RV COLLEGE OF ENGINEERING®

(An Autonomous Institution affiliated to VTU)

I Semester B. E. Examinations May-2023

Common to AI / BT / CS / CY / CD / EC/ EI /ET/ IS / CV/EE

FUNDAMENTALS OF MECHANICAL ENGINEERING (ELECTIVE)

Time: 03 Hours ***Maximum Marks: 100***

Instructions to candidates:

1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
2. Answer FIVE full questions from Part B. In Part B question number 2 is compulsory. Answer any one full question from 3 and 4, 5 and 6, 7 and 8 & 9 and 10.

PART-A

1	1.1	PVC is an example of _____ type of polymer.	01
	1.2	The internal diameter of engine cylinder is called _____.	01
	1.3	Piston is made of _____ material.	01
	1.4	Mention types of computer vision in manufacturing.	02
	1.5	Forge welding is the example of _____ type of welding.	01
	1.6	Carburizing flame is also called _____ flame.	01
	1.7	_____ is the type of filler material commonly used in soldering.	01
	1.8	In _____ type of automation the sequence of processing or assembly operations to be carried out is fixed by the equipment configuration.	01
	1.9	What is indicated power?	01
	1.10	1:7 to 1:11 is the compression ratio of _____ engine.	01
	1.11	What is the significance of *ROM* & *RAM* in *CNC* machine?	02
	1.12	The temperature in soldering ranges from _____ to _____.	01
	1.13	In compression ignition engine the fuel used is _____.	01
	1.14	Series hybrids may also be called as _____ type electric vehicles.	01
	1.15	What are the three phases of mechatronic system design process?	02
	1.16	In _____ type of flame, the oxygen & acetylene mixed in equal proportion.	01
	1.17	Define velocity ratio of gear.	01

PART-B

2	a	Differentiate between thermosets and thermoplasts.	05
	b	Briefly explain the characteristics of Elastomers.	03
	c	In detail, explain the applications of ceramic in various fields.	08
3	a	Explain the role of human vision in computer interaction in manufacturing.	08
	b	With the neat sketch, explain the working principle of oxy-acetylene welding.	08
		OR	
4	a	Briefly discuss the industrial applications of computer vision in manufacturing.	08
	b	With the neat sketches, explain electric arc welding process.	08

5	a	Explain the different types of robots based on configuration with neat diagram.	08
	b	Explain in detail, the merits and demerits of all the types of automation.	08
		OR	
6	a	Explain the various elements of robotic systems.	08
	b	Explain the features of different types of automation with an example of each.	08
7	a	Explain with a neat sketch, the working principles of *IC* engine in which burning of fuel takes place at constant pressure and crank shaft rotates two revolutions for every cycle.	10
	b	With a neat sketch, explain the working of series type of hybrid electric vehicle.	06
		OR	
8	a	With an example, bring out the velocity ratio and train value for compound gear train.	08
	b	Explain the concept of well to wheel analysis of electric drives.	08
9	a	With an appropriate diagram, explain the working of Engine Management System.	10
	b	Explain the inverse effect of using fossil fuels on the earth.	06
		OR	
10	a	Discuss the major causes for global warming on earth.	06
	b	Enumerate mechatronics control system using automatic camera as an example with an appropriate diagram.	10