U.S.N.										

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

Autonomous Institute Affiliated to VTU

December 2023 Supplementary Examinations

Programme: B.E. **Semester: I / II**
Branch: Common to all Branches **Duration: 3 hrs.**
Course Code: 22ME1ESIME / 22ME2ESIME **Max Marks: 100**
Course: Introduction to 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)		Explain the working of hydroelectric power plant with a neat sketch	*CO1*	*PO 1*	**08**
	b)		Differentiate between renewable and nonrenewable energy sources with examples	*CO2*	*PO1*	**06**
	c)		With a neat sketch explain the construction and working of solar water heater used for domestic purpose	*CO1*	*PO1*	**06**
			UNIT - II			
2	a)		Explain any three taper turning methods with illustration	*CO1*	*PO1*	**09**
	b)		With a neat sketch explain drilling, boring and reaming operations performed in drilling with a neat sketch	*CO1*	*PO1*	**06**
	c)		List out advantages and limitations of CNC over traditional machines	*CO1 CO2*	*PO1*	**05**
			OR			
3	a)		Explain the working of CNC with a block diagram	*CO1 CO2*	*PO1*	**08**
	b)		What are the steps involved in Additive manufacturing, explain with a flow diagram.	*CO2*	*PO1*	**08**
	c)		Elaborate slot milling with neat sketches	*CO1*	*PO1*	**04**
			UNIT - III			
4	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; Fuel consumed = 0.1 m^3/min; Specific Gravity of fuel = 0.78; Calorific Value of the fuel = 43900 kJ/kg. Determine: BP, IP, FP, Mechanical Efficiency.	*CO3*	*PO1*	**08**

		b)	Explain working of 4- stroke petrol engine with a PV diagram	*CO2*	*PO1*	**06**
		c)	With a neat labeled sketch explain the working of hybrid vehicle	*CO2*	*PO1*	**06**
			OR			
	5	a)	A six cylinder 4-stroke IC engine develops 50 kW of indicated power at MEP of 700 kPa. The bore and stroke length are 70 mm and 100 mm respectively. If the engine speed is 3700 rpm, find the average misfires per unit time	*CO3*	*PO1*	**10**
		b)	A 4-stroke diesel engine develops a power of 5 kW and it operates at an mechanical efficiency 57%. Estimate the Indicated power.	*CO3*	*PO1*	**04**
		c)	Explain the battery-operated electric vehicle with a neat sketch	*CO3*	*PO1*	**06**
			UNIT-IV			
	6	a)	Describe the arc welding process with a neat sketch.	*CO2*	*PO1*	**08**
		b)	Differentiate between soldering and brazing.	*CO2*	*PO1*	**06**
		c)	Explain about shape memory alloys, semiconductors and piezo electric materials.	*CO1* *CO2*	*PO1*	**06**
			UNIT - V			
	7	a)	Explain the concept of open loop and closed loop system with a block diagram	*CO1*	*PO1*	**08**
		b)	Describe the anatomy of a robot with a neat sketch	*CO1*	*PO1*	**06**
		c)	What is automation, explain flexible automation with a block diagram	*CO1*	*PO1*	**06**

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