Basavarajeswari Group of Institutions

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

USN											Course Code	2	2	E	M	E	2	3

Second Semester B.E. Degree Examinations, Sept / Oct 2023

ELEMENTS OF MECHANICAL ENGINEERING

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

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

Q. No		*Question*	*Marks*	*(RBTL:CO: PI)*
		MODULE – 1		
1.	**a.**	Discuss briefly the role of Mechanical Engineering in an Industry.	**04**	(2 :1: 1.6.1)
	b.	Explain the emerging trends of Mechanical engineering in Manufacturing & Energy sectors.	**08**	(2 :1: 1.6.1)
	c.	With the help of a T-h diagram, explain the various stages of Steam formation.	**08**	(2 :1: 1.6.1)
		OR		
2.	**a.**	Describe with a neat sketch the generation of electrical energy from Hydel power.	**10**	(2 :1: 1.6.1)
	b.	Describe the construction & working of Wind power plant with a schematic diagram	**10**	(2:1: 1.6.1)
		MODULE – 2		
3.	**a.**	Briefly explain with neat sketch the following operations performed on a lathe: a) Plain turning b) Facing c) Knurling d) Thread cutting e) Taper turning	**10**	(2 :2: 1.6.1)
	b.	Show the following with neat sketches and discuss. a) Drilling b) Boring c) Reaming d) Counter boring e) Counter sinking	**10**	(2 :2: 1.6.1)
		OR		
4.	**a.**	Explain the working principle of up and down milling processes with a diagram.	**8**	(2 :2: 1.6.1)
	b.	Describe the various components of CNC machine with a neat diagram.	**6**	(2 :2: 1.6.1)
	c	List the advantages and applications of CNC machines.	**6**	(2 :2: 1.6.1)
		MODULE – 3		
5.	**a.**	Analyze the working of the 4 stroke Petrol engine with sketches. Plot the PV diagram.	**10**	(4 :3: 1.6.1)
	b.	The following data is collected from a 4-S single cylinder engine at full load conditions, Bore= 200mm, Stroke = 280mm, speed= 300rpm. The Indicated mean effective Pressure = 5.6 bar, Torque on the brake drum= 250N-m, Fuel consumed = 4.2 kg/hour and Calorific value = 41000 kJ/Kg. Determine i) Mechanical efficiency ii) Indicated thermal efficiency iii) Brake thermal efficiency of the engine.	**10**	(3 :3: 1.7.1)
		OR		
6.	**a.**	Describe the Principle and operation of Vapour compression Refrigeration system.	**10**	(1 :3: 1.6.1)

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

MODEL QUESTION PAPER

	b.	Describe the Principle and operation of room type air conditioning system	**10**	(3 :3: 1.6.1)

MODULE – 4

7.	**a.**	Discuss the various types of Gear drives and mention their applications.	**6**	(2 :4: 1.6.1)
	b.	Distinguish between gear and a gear train. Also, Compare Simple and compound gear train with sketches.	**8**	(3 :4: 1.6.1)
	c	Write a note on Belt Drives.	**6**	(3 :4: 1.6.1)

OR

8.	**a.**	Define the following i) Welding ii) Soldering	**4**	(1 :4: 1.6.1)
	b.	Describe the construction & working of an Arc welding process with a figure.	**8**	(2 :4: 1.6.1)
	c	With a neat sketch explain the principle and working of TIG welding.	**8**	(2 :4: 1.6.1)

MODULE – 5

9.	**a.**	Define Electric vehicles. Explain the components and working of electric vehicles.	**8**	(2 :5: 1.6.1)
	b.	Describe Hybrid vehicles with its components.	**8**	(2 :5: 1.6.1)
	c	List the advantages and limitations of electric vehicles.	**4**	(2 :5: 1.6.1)

OR

10.	**a.**	What is Mechatronics? List the differences between Open loop and Closed loop systems.	**8**	(2 :5: 1.6.1)
	b.	Based on the configuration, explain the two types of robots with sketches.	**8**	(4 :5: 1.6.1)
	c	List the applications of robots in different fields.	**4**	(2 :5: 1.6.1)

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MODEL QUESTION PAPER

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