Question Bank

INTRODUCTION TO MECHANICAL ENGINEERING

QUESTION BANK

Semester	I / II	**Academic Year**	2026–27
Course Code	1BESC104D / 204D	**Course Name**	Introduction to Mechanical Engineering

MODULE-01

Q. No.	Question	M	L	C
1	List the major streams of Mechanical Engineering and state their significance in society.	6	L1	CO1
2	Explain the role of a mechanical engineer in solving any two real-life problems of social relevance.	8	L2	CO1
3	Describe the career opportunities available to graduates in Mechanical Engineering.	6	L2	CO1
4	With a neat schematic diagram, explain the construction and working principle of a Pelton turbine.	8	L2	CO1
5	With a neat sketch, explain the working principle of a centrifugal pump.	8	L2	CO1
6	Identify the major components of an automobile steering system and explain their functions.	8	L2	CO1
7	Explain the construction and working of a vehicle braking system with a suitable schematic diagram.	8	L2	CO1
8	Explain the working principle of a power steering system with a neat diagram.	8	L2	CO1
9	Classify flying machines and explain the basic parts required for making a drone.	8	L2	CO1

Aditya College of Engineering & Technology

10	Explain the working principle of a drone and describe the basic principles of refrigeration and air conditioning.	10	L2	CO1

MODULE-02

Q. No.	Question	M	L	C
11	Define an internal combustion engine and distinguish between petrol and diesel engines.	8	L2	CO2
12	With a neat sketch, explain the working of a four-stroke petrol engine.	8	L2	CO2
13	With a neat sketch, explain the working of a four-stroke diesel engine.	8	L2	CO2
14	Compare the petrol and diesel engines with respect to fuel supply, ignition and applications.	8	L2	CO2
15	List the major applications of I.C. engines in transportation and industry.	6	L1	CO2
16	Explain the basic components and working principle of an electric vehicle with a block diagram.	8	L2	CO2
17	Explain the construction and working of a hybrid vehicle with a suitable schematic diagram.	8	L2	CO2
18	Discuss the advantages and disadvantages of electric vehicles and hybrid vehicles.	8	L2	CO2
19	Classify gears and explain the applications of different types of gears.	8	L2	CO2
20	Differentiate simple and compound gear trains. Explain the concepts of automatic transmission and CVT.	10	L2	CO2

MODULE-03

Q. No.	Question	M	L	C
21	Define engineering materials and classify them with suitable examples.	6	L1	CO3

Aditya College of Engineering and Technology

22	Explain the important properties of engineering materials and their significance in material selection.	8	L2	CO3
23	Classify ferrous metals and explain the properties and applications of cast iron and steel.	8	L2	CO3
24	Explain the types, properties and engineering applications of non-ferrous metals.	8	L2	CO3
25	Differentiate ferrous and non-ferrous metals with suitable examples and applications.	8	L2	CO3
26	Define composite materials and explain their major constituents with a neat schematic representation.	8	L2	CO3
27	Classify composite materials based on the type of matrix and reinforcement, giving suitable examples.	8	L2	CO3
28	Explain the advantages, disadvantages and applications of composite materials.	8	L2	CO3
29	What are smart materials? Explain the working principle and applications of piezoelectric materials.	8	L2	CO3
30	Explain the working principles, advantages and applications of MR fluids and shape memory alloys.	10	L2	CO3

MODULE-04

Q. No.	Question	M	L	C
31	Define manufacturing and classify the major manufacturing processes with suitable examples.	6	L1	CO4
32	Explain the important criteria considered while selecting a manufacturing process for a component.	8	L2	CO4
33	Explain the basic principles of welding and describe any two common welding applications.	8	L2	CO4

Aditya College of Engineering and Technology

34	Differentiate welding, soldering and brazing based on the joining principle and applications.	8	L2	CO4
35	With a neat sketch, explain the main parts and working principle of a lathe machine.	8	L2	CO4
36	Explain the lathe operations of turning, facing and knurling with suitable sketches.	8	L2	CO4
37	With a neat sketch, explain the main parts and working principle of a drilling machine.	8	L2	CO4
38	Explain the drilling machine operations of drilling, reaming and tapping, and distinguish between them.	8	L2	CO4
39	With suitable sketches, explain end milling and face milling operations.	8	L2	CO4
40	Explain the basic components, advantages and applications of CNC machines. Also describe the basic principle of 3D printing.	10	L2	CO4

MODULE-05

Q. No.	Question	M	L	C
41	Define automation and classify the different types of automation.	6	L1	CO5
42	Explain the basic elements of an automated system with a suitable block diagram.	8	L2	CO5
43	Define mechatronics and explain the elements of a mechatronic system with suitable examples.	8	L2	CO5
44	Explain the working principle and applications of a potentiometer as a sensor.	8	L2	CO5
45	Explain the working principle and applications of a capacitive sensor.	8	L2	CO5
46	Describe the working principle of an optical encoder and list its applications.	8	L2	CO5

Aditya College of Engineering and Technology

47	Compare potentiometer, capacitive sensor and optical encoder based on their working principles and applications.	8	L2	CO5
48	Explain the need for integration of different technologies in modern engineering systems.	8	L2	CO5
49	What is ADAS? Explain the major functions and applications of an Advanced Driver Assistance System.	8	L2	CO5
50	Analyse how automation, mechatronics, sensors and integrated technologies contribute to advances in Mechanical Engineering.	10	L4	CO5

Note:

1. Each module contains 10 questions; total number of questions: 50.
2. Marks are assigned in the range of 6 to 10 as indicated against each question.
3. RBTL levels are indicated using the revised Bloom's Taxonomy: L1–Remember, L2–Understand, L3–Apply, L4–Analyze.
4. Course Outcomes are mapped according to the course outcomes listed in the prescribed syllabus.

Aditya College of Engineering and Technology