U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February / March 2025 Semester End Main Examinations

Programme: B.E. **Semester: I / II**

Branch: Common to all Branches **Duration: 3 hrs.**

Course Code: 21ME1ESEME / 21ME2ESEME **Max Marks: 100**

Course: Elements of Mechanical Engineering

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	With a neat sketch, explain the working of wind power plant.	CO2	PO1	**10**
	b)	With a neat sketch, explain the working of Pelton turbine.	CO2	PO1	**10**
		OR			
2	a)	With a neat sketch, explain the working of hydel power plant.	CO2	PO1	**10**
	b)	With a neat sketch, explain the working of Francis turbine.	CO2	PO1	**10**
		UNIT - II			
3	a)	Compare between welding, brazing and soldering.	CO1	PO1	**10**
	b)	With a neat sketch, explain the brazing process.	CO1	PO1	**10**
		OR			
4	a)	With a neat sketch, explain the working of arc welding.	CO2	PO1	**10**
	b)	Differentiate between MIG & TIG welding.	CO1	PO1	**10**
		UNIT - III			
5	a)	A 4-stroke diesel engine has a piston diameter of 250 mm and stroke 400 mm. The mean effective pressure is 4 Bar and the crank speed is 500 rpm. The diameter of the brake drum is 1000 mm and the effective brake load is 400 N. Find Indicated power, Brake power, Frictional power, and Mechanical efficiency.	CO3	PO2	**10**
	b)	Differentiate between Vapour compression refrigeration system and Vapour absorption refrigeration system.	CO1	PO1	**10**
		OR			

	6	a)	The following observations were recorded during a test on a 4-stroke IC engine Bore = 25 cm; Stroke = 40 cm; Crank speed = 250 rpm; Net load on brake drum = 70 kg; Diameter of brake drum = 2 m; Indicated MEP = 6 Bar; Determine: BP, IP, FP, Mechanical Efficiency	*CO3*	*PO2*	**10**
		b)	With a neat block diagram, explain hybrid vehicles.	*CO1*	*PO1*	**10**
			UNIT - IV			
	7	a)	With a neat sketch explain all the robotics configuration.	*CO2*	*PO1*	**10**
		b)	A simple gear train is made up of four gears A, B, C & D having 20, 40, 60 & 70 teeth respectively. If gear A is the main driver rotating at 500 rpm clockwise. Calculate the speeds of intermediate gears, speed and direction of the last follower, train value.	*CO3*	*PO2*	**10**
			OR			
	8	a)	Differentiate between flat belt drive and v-belt drive.	*CO2*	*PO1*	**10**
		b)	A shaft running at 100 rpm is to drive a parallel shaft at 150 rpm. The pulley on the driving shaft is 35 cm in diameter. Find the diameter of the driven pulley. Calculate the linear velocity of the belt and also the velocity ratio.	*CO3*	*PO2*	**10**
			UNIT - V			
	9	a)	With a neat sketch, explain turning and facing operation of the lathe machine.	*CO1*	*PO1*	**10**
		b)	With a neat sketch, explain the taper turning by tailstock offset method.	*CO1*	*PO1*	**10**
			OR			
	10	a)	Differentiate between up-milling and down milling operations.	*CO1*	*PO1*	**10**
		b)	With a neat sketch, explain the taper turning by swiveling the compound rest method.	*CO1*	*PO1*	**10**

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