DIPLOMA EXAMINATION IN ENGINEERING / TECHNOLOGY / MANAGEMENT / COMMERCIAL PRACTICE

MODEL QUESTION PAPER
THERMAL ENGINEERING [4021]

Time: 3 hours   Maximum marks: 75

PART – A

I.   Answer *ALL* the following questions in one word or sentence.

(9 x 1= 9 marks)

		Module outcome	Cognitive Outcome
1	Define the term thermodynamic system	M1.02	U
2	State first law of thermodynamics.	M1.03	R
3	Sketch the pressure-volume diagram of the Otto cycle	M2.01	R
4	Define Indicated Power.	M2.05	U
5	Define wet steam.	M3.03	R
6	Give two examples for Fire tube boiler.	M3.05	U
7	Define the term Thermal conductivity.	M4.01	R
8	Identify different types of Heat Exchangers.	M4.05	U
9	State Planks law of thermal radiation.	M4.03	R

PART –B

II.   Answer any *EIGHT* questions from the following.

(8 x 3= 24 marks)

		Module outcome	Cognitive Outcome
1	Differentiate between intrinsic and extrinsic property.	M1.02	U
2	Define the terms Pressure, Temperature and Entropy.	M1.02	U
3	Write short note on Isobaric process.	M1.04	U
4	Differentiate two stroke engines and Four stroke engines.	M2.02	U
5	An internal combustion Engine takes in a mixture of fuel and air At 27^0C and the highest temperature after combustion is 377^0C.Calculate the Carnot efficiency of an engine working between these two limits of temperature.	M2.03	U
6	Explain Mollier chart with a sketch and indicate different conditions of steam on it.	M3.03	U
7	List boiler mountings and accessories.	M3.05	U
8	Define the term Effectiveness of a heat exchanger.	M4.05	U

9	Explain the working of centrifugal type air compressors.	M4.07	U
10	Write short notes on Free and Forced convection heat transfer.	M4.04	U

PART – C

III.   Answer *ALL* questions from the following.

(6 x 7 = 42 marks)

Module outcome   Cognitive Outcome

1	Explain the classification of thermodynamic systems. OR	M1.02	U
2	Derive characteristic gas equation.	M1.05	U
3	Compare Spark Ignition(SI) and Compression Ignition(CI) engines. OR	M2.04	U
4	A petrol engine working on ottocycle consumes 8 litres of petrol per hour when developing 25 kW indicated power.The specific gravity of petrol is 0.75 and its calorific value is 46200 kJ/kg.Determine the indicated thermal efficiency of the engine.	M2.06	U
5	Derive air standard efficiency of Otto cycle. OR	M2.01	U
6	An engine working on Carnot cycle receives heat at 700^0C and rejects heat at 50^0C.Find the air standard efficiency of the cycle.If it absorbs 4000 kJ of heat per minute from the hot body, calculate the work done and power of the engine.	M2.03	U
7	Explain the formation of steam under the effect of pressures and illustrate it with a graph.	M3.01	U
8	OR Determine from steam tables using the following data (i). Enthalpy and volume of 1 kg of steam at 12 bar and dryness fraction 0.9, and (ii) Enthalpy and volume of 1 kg of steam at 12 bar and 225'C.	M3.02	U
9	Compare Fire tube and Water tube boilers. OR	M3.05	U
10	Explain the working of Reaction type steam turbines.	M3.06	U
11	Explain different modes of heat transfer and state Fourier's law OR	M4.01	U

12	Discuss the classification of different types of air compressors. With a neat Pressure-Volume diagram, explain the working of single stage reciprocating compressor.	M4.07	U