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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

First Semester, B.E. - Semester End Examination; May - 2022

Elements of Mechanical Engineering

(Common to All Branches)

Time: 3 hrs *Max. Marks: 100*

Course Outcomes

The Students will be able to:

CO1: Identify the basic concept and fundamentals of mechanical engineering and understanding of technical and operational features.

CO2: Describe the working principle of energy sources, energy conversion and power transmission systems in terms of societal and environmental aspects.

CO3: Understand and Explain the conventional and non-conventional methods of manufacturing process.

CO4: Identify various automation of manufacturing process encountered in engineering practice.

Note: *I) **PART - A** is compulsory. **Two** marks for each question.*

*II) **PART - B**: Answer any **Two** sub questions (from a, b, c) for a Maximum of **18 marks** from each unit.*

Q. No.		Questions	Marks	BLs	COs	POs
		I : PART - A	**10**			
I	a.	List any four non-conventional energy sources.	2	L1	CO1	PO1
	b.	Define cranking process.	2	L1	CO2	PO1
	c.	Define Ton of refrigeration.	2	L1	CO3	PO1
	d.	List any four lathe turning operations.	2	L1	CO4	PO1
	e.	Define additive manufacturing.	2	L1	CO5	PO1
		II : PART - B	**90**			
		UNIT - I	**18**			
1	a.	Briefly describe the emerging trends of mechanical engineering in manufacturing and energy sector.	9	L2	CO1	PO1
	b.	Elucidate solar energy harnessing using solar flat plate collector.	9	L3	CO1	PO1
	c.	5 kg of wet steam of dryness fraction 0.8, passes from a boiler to a super heater the temperature increases to 350°C. Determine the amount of heat supplied in the super heater. The specific heat of super heated steam C_{ps} = 2.25 kJ/kgK.	9	L3	CO1	PO1
		UNIT - II	**18**			
2	a.	Describe the working principle of pelton wheel with a neat sketch.	9	L2	CO2	PO1
	b.	Differentiate impulse steam turbine and reaction steam turbine.	9	L2	CO2	PO1
	c.	Explain the working of a four stroke SI engine with the help of neat sketch and draw the PV diagram.	9	L3	CO2	PO1
		UNIT - III	**18**			
3	a.	Illustrate the construction and working principle of vapour compression refrigerator.	9	L3	CO3	PO1

Contd… 2

b.	Briefly explain the following terms: i) Slip ii) Creep iii) Idler pulley	9	L2	CO3	PO1
c.	Enumerate the desirable properties of a good refrigerant.	9	L2	CO3	PO1
	UNIT - IV	**18**			
4 a.	Distinguish between hot working and cold working process (any five).	9	L2	CO4	PO1
b.	Differentiate between soldering and brazing process (any five).	9	L2	CO4	PO1
c.	Briefly describe the following operations: i) Reaming ii) Boring	9	L2	CO4	PO1
	UNIT - V	**18**			
5 a.	Explain the working principle of WJM process.	9	L2	CO5	PO1
b.	Describe the basic elements of CNC.	9	L2	CO5	PO1
c.	Explain the different types of Automation.	9	L3	CO5	PO1

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