CBCS SCHEME

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BEMEM103/203

First/Second Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
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 Steam table is permitted.

		Module – 1	M	L	C
Q.1	a.	Briefly explain role of Mechanical Engineering in Industries and Society.	6	L2	CO1
	b.	Enumerate the benefits of super heated steam over wet steam.	4	L2	CO1
	c.	Explain the working principle of Hydel power plant with sketch.	10	L2	CO1
		OR			
Q.2	a.	A steam at 10 bar and dryness 0.98 receives 140 kJ/kg at the same pressure. What is the final state of the steam?	10	L3	CO4
	b.	Explain the working principle of Tidal power plant with sketch.	10	L2	CO1
		Module – 2			
Q.3	a.	Explain the working principle of Lathe. With sketch, explain the Facing and Knurling operation.	10	L2	CO2
	b.	Explain components of CNC machine with block diagram.	10	L2	CO2
		OR			
Q.4	a.	List Milling Operations. Explain any two with sketch.	8	L2	CO2
	b.	With neat sketch, explain Reaming and Counter sinking operation in Drilling machine.	8	L2	CO2
	c.	What is 3D printing and list different 3D printing process?	4	L1	CO2
		Module – 3			
Q.5	a.	Explain the working of 4 – stroke petrol engine with PV diagram.	10	L2	CO2
	b.	Explain the applications of air conditioner.	10	L2	CO2
		OR			
Q.6	a.	The following are the observations were obtained during a trial on a 4 – stroke diesel engine: Data : Cylinder diameter = 25 cm ; Stroke of the piston = 40 cm Crank shaft speed = 250 rpm ; Brake load = 70 kg Brake drum diameter = 2 m ; Mean effective pressure = 6 bar Diesel oil consumption = 0.1 m^3/min ; Specific gravity of diesel = 0.78 Calorific value of diesel = 43900 kJ/kg. Determine BP , IP , Mechanical efficiency , Brake thermal efficiency , Indicated thermal efficiency.	10	L3	CO4

	b.	Explain the working principle of VCR refrigeration system.	10	L2	CO2
		Module – 4			
Q.7	a.	Explain Speed ratio expression of simple gear train and compound gear train with suitable sketch.	10	L2	CO3
	b.	Explain the working principle of electric arc welding process with sketch.	10	L2	CO3
		OR			
Q.8	a.	Derive an expression for length of belt in open belt drive system.	10	L3	CO3
	b.	Differentiate between Soldering , Brazing and Welding process.	10	L3	CO3
		Module – 5			
Q.9	a.	Briefly explain the components of Electric Vehicle with suitable sketch.	10	L2	CO3
	b.	Explain the application of the Robots.	10	L2	CO3
		OR			
Q.10	a.	Discuss the advantages and disadvantages of Hybrid vehicles.	10	L2	CO3
	b.	With sketch, explain Robot anatomy and Joints.	10	L2	CO3

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