

Model Question Paper

First Semester B.E. Degree (CBCS) Examination

Elements of Mechanical Engineering

Max. Marks: 100

Note: 1.Answer any FIVE full questions, choosing one full question from each module.

2. Use of Thermodynamic data hand book permitted.

MODULE – I

1	a b c	Enumerate the method of extracting energy from wind with a neat sketch Illustrate the formation of steam with relevant sketches. What are the different states of steam? Explain them in brief.	(08Marks) (08Marks) (04 Marks)
2	a	OR Explain Zeroth law of thermodynamics. List the similarities and dissimilarities between work and heat.	(10 Marks)
	b	A stationary mass of gas is compressed without friction from an initial stage of 0.3 m^3 and 0.105 MPa to a final state of 0.15 m^3 , the pressure remaining constant. There is a transfer of 37.6 kJ of heat from the gas during the process. How much does the internal energy of the gas change?	(10Marks)
		MODULE – II	
3	a b	With a neat sketch, explain the working of Lancashire boiler. Explain the different boiler mountings and accessories.	(10 Marks) (10 Marks)
4	a b	OR Classify Hydraulic turbines and with a neat sketch explain the working of a typical impulse turbine. Describe the working of a reciprocating pump.	(10 Marks) (10 Marks)
		MODULE – III	
5	a b	With the help of P-V diagram, explain the operation of 4-Stroke Diesel engine The following observations were recorded during a test on single cylinder diesel engine: Brake Power= 75 kW, Brake thermal efficiency= 35%, Mechanical efficiency= 90%, calorific value =40000 kJ/kg. Determinei) IP ii) FP iii) fuel consumed per hour.	(10 Marks) (10 Marks)
		OR	
6	a b c	Explain the ideal properties of refrigerant. With the help of a sketch, explain the functioning of Vapor AbsorptionSystem. List the most commonly used refrigerants.	(06 Marks) (10 Marks) (04 Marks)
		<u>MODULE – IV</u>	
7	a	Classify and explain various types of smart materials	(10 Marks)
	b	With a neat sketch explain TIG welding.	(10 Marks)
0		OR	
8	a b	Derive an expression for length of belt in cross belt drive. What are the advantages and disadvantages of gear drives over belt drives?	(10 Marks) (10Marks)

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Time: 3 hrs.



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MODULE – V

9	a	What are the various methods of producing taper turning method? Explain taper turning by swiveling the compound method.	(10Marks)
	b	Explain the following machining operations on milling machine with suitable	(101/14/145)
		sketches	(10 Marks)
		(i) Plane milling (ii) End milling (iii) Slot milling (iv) Form milling	
		OR	
10	a b	Explain the components of a CNC with a block diagram Elaborate the various robot configurations with simple sketches	(10Marks) (10 Marks)

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