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

Autonomous Institute Affiliated to VTU

December / January 2024 Supplementary 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 FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

MODULE - 1

1.	a)	Explain the formation of steam with neat *T-H* diagram.	**06**
	b)	With a neat sketch explain the construction and working principle of wind power plant.	**07**
	c)	With a neat sketch explain Pelton wheel turbine.	**07**

OR

2.	a)	Briefly explain any six thermodynamic properties of the steam.	**06**
	b)	With a neat sketch explain the construction and working of Flat-plate solar collector.	**07**
	c)	With a neat sketch explain Francis turbine.	**07**

MODULE - 2

3.	a)	What are shape memory alloys? Explain the working principle with a neat sketch.	**07**
	b)	With a neat sketch explain electric arc welding.	**07**
	c)	Explain the modes of heat transfer with its governing equations.	**06**

OR

4.	a)	With a neat sketch classify metal matrix composites.	**06**
	b)	Compare Welding and Brazing processes.	**07**
	c)	Explain the heat transfer in automobile radiators with the help of a simple sketch.	**07**

MODULE - 3

5.	a)	With a neat sketch explain the working of 4-stroke diesel engine.	**10**
	b)	With neat sketch explain the working of Vapor Absorption Refrigeration system.	**10**

OR

6.	a)	With a neat sketch explain the working of 4-stroke petrol engine.	**10**
	b)	With neat sketch explain the working of Vapor Compression Refrigeration system.	**10**

MODULE - 4

7.	a)	With a neat sketch differentiate between open belt and cross belt drive.	**06**
	b)	Illustrate common robot configurations.	**08**
	c)	A simple gear train consists of three gears. The number of teeth on driving gear is 60 & idler gear is 40 and on the driven gear is 80. Find the velocity ratio if driving gear rotates at 1200 rpm, also calculate the speed of driven gear.	**06**

OR

8.	a)	With neat sketch differentiate between Simple and Compound gear train.	**06**
	b)	Explain the robot anatomy with a neat sketch.	**08**
	c)	The velocity ratio of a gear drive is 2. The driving wheel has 16 teeth & turns at 120 rpm. Find rpm & Number of teethes on driven wheel.	**06**

MODULE - 5

9.	a)	Explain up-milling and down-milling operations with neat sketches.	**08**
	b)	Explain with a block diagram parts of CNC machine and list its advantages & disadvantages.	**12**

OR

10	a)	Explain the three taper turning operations with the neat sketches.	**10**
	b)	With block diagrams and examples explain open and closed loop control systems.	**10**

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