R18 Regulation *Subject code:2P6CB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VI Semester Supplementary Examinations, November 2025

HEAT TRANSFER

(ME)

Maximum Marks: 70 Date: 11.11.2025 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20 Marks)		Marks	CO	BTL
1	What is mean by conduction heat transfer?	2M	1	L1
2	Give examples for convection heat tranfer.	2M	1	L1
3	What is the function of insulating materials?	2M	2	L1
4	Give examples for Transient heat transfer.	2M	2	L1
5	What is meant by periodic heat transfer?	2M	3	L1
6	Differentiate between laminar and turbulent flow.	2M	3	L1
7	What is mean by drop wise condensation?	2M	4	L1
8	What is the function of insulating materials?	2M	4	L1
9	Define regenerator and recuperator ?	2M	5	L1
10	What are the advantages of NTU method over the LMTD method?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Derive the general conduction equation for Cartesian co-ordinate system?	10M	1	L2
	OR			
12	A Stainless-steel plate is of 2 cm thick is maintained at a temperature of 650^0C at one face and 50^0C on the other. The thermal conductivity of stainless steel at 400^0C is 22.1 W/m K. Calculate the heat transferred through the material per unit area?	10M	1	L2
13	Derive the expression for temperature distribution under one dimensional steady state heat conduction for a cylinder?	10M	2	L2
	OR			
14	Briefly describe about lumped heat capacity system. Give its examples.	10M	2	L2
15	Derive the heat dissipation from a fin insulated at the tip.	10M	3	L2
	OR			
16	Derive the heat dissipation from an infinitely long fin.	10M	3	L2
17	A vertical cylinder 5 cm diameter and 1 m high is maintained at a temperature of 65^0 C in atmosphere of air at 15^0 C. Calculate the rate of heat loss by free convection from the cylinder to air.	10M	4	L2

	OR			
18	Derive the equation for parallel flow heat exchanger using NTU method.	10M	4	L2
19	Define shape factor. Derive the expression for shape factor between two black bodies.	10M	5	L2
	OR			
20	What is Stefan Boltzman Law? Explain the concept of total emissive power of a surface.	10M	5	L2