Basavarajeswari Group of Institutions

2022 SCHEME

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

USN | | | | | | | | | | |

Course Code | 2 | 2 | E | S | C | 2 | 4 | 4 |

Second Semester B.E.Degree Summer Semester Examinations, September/October 2025

INTRODUCTION TO MECHANICAL ENGINEERING

Duration: 3 hrs **Max. Marks: 100**

Note: 1. Answer any* FIVE *full questions, choosing* ONE *full question from each module.
2. Missing data, if any, may be suitably assumed.

Q. No		*Question*	*Marks*	*(RBTL:CO:PI)*
		MODULE – 1		
1.	**a.**	Who is mechanical engineer? Describe how mechanical engineering contributes in the nation development.	**10**	**(2:1:1.6.1)**
	b.	Explain briefly the emerging trends of mechanical engineering in different sectors.	**10**	**(2:1:1.6.1)**
		(OR)		
2.	**a.**	Write a note on renewable and non-renewable energy resources.	**05**	**(2:1:1.6.1)**
	b.	Briefly explain the working principle of hydroelectric power plant with a neat sketch. List the merits and demerits.	**10**	**(2:1:1.6.1)**
	c.	Enumerate how effectively solar energy can be used?	**05**	**(2:1:1.6.1)**
		MODULE – 2		
3.	**a.**	Discuss the applications of IC Engines.	**06**	**(2:2:1.6.1)**
	b.	With a schematic diagram, explain the working of four stroke cycle diesel engine.	**08**	**(2:2:1.6.1)**
	c.	Differentiate between petrol engine and Diesel engine.	**06**	**(2:2:1.6.1)**
		(OR)		
4.	**a.**	What is a hybrid electric vehicle? List the advantages and disadvantages of hybrid electric vehicles.	**10**	**(2:2:1.6.1)**
	b.	Differentiate between electric vehicles and HEVs.	**10**	**(2:2:1.6.1)**
		MODULE – 3		
5.	**a.**	Explain the following lathe operations: (i) Turning (ii) Facing (iii) Knurling (iv) Drilling	**10**	**(2:3:1.6.1)**
	b.	Explain the following milling operations: (i) Plane milling (ii) End milling (iii) Slot milling (iv) Gang milling	**10**	**(2:3:1.6.1)**
		(OR)		
6.	**a.**	With neat sketch, explain the components of CNC system.	**10**	**(2:3:1.6.1)**
	b.	List the advantages, disadvantages and applications of CNC Machines.	**10**	**(2:3:1.6.1)**
		MODULE – 4		
7.	**a.**	Give any six applications of ferrous metals and its alloys.	**06**	**(2:4:1.6.1)**
	b.	Write a short note on ceramics and Shape memory alloys.	**08**	**(2:4:1.6.1)**
	c.	Explain briefly thermoplastics and thermosetting polymers and name few thermoplastics and thermosetting polymers.	**06**	**(2:4:1.6.1)**
		(OR)		

Note: (**RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI - Performance Indicator)**

8.	**a.**	Explain with neat sketch the oxy-acetylene gas welding.	**08**	**(2:4:1.6.1)**
	b.	Compare soldering, brazing and welding.	**08**	**(2:4:1.6.1)**
	c.	Describe Electric arc welding with neat sketch.	**06**	**(2:4:1.6.1)**

MODULE – 5

9.	**a.**	Define the following: (i) Mechatronics (ii) Robot (iii) Open loop mechatronics system (iv) Closed loop mechatronics system	**04**	**(2:5:1.6.1)**
	b.	Explain the applications of robots in material handling and assembly.	**08**	**(2:5:1.6.1)**
	c.	Briefly explain cylindrical and spherical configurations of a robot with neat sketch.	**08**	**(2:5:1.6.1)**

(OR)

10.	**a.**	Explain programmable and flexible automation and give some examples for each.	**08**	**(2:5:1.6.1)**
	b.	Write a note on (i) Industrial IoT (ii) Industrial Revolution 4.0 (iii) Advantages of IoT	**12**	**(2:5:1.6.1)**

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