RV Educational Institutions
RV College of Engineering

Autonomous Institution Affiliated to Visvesvaraya Technological University, Belagavi

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RVCE22BCD014

USN

DEPARTMENT OF MECHANICAL ENGINEERING

Date	19th Jan 2023	Maximum Marks	10+50
Course Code	22ES14E	Duration	20+90 Min
Semester	I	CIE-I	
FUNDAMENTALS OF MECHANICAL ENGINEERING			

Answer all the Questions

PART A (QUIZ)

Sl. No.	Questions	M	BT	CO
1	Define the following terms: Stoke. Compression ratio.	2	L1	3
2	[redacted] & [redacted] gears are used to transmit the motion when two shafts are parallel to each other.	2	L1	3
3	Piston rings are provided to maintain [redacted]	1	L1	3
4	[redacted] part of an engine converts rectilinear motion of piston to rotary motion of crankshaft	1	L1	3
5	Stroke of the piston will be equal to [redacted] the radius of the crank.	1	L1	3
6	Energy required to perform suction and compression strokes only during the first cycle at the time of starting is supplied by [redacted]	1	L1	3
7	In hybrid electric vehicles [redacted] converts AC or DC electrical energy into AC energy suitable for the operation of the electric motor.	1	L1	3
8	In Micro Hybrid Electric vehicles, electric Motor supplies power of [redacted]	1	L1	3

PART B (TEST)

Sl. No.	Questions	M	BT	CO
1.	Explain with schematic diagram working principle of IC engine in which burning of fuel takes place at constant pressure.	10	L2	3
2.	With a neat sketch explain Series-Parallel Hybrid electric vehicle.	10	L2	3
3	Explain with Sketches: a) Helical Gears b) Elliptical Gears c) Worm Gears	10	L3	3
4a	Classify in detail the different type of IC Engine.	5	L1	3
4b	Compare between constant Pressure and constant Volume cycle IC engines.	5	L1	3
5	With a neat sketch derive Velocity ratio and Train value for Simple and Compound Gear train.	10	L3	3

BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

Marks Distribution	Particulars	CO1	CO2	CO3	CO4	L1	L2	L3	L4	L5	L6
	Max Marks	00	00	50	00	20	10	20	00	00	00

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DEPARTMENT OF MECHANICAL ENGINEERING

Date	23rd Feb 2023	Maximum Marks	10 + 50
Course Code	22ES14E	Duration	120 Min
Semester	I	CIE-II	
FUNDAMENTALS OF MECHANICAL ENGINEERING			

NOTE: Answer all the Questions.

PART A (QUIZ)

Sl. No.	Questions	M	BT	CO
1	What is the significance of ROM & RAM in CNC machine	2	L1	4
2	List out the examples of closed loop control system	2	L1	4
3	What are three Phase of Mechatronic system design process	2	L1	4
4	_____ type of control systems doesn't have feedback system.	1	L1	4
5	_____ type of Automation systems is used for mass production.	1	L1	4
6	Geothermal energy is the example of_____ type of energy resources.	1	L1	3
7	Define Automation.	1	L1	4

PART B (TEST)

Sl. No.	Questions	M	BT	CO
1.	Discuss in detail the operations involved in the sequential control of a microprocessor-based washing machine.	10	L2	4
2.	What is automation? explain the all the types of automation with an example for each.	10	L2	4
3	With the detail diagram, explain the various elements of CNC Machine.	10	L3	4
4a	Discuss the major causes for ozone depletion.	5	L1	3
4b	Differentiate between conventional and non-conventional energy resources.	5	L1	3
5	What do you understand by the term 'Mechatronics'? With a neat diagram, show the basic elements of a Mechatronics system. Give examples of mechatronics systems.	10	L3	4

BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

Marks Distribution	Particulars	CO1	CO2	CO3	CO4	L1	L2	L3	L4	L5	L6
	Max Marks	00	00	11	49	20	20	20	00	00	00

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USN

DEPARTMENT OF MECHANICAL ENGINEERING

Date	21st March 2023	Maximum Marks	10+50
Course Code	22ES14E	Duration	120 Min
Semester	I	CIE- Improvement Test	
FUNDAMENTALS OF MECHANICAL ENGINEERING			

Answer all the Questions

PART A (QUIZ)

Sl. No.	Questions	M	BT	CO
1	Write the basic parts of robots.	2	L1	4
2	Write any 2 applications of FRP composites.	2	L1	1
3	List out the examples of thermoset type of polymers.	2	L1	1
4	Define composite materials.	1	L1	1
5	Polyester is the example of _____ type of polymer	1	L1	1
6	Concrete which contains steel rods in a matrix of cement, sand and crushed stones is a example of _____ type of composite material	1	L1	1
7	The polar configuration of the robot is also called _____ robot	1	L1	4

PART B (TEST)

Sl. No.	Questions	M	BT	CO
1.	Define Engineering materials. Give the detailed classification of materials, along with their applications	10	L2	4
2.	Discuss the industrial applications of robots in manufacturing process.	10	L2	1
3	Explain the general characteristics of polymers	10	L2	1
4a	Differentiate between thermosets and thermoplastics.	5	L2	1
4b	Explain the properties of composite materials	5	L2	1
5	Classify and explain the types of robots based on configurations.	10	L3	4

BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

Marks	Particulars	CO1	CO2	CO3	CO4	L1	L2	L3	L4	L5	L6
Distribution	Max Marks	37	00	00	23	10	40	10	00	00	00

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