



R20 Regulation Subject code: 3P3CE  
**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**  
(Autonomous, Accredited by NAAC with 'A+' Grade)

**B.Tech III Semester Supplementary Examinations, July 2024**

**Metallurgy and Material Science  
(ME)**

**Maximum Marks: 70**

Date: 27.07.2024 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 solid solution and write types of solid solutions		1	L1
2	Define malleability and ductility with suitable examples.		1	L1
3	Define eutectoid transformation system.		2	L1
4	How many methods to construct Phase diagram and what are they		2	L1
5	Briefly explain Hardenability.		3	L1
6	Define Phase diagram		3	L1
7	What are the effects of carbon in properties of steel		4	L1
8	write short note on white cast iron.		4	L1
9	Write down applications of ceramics		5	L1
10	Write down any two properties and applications of FRP		5	L1

**Part-B**

Answer All the following questions.		(5X10M=50Marks)		
11	Define space lattice and unit cell and also how are space lattice mainly classified? Explain with sketches. [10]		1	L2
OR				
12	Describing the factors promoting grain size of steel. What is the effect of grain size on Mechanical properties? [10]		1	L2
13	Explain Lever rule with suitable phase diagram. [10]		2	L2
OR				
14	Draw and explain the phase diagram where two components are completely soluble in both liquid and solid state with suitable examples. [10]		2	L2
15	Explain TTT diagram with neat sketch. [10]		3	L2
OR				
16	Define Surface hardening and classify in detail. [10]		3	L2

17	Explain brass with equilibrium diagram and mechanical properties. [10]	4	L2
	OR		
18	Explain Grey cast iron with equilibrium diagram and mechanical properties. [10]	4	L2
19	Explain the different types of fibers used in FRP along with their properties. [10]	5	L2
	OR		
20	Explain crystallization of polymers with a neat diagram of amorphous polymer and crystalline polymer. [10]	5	L2