



R18 Regulation

Subject code:2P3CD

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, December 2025

## METALLURGY & MATERIAL SCIENCE

(ME)

Maximum Marks: 70

Date:22.12.2025

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 the necessity of Alloying?	2M	1	L1
2	Find the packing efficiency in BCC lattice.	2M	1	L1
3	What do you mean by Isomorphous system?	2M	2	L1
4	Define lever rule and eutectoid transformation.	2M	2	L1
5	Explain Normalising	2M	3	L1
6	Write the composition of Naval brass.	2M	3	L1
7	What are the effects of non-equilibrium cooling of alloys?	2M	4	L1
8	write short note on white cast iron.	2M	4	L1
9	write the classification of polymers.	2M	5	L1
10	write a short note on alloys	2M	5	L1

### Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	What is an interstitial solid solution; name the five elements which commonly form interstitial solid solutions?	10M	1	L2
OR				
12	Determination of grain size by any two methods.	10M	1	L2
13	Apply the Lever rule to phase equilibrium in an alloy of 15% B and 85% A when a liquid of 45% B is in equilibrium with a solid solution of 95% A.	10M	2	L2
OR				
14	Explain eutectic & peritectic system with suitable phase diagram.	10M	2	L2
15	Draw the Fe-Fe <sub>3</sub> C Diagram and label all the points, lines, temperatures and reactions.	10M	3	L2

	OR			
16	Draw the TTT diagrams and explain the different cooling rates.	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, properties, applications and advantages and disadvantages of composite materials?	10M	5	L2
	OR			
20	Write the classification and application of ceramics?	10M	5	L2