

USN						BESCKD104/BESCK104D

## First Semester B.E./B.Tech. Degree Supplementary Examination, June/July 2024

## **Introduction to Mechanical Engineering**

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. VTU Formula Hand Book is permitted.

3. M: Marks, L: Bloom's level, C: Course outcomes.

		Module – 1	M	L	С					
Q.1	a.	Highlight the key role of Mechanical Engineering in Industries and society.	10	L1	CO1					
Ų.1	а.	Triginight the key fole of Mechanical Engineering in fluctures and society.	10	1/1	COI					
	b.	Explain the emerging trends and technologies in the following sectors:	10	L2	CO1					
		i) Energy ii) Manufacturing iii) Automotive iv) Aerospace								
		v) Marine.								
	1	OR		1	1					
Q.2	a.	Sketch and explain Hydel power plant.	10	L2	CO1					
	b.	Write short notes on Global warming and Ozone depletion.	10	L2	CO1					
	1	Module – 2								
Q.3	a.	Explain the following lathe operations along with neat sketch:	10	L2	CO2					
		i) Turning ii) Knurling iii) Facing.								
		2 0 7								
	b.	Sketch and explain the following operations:	10	<b>L2</b>	CO2					
		i) Drilling ii) Boring iii) Reaming.								
	1	OR		1						
Q.4	a.	Write a short notes on:	10	L2	CO2					
		i) CNC Machine ii) 3D printing.								
	b.	Explain the advantages and applications of CNC machine.	10	L2	CO2					
0.5	1	Module – 3	10	T 0	602					
Q.5	a.	Sketch and explain the working principle of 4 stroke petrol engine.	10	L2	CO <sub>3</sub>					
	C		10	τ 2	002					
	b.	Explain the following:	10	L2	CO <sub>3</sub>					
		i) Components of IC Engine [Any five]								
		ii) Applications of IC Engines.								
		OP								
0.6		a. Highlight the advantages and limitations of electric vehicles and hybrid								
<b>Q.6</b>	a.	vehicles.	10	LL	CO <sub>3</sub>					
		venicles.								
	b.	Sketch the layout and explain the key components of electric and hybrid	10	L2	CO3					
	υ.	vehicles.	10	LL	COS					
		vonicies.								
	1	<b>O</b> '	1	<u> </u>						
		1 of 2								
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~ <del>-</del>		Module – 4		
Q.7	a.	Explain the differences between ferrous and non-ferrous metals along with examples and applications.	10	Ι
	b.	Write short notes on polymers and shape memory alloys.	10	Ι
0.0		OR OR	10	_
Q.8	a. b.	What is welding? Explain electric arc welding with a neat sketch.  Explain electric arc welding with a neat sketch.	10	I
	υ.	Explain clearly the differences between welding, soldering and brazing.	10	1
	1	Module – 5		1
Q.9	a.	<ul><li>Sketch and explain the following configuration of Robots:</li><li>i) Cartesian co-ordinate configuration.</li><li>ii) Polar cylindrical co-ordinate configuration.</li></ul>	10	I
	b.	Define the term Automation. Explain briefly the following automation considering examples:	10	Ι
		i) Flexible ii) Fixed iii) Programmable.		
		OR	<u> </u>	1
Q.10	a.	Define Robot. List the advantages and disadvantages of Robotics.	10	I
	b.	Explain the following:	10	Ι
		<ul><li>i) Smart manufacturing and Industrial IOT.</li><li>ii) Open loop and closed loop systems.</li></ul>		
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