4TH SEM./MECH/MECH(IND. INTG.)/ MECH(MAINT)/ MECH(PROD)/ DME/MECH(SAND)/ 2024(S)

TH4 **Thermal Engineering-II**

Full Marks: 80 Time- 03 Hrs

Answer **Any FIVE** Questions including **Q No.1 & 2**
Figures in the right-hand margin indicates marks

1. Answer **All** questions 2 x 10

   a. Define thermal conductivity.

   b. What is a boiler?

   c. Define Mechanical Efficiency.

   d. State mean effective pressure.

   e. What do you mean by wet steam?

   f. What is steam? State various types of steam.

   g. Classify air compressor.

   h. State Newton's Law of cooling.

   i. Define Dryness Fraction.

   j. Classify an IC Engine.

2. Answer **Any Six** Questions 6 x 5

   a. State and explain Fourier's law of heat.

   b. State the significance of Mollier Chart.

   c. Discuss briefly the function of Economiser with neat sketch.

   d. Explain the working principle of Babcock Wilcox Boiler.

   e. A sample of coal has following specification. Carbon 75%, Hydrogen 6%, Oxygen 8%, Nitrogen 2.5%, Sulphur 1.5% and Ash 7%. Calculate lower and higher calorific value.

   f. Write a short note on Air-Fuel ratio.

   g Discuss about 2-stage reciprocating air compressor with inter cooler.

3	Explain different steps in Rankine cycle with neat sketch.	10
4	A single cylinder double acting steam engine has load 1500 N. the length of the stroke is 250 mm. the engine speed is 600 rpm. The indicate power is 220 kW. Determine the Torque Transmitted, Break Power and Mechanical Efficiency.	10
5	Discuss about different efficiencies of an IC Engine.	10
6	What is boiler draught? State its advantages and disadvantages.	10
7	A two-stage air compressor having initial pressure 10 bar and temperature 30°C with discharge pressure 40 bar having initial volume 0.5 m^3. Determine minimum work required and power. Take $PV^{1.3}$=Constant.	10