

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

Third Semester

Chemical Engineering

CH3301-Basic Mechanical Engineering

Regulations – 2021

Duration : 3 Hrs

Maximum : 100 Marks

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BTL	CO	Marks
1.	What is Steady Flow Energy Equation? Give an example.	L1	1	2
2.	What is the significance of the Third Law of Thermodynamics?	L1	1	2
3.	Define the throttling process and its effect on temperature.	L1	2	2
4.	Show the relationship between internal energy and work done in an isothermal process?	L2	2	2
5.	What is the Dual Combustion Cycle? Give its basic features.	L1	3	2
6.	List the steps involved in a Carnot cycle.	L1	3	2
7.	Define Brake Thermal Efficiency (BTE) in an I.C. engine.	L1	4	2
8.	Write short notes on Latent Heat of steam.	L1	4	2
9.	Define Kinematic Link in mechanical systems.	L1	5	2
10.	What is the purpose of a flywheel in a mechanical system?	L1	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No	Questions	BTL	CO	Marks
11.	a Explain the First Law of Thermodynamics with a suitable example. Derive the equation for internal energy. Or	L2	1	16
	b Explain the working principle of a Heat Pump and compare it with a Heat Engine.	L3	1	16
12.	a Derive and explain the expressions for work done, heat transfer, and internal energy in an adiabatic process. Or	L3	2	16
	b Derive the work done, heat transfer, and internal energy change for a polytropic process.	L3	2	16

13.	a	Derive an expression for the efficiency of an Otto cycle.	L3	3	16
		Or			
	b	Compare the Carnot cycle, Otto cycle, and Diesel cycle in terms of their thermodynamic processes and efficiencies.	L4	3	16
14.	a	Explain the various types of steam turbines and their applications in power generation.	L3	4	16
		Or			
	b	Discuss the thermodynamic processes involved in the working of an I.C. engine and the factors influencing engine performance.	L3	4	16
15.	a	Explain the concept of Kinematic Chains, Pairs, and Links with suitable examples and applications.	L2	5	16
		Or			
	b	Explain the different types of gear trains and their applications in mechanical systems.	L2	5	16