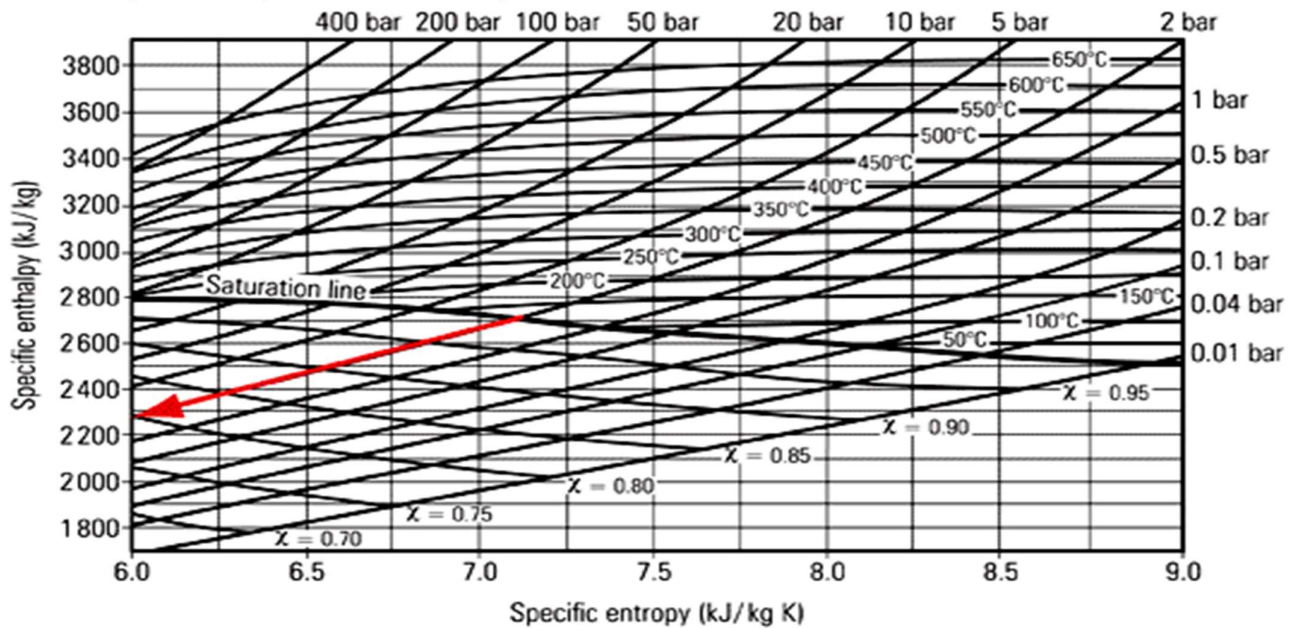


INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

Q.No	Question	CO	BL
Q.1(a)	Define Energy Audit and list types of energy audits	[2]	1 Remember
Q.1(b)	Summarize working principle of Heat Pump with neat figure	[3]	1 Understand
Q.2(a)	Illustrate extraction condensing steam turbine and reciprocating engine cogeneration systems with neat diagrams	[2]	1 Understand



Q.2(b)	Entry steam's temperature and pressure in a steam turbine cogen system are 600 °C and 50 bar respectively. Determine enthalpy of steam at entry point, at 20 bar, at 5 bar and at 1 bar pressure. Also evaluate entropy. Use above chart & make any necessary assumptions	[3]	1 Evaluating
Q.3(a)	Identify and name waste heat devices related to: (i) large mass of air with small dT (ii) temporary heat storage (iii) hot & cold fluids far away (iv) metal wick	[2]	1 Applying
Q.3(b)	Explain the LTC retort having vibrators in its design with figure & salient points	[3]	2 Understand
Q.4(a)	Contrast ranking & grading of coal and briefly summarize API gravity	[2]	2 Understand
Q.4(b)	Distinguish byproduct recovery oven & non-recovery oven with respect to: (i) heat transfer (ii) operating pressure/wall pressure (iii) pollution (iv) coke quality (v) cost/investment (vi) temperature	[3]	2 Analyzing
Q.5(a)	Define visbreaking and name catalysts used in catalytic cracking and reforming	[2]	2 Remember
Q.5(b)	Outline objectives of desalting and explain functions of reflux and reboiler along with a neat schematic of atmospheric distillation process	[3]	2 Understand