R20 Regulation *Subject code:3P3CE*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, December 2024

METALLURGY AND MATERIAL SCIENCE

(Mechanical Engineering)

Maximum Marks: 70 Date:11.12.2024 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 which carries 10M.
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)		CO	Bloom Tx
1	Define unit cell	1	L1
2	Define alloy and Toughness	1	L1
3	Define phase rule	2	L1
4	Define Lever Rule	2	L1
5	Define Hardening and Tempering	3	L1
6	What do you mean by heat treatment processes?	3	L1
7	Write the classification of cast iron?	4	L1
8	Draw microstructure of grey cast iron.	4	L1
9	Write down applications of ceramics?	5	L1
10	Write the properties of polymers?	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	Define the term recrystallisation and describe the solidification of pure metal with a neat sketch. [10M]	1	L2
	OR		
12	What is the necessity of alloying and explain Hume –Rothery rules? [10M]	1	L2
13	Explain with neat graphs cooling curves of pure metal with slow cooling and super cooling. [10M]	2	L2
	OR		
14	Derive the phase rule with a neat sketch [10M]	2	L2
15	Explain Iron- Iron Carbide diagram with neat sketch. [10M]	3	L2
	OR		
16	Explain the Construction of TTT diagram [10M]	3	L2

17	Explain copper-tin equilibrium diagram and mechanical properties. [10M]	4	L2
	OR		
18	Explain AL-CU equilibrium diagram and mechanical properties. [10M]	4	L2
19	Write the classification and application of ceramics? [10M]	5	L2
	OR		
20	Write the classification, properties, applications and advantages and disadvantages of glass? [10M]	5	L2