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<b>FIRST Semester B. E. Degree Semester End Examination (SEE), Jan/ Feb 2024</b>										
<b>Mechanical Engineering Science</b>										
<b>(Model Question Paper - 1)</b>										
<b>[Time: 3 Hours]</b>								<b>[Maximum Marks: 100]</b>		
<b><u>Instructions to students:</u></b>										
<p><b>i. Answer FIVE FULL Questions as per choice.</b>  <b>ii. Use BLACK ball point pen for text, figure, table, etc.</b>  <b>iii. assume missing data, if any.</b></p>										
<b>Module-1</b>							<b>Marks</b>	<b>CO</b>	<b>RBT Level</b>	
1.	a)	Write a note on role of mechanical engineering in industries and society.					[06 Marks]	CO1	L1	
	b)	With neat sketch explain hydro power plant.					[07 Marks]	CO1	L2	
	c)	With neat sketch explain thermal power plant.					[07 Marks]	CO1	L2	
<b>OR</b>										
2.	a)	Write a note on Trends and technologies in different sectors.					[06 Marks]	CO1	L1	
	b)	With neat sketch explain tidal power plant.					[07 Marks]	CO1	L2	
	c)	With neat sketch explain wind power plant.					[07 Marks]	CO1	L2	
<b>Module-2</b>										
3.	a)	With neat sketch explain taper turning by swiveling compound rest.					[10 Marks]	CO2	L2	
	b)	With neat sketch explain facing and knurling operation.					[10 Marks]	CO2	L2	
<b>OR</b>										
4.	a)	With neat sketch explain reaming and boring operation.					[10 Marks]	CO2	L2	
	b)	With neat sketch explain end milling and slot milling.					[10 Marks]	CO2	L2	
<b>Module-3</b>										
5.	a)	With neat sketch explain working principle of 4-stroke petrol engine.					[10 Marks]	CO3	L2	
	b)	A single cylinder 4 stroke engine has bore =180mm, stroke=200mm and rated speed=300rpm. Torque on the brake drum = 200N-m, Mean effective pressure = 6 bar. It consumes 4kg of fuel per hour. The calorific value of fuel=42,000 kJ/kg. Determine BP, IP, FP, break thermal efficiency and mechanical efficiency.					[10 Marks]	CO3	L3	
<b>OR</b>										
6.	a)	With neat sketch explain components and working principle of electrical vehicles					[08 Marks]	CO3	L2	

- b) Write note on emission standards. [06 Marks] CO3 L1  
 c) List advantage and disadvantages of hybrid vehicle. [06 Marks] CO3 L1

**Module-4**

7. a) Derive the expression for the length of open belt drive. [10 Marks] CO4 L2  
 b) Derive the expression for velocity ratio for simple and compound gear train. [07 Marks] CO4 L2  
 c) List the advantages of V- belt drive. [03 Marks] CO4 L1

**OR**

8. a) With neat sketch explain Robot anatomy and joints. [10 Marks] CO4 L2  
 b) Explain the applications of Robots. [10 Marks] CO4 L1

**Module-5**

9. a) Differentiate soldering, brazing and welding processes. [06 Marks] CO5 L1  
 b) Write a note on shape memory alloys, semiconductors and super insulator. [06 Marks] CO5 L1  
 c) With neat sketch explain TIG welding process. [08 Marks] CO5 L2

**OR**

10. a) With neat sketch explain MIG welding process. [10 Marks] CO5 L2  
 b) With neat sketch explain types of flames in oxy-acetylene welding [10 Marks] CO5 L2

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