

**R18 Regulation****Subject code: 2P3CD****TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**

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

B.Tech III Semester Supplementary Examinations, February 2024**METALLURGY AND MATERIAL SCIENCE****(ME)****Maximum Marks: 70****Date: 23.02.2024****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	BTL
1	What is the necessity of alloying?	CO1	L1
2	What is ASTM grain size number?	CO1	L1
3	What is coring?	CO2	L1
4	Define congruent melting phase.	CO2	L1
5	Give the composition of high speed steel.	CO3	L2
6	Why tempering is required immediately after hardening process.	CO3	L2
7	Explain the effect of Manganese, Sulphur and Phosphorus in Grey cast Iron.	CO4	L1
8	What is admiralty brass?	CO4	L1
9	What are the functions of reinforcing phase in composites?	CO5	L1
10	Compare Soda lime and Pyrex glass.	CO5	L2

Part-B

Answer All the following questions. (5X10M=50Marks)		M	CO	BTL
11	Write explanatory notes on ASTM grain size measuring methods.	10M	CO1	L2
	OR			
12	A. What are Hume-Rothery's rules? Explain. B. Define atomic packing factor for FCC crystals.	5M 5M	CO1	L2
13	Explain Isomorphous alloy system by selecting a suitable example.	10M	CO2	L2
	OR			
14	List out the various methods to construct Phase diagrams and explain the construction procedure using Cooling curves.	10M	CO2	L3
15	Construct TTT diagram and explain the different cooling rates.	10M	CO3	L3
	OR			
16	Draw Fe-Fe ₃ C phase diagram and explain various invariant reactions in the diagram.	10M	CO3	L3
17	Explain the production of Malleable cast iron? Give their applications.	10M	CO4	L2
	OR			
18	Draw and Explain the Cu-Al phase diagram	10M	CO4	L3
19	Enumerate the characteristics, properties and applications of composites and polymers.	10M	CO5	L3
	OR			
20	Enumerate the characteristics, properties and applications of Polymers.	10M	CO5	L3