Model Question Paper-I/II with effect from 2021 (CBCS Scheme)

USN | | | | | | | | | |

First Semester B.E Degree Examination
Elements of Mechanical Engineering 21EME15/25

TIME: 03 Hours **Max. Marks: 100**

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.
02. Use of Steam tables are permitted to solve numerical on steam.

		Module -1	**Marks**
Q. 1	a	Discuss the role of Mechanical Engineer in the industry and Society	10
	b	With the help of a T-h diagram, Explain the various stages in the formation of Steam	10
		OR	
Q. 2	a	Enumerate the method of extracting energy from Wind with a neat sketch	10
	b	5 kg of wet steam of dryness fraction 0.8, passes from a boiler to a superheater at a constant pressure of 1MPa absolute. In the superheater the temperature increases to 350°C. Determine the amount of heat supplied in the superheater. The specific heat of super-heated steam Cps = 2.25 KJ/KgK	10
		Module-2	
Q. 3	a	Classify and explain different types of Smart Materials	8
	b	Differentiate between the Brazing and Soldering Process	4
	c	What are the three modes of Heat transfer? Explain the process of Heat transfer in Automobile radiator	8
		OR	
Q. 4	a	Discuss how gas welding is different from brazing process. List the applications of gas Welding	10
	b	With a neat sketch explain the principle and working of MIG welding. List its applications	10
		Module-3	
Q. 5	a	With a suitable sketch explain the different parts of an I.C Engine	10
	b	Discuss the need of Electric and Hybrid vehicles. List their advantages and limitations	10
		OR	
Q. 6	a	Describe the working principle of Vapour Compression Refrigeration	10
	b	List and explain the industrial application of Refrigeration	10
		Module-4	
Q. 7	a	A pinion with 120mm pitch circle diameter meshes with a gear of 400mm pitch circle diameter. The number of teeth on the pinion is 18 and it rotates at 1440rpm. Determine: i) Gear Ratio ii) number of teeth on gear iii) Speed of the gear	6
	b	What are the different types of belt drives? With a neat sketch explain any two of them	8
	c	With a suitable example explain the application of linear motion mechanism	6
		OR	
Q. 8	a	With suitable sketches explain the different types of joints used in robots	8
	b	Explain the application of robot in assembly and inspections	8
	c	List the advantages of gears over belt drives	4
		Module-5	
Q. 9	a	What is taper turning? Explain the taper turning operation by swiveling the compound rest method.	10
	b	What is Smart Manufacturing? Discuss the role of IoT in smart manufacturing	10

		OR	
Q.10	a	Describe the Construction and working of upright Drilling Machine	10
	b	With Suitable Example explain the concept of open and Closed loop System	10

Table showing the Bloom's Taxonomy Level, Course Outcome and Program Outcome				
Question		**Bloom's Taxonomy Level attached**	**Course Outcome**	**Program Outcome**
Q1	**a**	**L2**	**CO2**	**PO1, PO12**
	b	**L2**	**CO1**	**PO1**
Q2	**a**	**L2**	**CO2**	**PO1**
	b	**L3**	**CO2**	**PO2**
Q3	**a**	**L2**	**CO1**	**PO1**
	b	**L3**	**CO2**	**PO1**
	c	**L2**	**CO2**	**PO1**
Q4	**a**	**L3**	**CO2**	**PO1**
	b	**L2**	**CO1**	**PO1**
Q5	**a**	**L2**	**CO1**	**PO1**
	b	**L2**	**CO2**	**PO5**
Q6	**a**	**L2**	**CO1**	**PO1**
	b	**L2**	**CO2**	**PO1**
Q7	**a**	**L2**	**CO2**	**PO2**
	b	**L2**	**CO1**	**PO1**
	c	**L2**	**CO3**	**PO1**
Q8	**a**	**L2**	**CO1**	**PO1, PO12**
	b	**L2**	**CO2**	**PO1, PO12**
	c	**L2**	**CO2**	**PO1**
Q9	**a**	**L2**	**CO1**	**PO1**
	b	**L3**	**CO2**	**PO5**
Q10	**a**	**L2**	**CO1**	**PO1**
	b	**L3**	**CO1**	**PO5**

Bloom's Taxonomy Levels	**Lower order thinking skills**		
	Remembering (knowledge): L_1	Understanding (Comprehension): L_2	Applying (Application): L_3
	Higher order thinking skills		
	Analyzing (Analysis): L_4	Evaluating (Evaluation): L_5	Creating (Synthesis): L_6