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BEMEM103/203

First/Second Semester B.E./B.Tech. Degree Examination, Dec.2023/Jan.2024
Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.
3. Use of thermodynamic data handbook is permitted.

		Module – 1	M	L	C
Q.1	a.	With neat sketch, explain the working of wind power plant.	10	L2	CO1
	b.	Explain different types of steam.	6	L2	CO1
	c.	Write the properties of steam.	4	L2	CO1
		OR			
Q.2	a.	Distinguish between renewable and nonrenewable energy sources with suitable examples.	10	L2	CO1
	b.	The enthalpy of 1 kg of steam at 8 bar pressure is 2373.5 kJ/kg. Find the condition of the steam.	10	L3	CO4
		Module – 2			
Q.3	a.	With neat sketch, explain taper turning by compound rest method.	10	L2	CO2
	b.	With neat sketch, explain the following drilling operations: (i) Reaming (ii) Boring (iii) Counter sinking (iv) Taping (v) Spot facing	10	L2	CO2
		OR			
Q.4	a.	i) Differentiate between up milling and down milling.	6	L2	CO2
		ii) Explain the following: (1) End milling (2) Slot milling	4	L2	CO2
	b.	With neat sketches, explain the different components of CNC machine.	10	L2	CO2
		Module – 3			
Q.5	a.	With neat sketches, explain the working of four stroke petrol engine with P-V diagram.	10	L2	CO2
	b.	A single cylinder four stroke engine runs at 1000 rpm and has a bore of 115 mm and has a stroke of 140 mm. The brake load is 60 N at 600 mm radius and the mechanical efficiency is 80%. Calculate brake power and mean effective pressure.	10	L3	CO4
		OR			
Q.6	a.	i) What are desirable properties of refrigerant?	4	L2	CO2
		ii) Compare vapor compression and vapor absorption refrigeration system.	6	L2	CO2
	b.	Name the various parts of a vapor compression refrigerator and briefly explain with a flow diagram their functions.	10	L2	CO2
		Module – 4			
Q.7	a.	Mention different types of gears and explain with neat sketch.	10	L2	CO3
	b.	Derive an expression for length of an open belt drive.	10	L2	CO3
		OR			
Q.8	a.	Distinguish amongst welding, soldering and brazing.	10	L2	CO3
	b.	With neat sketch, explain the working of MIG welding.	10	L2	CO3
		Module – 5			
Q.9	a.	Explain with neat sketch different components of electric vehicle.	10	L2	CO3
	b.	Write the advantages and disadvantages of hybrid vehicle.	10	L2	CO3
		OR			
Q.10	a.	With neat sketch differentiate open and closed loop mechatronics system.	10	L2	CO3
	b.	Write the applications of robots in industry.	10	L2	CO3

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