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

Autonomous Institute Affiliated to VTU

September 2024 Supplementary Examinations

Programme: B.E.   **Semester: II**
Branch: Common to all Branches   **Duration: 3 hrs.**
Course Code: 23ME2ESEME   **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.

			UNIT - I	CO	PO	Marks
1	a)		Sketch and explain construction and working of parabolic concentrating solar collector and mention its advantages.	CO3	PO1	**06**
	b)		Compare between renewable and non-renewable sources of energy with examples.	CO3	PO1	**04**
	c)		With the help of temperature-enthalpy diagram explain the formation of steam at constant pressure.	CO3	PO1	**10**
			UNIT - II			
2	a)		List the different modes of heat transfer and define the following cooling techniques with an example: (i) Active cooling, (ii) Passive cooling and (iii) Hybrid cooling.	CO2	PO2	**10**
	b)		Classify hydraulic turbine. With the help of a neat sketch explain the working principle of Pelton Wheel.	CO2	PO2	**10**
			OR			
3	a)		Explain the principle of arc welding with a neat sketch.	CO1	PO1	**06**
	b)		Write a short note on modes of heat transfer.	CO1	PO2	**06**
	c)		With a neat diagram, explain the working principle of single stage centrifugal pump.	CO1	PO1	**08**
			UNIT - III			
4	a)		Explain the 'Hybrid Electric Vehicle' with its block diagram.	CO1	PO2	**06**
	b)		With the help of sketches explain the working of a four stroke petrol engine.	CO2	PO2	**08**
	c)		Explain the working of a domestic refrigeration system with a neat sketch.	CO2	PO1	**06**
			OR			
5	a)		What are the advantages and disadvantages of a hybrid car over IC Engine car?	CO4	PO2	**06**

				CO	PO	
		b)	With the help of sketches explain the working of a four stroke Diesel engine.	*CO4*	*PO1*	**08**
		c)	With a block diagram explain the construction and working of Vapor absorption refrigeration system.	*CO4*	*PO1*	**06**
			UNIT - IV			
	6	a)	A simple gear train is made up of four gears A, B, C and D having 20, 40, 60 and 70 teeth respectively. If gear A is the main driver rotating at 500 rpm clockwise. Show the gear train arrangement and calculate the following:　(i) Velocity ratio, (ii) Speeds of the intermediate gears, and (iii) Speed and direction of the last follower.	*CO4*	*PO2*	**06**
		b)	Explain Cartesian and Cylindrical robot configuration with the appropriate sketches.	*CO3*	*PO1*	**08**
		c)	Briefly discuss the general and industrial applications of robots.	*CO3*	*PO2*	**06**
			UNIT - V			
	7	a)	Explain the following operations with help of neat sketches: (i) Turning and (ii) Knurling.	*CO4*	*PO1*	**08**
		b)	With help of block diagram explain the components of CNC Machine.	*CO3*	*PO1*	**06**
		c)	Define mechatronic systems and explain closed loop control systems with neat sketch and an example.	*CO2*	*PO2*	**06**

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