R17 Regulation *Subject code:1P3CD*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech II Year I Semester Supplementary Examinations, March/April 2023

Metallurgy and Material science

(Mechanical Engineering)

Maximum Marks: 70 Date:04.04.2023 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)

1 Define metallurgy and material science.
2 Define malleability and ductility with suitable examples.
3 Define Gibbs Phase rule.
4 Write the different types of cooling curves.
5 Define Hardenability.
6 What do you mean by heat treatment processes?
7 Write the classification of cast iron.
8 Write about white cast iron?
9 Write the classification of polymers?
10 Write about non-metals?

Part-B

Answer All the following questions. (5X10M=50Marks)

11 Explain BCC & HCP with their packing efficiency in detail. [10]

OR

12 Define toughness, strength, fatigue, creep and hardness. [10]

13 Explain Lever rule with suitable phase diagram. [10]

OR

14 From the data given below for Bi – Cd system plot the equilibrium diagram to scale and find:
(i) Amount of Eutectic in 20% Cd alloy. (ii) Free Cd in 70% Cd alloy. [10]
Given : Melting point of Bi = 271^0c
Melting point of Cd = 321^0c
Eutectic temperature = 144^0c
Eutectic composition =39.7% Cd

15 Explain Iron- Iron Carbide diagram with neat sketch. [10]

OR

16 Define annealing and describe types of annealing? [10]

17 Explain brass with equilibrium diagram and mechanical properties? [10]

OR

18 Explain white cast iron with equilibrium diagram and mechanical properties? [10]

19 Write the classification and application of ceramics? [10]

OR

20 Write the classification, properties, applications and advantages and disadvantages of composite materials? [10]