marks)

- 1) Define the term i) Compression Ratio. ii) Free Air Delivery (FAD)
- 2) Enlist the uses of compressors.
- 3) Explain need of multi-staging.
- 4) State the methods to improve efficiency of air compressor.
- 5) Explain the term swept volume w.r.t Reciprocating air compressors.

Chapter 3: CO3 (Air Compressors) (4 Marks)

- 1) Give the classification of air compressors.
- 2) Explain two stage air compressor with perfect intercooling.
- 3) Differentiate between Reciprocating and Rotary compressors.
- 4) Reciprocating air compressor draws 6 kg of air per minute at 25⁰C. It compresses the air polytropically and delivers it at 105⁰C. Find the work required for the compression and air power. Also find mechanical efficiency, if shaft power is 14 KW. Assume $R = 0.287 \text{ KJ/Kg K}$ and $n=3$.
- 5) A single cylinder reciprocating compressor has a bore of 120 mm and a stroke of 150 mm and is driven at a speed of 1200 rpm. It is compressing CO₂ gas from a pressure of 120Kpa and the temperature of 20⁰C to a temperature of 215⁰C. Assuming polytropic compression with $n = 1.3$, no clearance and volumetric efficiency of 100 %, calculate i) Pressure Ratio ii) Indicated Power iii) Shaft power with mechanical efficiency 80 %, iv) Mass flow rate.

Chapter 4: CO4 (Gas Turbines and Jet propulsion) (2 Marks)

- 1) Classify gas turbines on the following basis i) Working cycle ii) cycle of operation
- 2) Enlist fuels used in gas turbines.
- 3) Draw P-V and T-S diagram of Brayton cycle.
- 4) State the any two advantages of closed cycle gas turbines.
- 5) Give any four applications of gas turbines.

Chapter 4: CO4 (Gas Turbines and Jet propulsion) (4 Marks)

- 1) Differentiate between closed cycle and open cycle gas turbine
- 2) State the methods to improve thermal efficiency of gas turbine and explain any one.
- 3) Explain working of Turbo Prop engine with neat sketch
- 4) Draw the schematic diagram of turbojet engine.

Chapter 5: CO5 (Refrigeration and air conditioning) (2 Marks)

- 1) Define COP of refrigerating unit.
- 2) State Tonnes of refrigeration.
- 3) Define specific humidity
- 4) Define Dew point temperature and Wet bulb temperature.
- 5) Represent Sensible cooling and Evaporative cooling on Psychrometric chart.

Chapter 5: CO5 (Refrigeration and air conditioning) (4 Marks)

- 1) Draw neat labelled sketch of window air conditioner.
- 2) Explain the effect of superheating on the performance of vapour compression cycle.
- 3) Name the refrigerants used for:
 - i) Water cooler
 - ii) Domestic refrigerator
 - iii) Ice Plant
 - iv) Cold Storage
- 4) Explain Construction of Ice plant with neat sketch.
- 5) Differentiate between Unitary and Central air conditioning system.