

Roll No.

Total No. of Questions : 09]

[Total No. of Pages : 01

B.Tech. (Sem. – 3rd)
APPLIED THERMODYNAMICS
SUBJECT CODE : AE - 205

Paper ID : [A0704]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section – A

(10 × 2 = 20)

- Q1)** a) List out the merits and demerits of liquid fuels over solid fuels.
 b) Define molecular mass.
 c) What is the difference between rotary and reciprocating compressor?
 d) Define 'prewhirl'.
 e) What do you understand by term 'psychrometry'.
 f) Define sensible heat factor.
 g) How heat transfer differ from thermodynamics.
 h) What is heat exchanger?
 i) Define heat rejection ratio.
 j) What are eco friendly refrigerants?

Section – B

(4 × 5 = 20)

- Q2)** What do you understand by 'minimum air' and 'excess air' in context of combustion?
- Q3)** Explain effect of complete and incomplete intercooling in multistage reciprocating compressor.
- Q4)** Explain, with a neat sketch, the working of a centrifugal compressor and obtain an expression for the workdone.
- Q5)** Distinguish between conduction, convection and radiation modes of heat transfer.
- Q6)** Discuss briefly the choice of refrigerant commonly used in automobiles.

Section – C

(2 × 10 = 20)

- Q7)** Explain, briefly, the method used to determine the higher calorific value of the liquid fuel.
- Q8)** A single stage single acting reciprocating air compressor is required to handle 30 m³ of free air per hour measured at 1 bar. The delivery pressure is 6.5 bar and the speed is 450 r.p.m. Allowing a volumetric efficiency of 75%; an isothermal efficiency of 76% and mechanical efficiency of 80%; calculate the indicated mean effective pressure and the power required to drive the compressor.
- Q9)** Explain and show the below mentioned process on psychrometric chart:-
 (a) Sensible Cooling
 (b) Sensible Heating