



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

(An Autonomous Institution affiliated to VTU, Belagavi)

Second Semester, B.E. - Semester End Examination; October - 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			
1 a.	Define hydel energy.	2	L1	CO1	PO1
b.	List the parts of IC engines.	2	L2	CO2	PO1
c.	Define COP.	2	L1	CO3	PO1
d.	List the Lathe operations.	2	L1	CO4	PO1
e.	Define automation.	2	L1	CO5	PO1
II : PART - B		90			
UNIT - I		18			
2 a.	Explain the working principle of wind power plant.	9	L2	CO1	PO1
b.	Briefly explain the following :				
	i) Dryness fraction				
	ii) Enthalpy of steam	9	L2	CO1	PO1
	iii) Machine				
	iv) Machine tools				
c.	Calculate the enthalpy for steam at 30 bar;				
	i) When it is 0.75 dry				
	ii) When it is super heated to 400°C	9	L2	CO1	PO1
	Take for $P = 30$ bar, $T_s = 233.84^\circ\text{C}$, $C_p = 2.3$ kJ/kg,				
	$h_f = 1008.4$ kJ/kg, $h_g = 2802.3$ kJ/kg				
UNIT - II		18			
3 a.	Explain open cycle gas turbine.	9	L3	CO2	PO1
b.	Explain with a neat sketch, Pelton wheel turbine.	9	L3	CO2	PO1
c.	Differentiate between petrol and diesel engines	9	L3	CO2	PO1

UNIT - III		18
4 a.	List the desirable properties of good refrigerants.	9 L2 CO3 PO1
b.	Explain the working of vapor compression refrigeration system with a neat sketch.	9 L2 CO3 PO1
c.	Write short notes on :	
i)	Open belt drive system	9 L2 CO3 PO1
ii)	Cross belt drive system	
UNIT - IV		18
5 a.	With a neat sketch, explain electric arc welding process.	9 L2 CO4 PO1
b.	Explain any three lathe operations.	9 L2 CO4 PO1
c.	Explain any three drilling operations.	9 L2 CO4 PO1
UNIT - V		18
6 a.	Explain any two robot configurations.	9 L2 CO5 PO1
b.	Explain types of automation.	9 L2 CO5 PO1
c.	List the advantages and disadvantages of CNC machine.	9 L2 CO5 PO1

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