COURSE CODE:22ES14E

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RV COLLEGE OF ENGINEERING
Autonomous Institution affiliated to VTU
I Semester B.E. April -2023 Examinations
DEPARTMENT OF MECHANICAL ENGINEERING
COURSE TITLE: FUNDAMENTALS OF MECHANICAL ENGINEERING

(2022 SCHEME)

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, and 9 and 10.

PART-A (Objective type for one or two marks)
(True & false and match the following questions are not permitted)

1	1.1	Piston rings are provided to maintain _____	20
	1.2	_____part of an engine converts rectilinear motion of piston to rotary motion of crankshaft	
	1.3	_____ type of Automation systems is used for mass production.	
	1.4	Stroke of the piston will be equal to _____ the radius of the crank.	
	1.5	What is flexible automation?	
	1.6	In hybrid electric vehicles _____ converts AC or DC electrical energy into AC energy suitable for the operation of the electric motor.	
	1.7	Geothermal energy is the example of _____ type of energy resources.	
	1.8	Polyester is the example of _____ type of polymer	
	1.9	_____ type of control systems doesn't have feedback system.	
	1.10	Define composite materials.	
	1.11	_____ is the type of filler material commonly used in soldering	
	1.12	What is regenerative braking?	
	1.13	What is significance of ROM & RAM in CNC machine	
	1.14	What is compression ratio?	
	1.15	Write any four non-conventional energy resources	
	1.15	What are three Phase of Mechatronic system design process	
	1.16	Classify the types of flames used in gas welding process?	

PART-B (Maximum subdivisions is limited to 3 in each question)

		UNIT-I	
2	a	Define Engineering materials. Give the detailed classification of materials, along with their applications	16
	b	Discuss in details physical, mechanical & electrical properties of the materials.	
		UNIT-II	
3	a	Explain the role of human vision in computer interaction in manufacturing	16
	b	How do you carry out the Electric arc welding process? Explain with neat process sketch and the safety measures while executing.	
		OR	
4	a	Explain the Differences between computer vision & artificial intelligence.	
	b	In oxy acetylene welding, explain the proportionality of each gas with respect to the type of flames and its application.	
		UNIT-III	
5	a	With the detail diagram, explain the various elements of CNC Machine.	16
	b	Discuss the applications of industrial robots in manufacturing sectors.	
		OR	
6	a	What is automation? explain the all the types of automation with an example for each.	
	b	Classify and explain the types of robots based on configurations.	
		UNIT-IV	
7	a	Explain with schematic sketches working principle of IC Engine in which burning of fuel take place at constant volume and crank shaft rotates two revolutions for every cycle.	16
	b	With a neat sketch, explain Series - parallel type of hybrid electric vehicle.	
		OR	
8	a	With an example, Bring out the Velocity ratio and train Value for Simple and Compound Gear Trains	
	b	Compare between constant Pressure and constant Volume cycle IC engines.	
		UNIT-V	
9	a	Explain with a flow chart the Phases of Mechatronics system design process.	16
	b	Differentiate between open and closed loop control system.	
		OR	
10	a	Discuss the major causes for ozone depletion	
	b	Enumerate mechatronics control system using washing machine as an example with an appropriate diagram	