23MET14D

USN										

FIRST Semester B. E. Degree Semester End Examination (SEE), Jan/ Feb 2024

Principles of Mechanical Engineering

(Model Question Paper - 1)

[Time: 3 Hours] **[Maximum Marks: 100]**

Instructions to students:

i. **Answer FIVE FULL Questions as per choice.**
ii. **Use BLACK ball point pen for text, figure, table, etc.**
iii. **Assume missing data, if any.**

		Module-1	Marks	CO	RBT Level
1.	**a)**	Discuss the role of Mechanical Engineer in the industry and Society	**[10 Marks]**	**CO1**	**L2**
	b)	Briefly explain the emerging trends of mechanical Engineering in Manufacturing and Energy Sector	**[10 Marks]**	**CO1**	**L2**
		OR			
2.	**a)**	Explain briefly with a neat diagram the working of a Hydro Power Plant	**[08 Marks]**	**CO1**	**L1, L2**
	b)	What is solar Energy? Apply the Solar energy conversion technic into electrical energy in a solar cell	**[08 Marks]**	**CO1**	**L1, L2**
	c)	Write short note on Tidal power plant	**[04 Marks]**	**CO1**	**L2**
		Module-2			
3.	**a)**	Explain the four major parts of the lathe machine	**[07 Marks]**	**CO2**	**L2**
	b)	Briefly explain the following operations performed on lathe with sketch a) Plain turning b) Thread cutting c) Knurling	**[09 Marks]**	**CO2**	**L1, L2**
	c)	List the application of Lathe machines	**[04 Marks]**	**CO2**	**L2**
		OR			
4.	**a)**	List the main components of the CNC machine with a block diagram	**[04 Marks]**	**CO2**	**L1**
	b)	Explain the up milling and down Milling process with neat sketch	**[07 Marks]**	**CO2**	**L1, L2**
	c)	Briefly explain the following operations performed on Drilling machine, with sketch a) Reaming operation b) Boring operation c) Tapping operation	**[09 Marks]**	**CO2**	**L2, L3**
		Module-3			
5.	**a)**	With a neat sketch explain the working principle of four stroke petrol engine	**[10 Marks]**	**CO3**	**L1, L2**
	b)	Reference to the following observations during a trial on a 4-stroke diesel engine: Crankshaft speed =260 rpm, Cylinder diameter =24cm, Stroke of piston =1.6 times the bore, Brake load = 65 kg, Brake drum diameter =2m, Mean effective Pressure =5 bar, Diesel consumption =0.1 litre/min, Specific gravity of diesel = 0.78, Calorific value of diesel = 43900 KJ/Kg, Determine (i) BP (ii) IP (iii) FP (iv) Mechanical efficiency (v) I-thermal efficiency (vi) B-thermal efficiency	**[10 Marks]**	**CO3**	**L3**
		OR			
6.	**a)**	Explain the main components of Electric vehicle with diagram	**[8 Marks]**	**CO3**	**L1**
	b)	List out the advantages and disadvantages of Electric vehicle	**[06 Marks]**	**CO3**	**L1**

	c)	Differentiate between Hybrid and Electric vehicle	**[06 Marks]**	**CO3**	**L1**

Module-4

7.	**a)**	Classify the gear trains and explain any two types with sketch	**[08 Marks]**	**CO4**	**L2**
	b)	A simple gear train consists of four gear having 30,40,50,60 teeth respectively. Determine the speed and direction of last gear if the first gear makes 60 rpm in clockwise direction.	**[06 Marks]**	**CO4**	**L3**
	c)	Mention the advantages and disadvantages of V-belts	**[06 Marks]**	**CO4**	**L1**

OR

8.	**a)**	Define Robot? List and classify based on the physical configuration	**[07 Marks]**	**CO4**	**L2**
	b)	Differentiate between open loop and close loop systems	**[08 Marks]**	**CO4**	**L2**
	c)	List out the applications of Robot in material handling	**[05 Marks]**	**CO4**	**L1**

Module-5

9.	**a)**	What is a composite material? State advantages and applications of composite materials	**[08 Marks]**	**CO5**	**L1**
	b)	Write short note on (i) shape memory materials (b) fiber reinforcement composites	**[08 Marks]**	**CO5**	**L1**
	c)	List out the applications of Metal matrix composites	**[04 Marks]**	**CO5**	**L1**

OR

10.	**a)**	Distinguish between soldering, and brazing	**[05 Marks]**	**CO5**	**L2**
	b)	Explain the arc welding process with neat sketch	**[06 Marks]**	**CO5**	**L2**
	c)	Explain the oxy-acetylene welding process using 3 flames with neat sketch	**[09 Marks]**	**CO5**	**L2**

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