RV College of Engineering®
Mysore Road, RV Vidyaniketan Post,
Bengaluru - 560059, Karnataka, India

NBA Accredited (UG - 6Years)

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Department of Mechanical Engineering

Date	MAY 2024	Maximum Marks	50
Course Code	ME113AT	Duration	90 Min
Semester	II	CIE-1	

FUNDAMENTALS OF MECHANICAL ENGINEERING

Answer all the Questions.

#	Questions	M	BT	CO
1	Explain with schematic diagram and graph working principle of IC engine in which burning of fuel takes place at constant pressure.	10	L3	C03
2 a	With a neat diagram explain elements of CNC system	5	L1	C01
2 b	Derive Velocity ratio and Train Value for Compound gear train system with 4 gears.	5	L2	C03
3	With a neat diagram, explain, a) Rectilinear Robot configuration b) Jointed arm Configuration Robot	10	L1	C01
4	Explain with Sketches: a) Miter Gears b) Elliptical Gears c) Helical gear	10	L3	C02
5	With a neat sketch explain: a) Parallel Hybrid electric vehicle b) Series-Parallel Hybrid electric vehicle.	10	L3	C03

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

Marks	Particulars	CO1	CO2	CO3	CO4	L1	L2	L3	L4	L5	L6
Distribution	Max Marks	10	10	30	14	10	10	20	20	00	00

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DEPARTMENT OF MECHANICAL ENGINEERING

Date	19th June 2024	Maximum Marks	50
Course Code	ME123ATE	Duration	90 Min
Semester	II	CIE-II	
FUNDAMENTALS OF MECHANICAL ENGINEERING			

Answer all the Questions.

#	Questions	M	BT	CO
1	State the areas of specialty in the study of mechatronic systems. And with the supporting block diagram, enumerate the Key elements of Mechatronics systems.	**10**	**L2**	**3**
2	With a neat, labelled sketch, elucidate how mechatronic systems enable the working of a modern day automatic camera.	**10**	**L2**	**3**
3	Explain in detail the working of a hydel power plant with a neat schematic diagram.	**10**	**L3**	**3**
4a	How are Engineering materials classified? Explain	**5**	**L1**	**3**
4b	List and explain the applications of the Polymer composites.	**5**	**L1**	**3**
5	What are ceramics? List and explain their properties and applications in detail.	**10**	**L1**	**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	20	10	00	00	00

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Department of Mechanical Engineering

Improvement Test

Date	02 July 2024	Maximum Marks	50
Course Code	ME113AT	Duration	90 Min
Course Name	Fundamentals of Mechanical Engineering	USN: 1RV23CDD11	

Answer all the Questions

#	Questions	M	BT	CO
1a	Differentiate Thermoset and Thermoplastic Polymers	5	L1	1
1b	Classify and explain properties of Polymer Composites with a block diagram.	5	L2	1
2a	Elaborate the mechanical properties of Mild Steel through stress- Stain diagram.	5	L2	1
2b	Explain with a neat diagram of Arc Welding procedure.	5	L3	2
3	What are the Types of computer vision in manufacturing and explain any four.	10	L3	2
4	Explain working principle of Compression-Ignition engine with a diagram	10	L2	4
5	Explain with block diagram for the below: a) Working of Parallel Hybrid Electric Vehicle b) Regenerative Braking principle	10	L3	4

ME113ATE / ME123ATE

USN | 1 | R | V | 2 | 3 | C | D | 0 | 3 | 1 |

RV COLLEGE OF ENGINEERING®

(An Autonomous Institution Affiliated to VTU)

I / II Semester B. E. Regular / Supplementary Examinations Aug-2024

FUNDAMENTALS OF MECHANICAL ENGINEERING

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

			M	BT	CO
1	1.1	Which type of materials is known for its excellent electrical conductivity?	01	1	1
	1.2	_____ steels are used in *RCC*.	01	1	1
	1.3	Define alloys?	01	1	1
	1.4	Dielectric strength is an example for _____ properties.	01	1	1
	1.5	What is Tensile strength?	01	1	1
	1.6	Name any two types of defects in welding.	01	1	1
	1.7	Piston rings are provided to maintain _____.	01	1	3
	1.8	_____ part of an engine converts linear motion of piston to rotary motion of crankshaft.	01	1	3
	1.9	_____ engine is called as constant volume cycle engine.	01	1	3
	1.10	Polyester is the example for _____ type of polymer.	01	1	2
	1.11	_____ type of control systems don't have feedback system.	01	1	4
	1.12	Define velocity ratio.	01	1	3
	1.13	What do you mean by drive trains?	01	1	3
	1.14	Gear have straight, parallel teeth that are aligned with the gear axis, the gear is called as _____.	01	1	3
	1.15	Give some examples for fossil fuels.	01	1	3
	1.16	What is regenerative braking?	01	1	3
	1.17	What are the significance of *ROM* and *RAM* in *CNC* machine.	02	1	3
	1.18	Give two examples for fossil fuels.	01	1	3
	1.19	What do you mean by hybrid vehicles?	01	1	3

PART-B

2	a	Define composite materials? Discuss the application of different types of composite materials.	08	2	1
	b	Discuss the physical properties of Metal.	08	2	1
3	a	Explain the various types of computer vision applications in manufacturing.	08	2	2
	b	What are the key components of a computer vision systems architecture, including hardware and software.	08	2	2
		OR			
4	a	What is arc welding? Explain the fundamental principle behind arc welding.	08	2	1
	b	Explain four differences between Welding and Soldering.	08	3	1

5	a	Explain different types of automation.	08	2	4
	b	Discuss the relative merits and demerits of *CNC* machine with traditional machining.	08	3	4
		OR			
6	a	Explain the concept of basic configuration such as Cartesian, Cylindrical and Spherical robots.	08	3	4
	b	Discuss the industrial application of Robotics.	08	3	4
7	a	With a neat diagram, explain the working principle of four stroke SI engine.	08	3	3
	b	With a neat diagram, enumerate the different types of gears based on the position of their axes.	08	3	3
		OR			
8	a	Explain the compound gear train with suitable examples.	08	3	3
	b	With a neat diagram, explain series hybrid electrical vehicle.	08	2	3
9	a	Describe the evolution of mechatronic systems and their role in modern engineering and application.	08	2	3
	b	Discuss the role of Mechatronics in *EMS*.	08	3	3
		OR			
10	a	Describe the different types of fossil fuels and their primary applications in energy production and industrial processes.	08	2	3
	b	Define global warming and its causes.	08	2	3