Regulation R18

Subject code: 2P3CD

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, March/April 2023

Metallurgy & 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 What is the necessity of Alloying?
2 Find the packing efficiency in BCC lattice.
3 What do you mean by Isomorphous system?
4 Distinguish between Intermetallic Compound and Electron compound.
5 Differentiate between annealing and normalizing.
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 Classify non-ferrous metals.

Part-B

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

11 What is an interstitial solid solution; name the five elements which commonly form interstitial solid solutions? 10

OR

12 Determination of grain size by any two methods. 10

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. 10

OR

14 Discuss the eutectic & peritectic system with suitable phase diagram. 10

15 Draw the Fe-Fe3C Diagram and label all the points, lines, temperatures and reactions. 10

OR

16 Draw the TTT diagrams and explain the different cooling rates. 10

17 a) Draw the partial Al-Cu phase diagram (up to 10% Cu) and explain engineering significance of Al with 4-5% Cu. 5
b) Explain how the property of aluminum alloys changes on hardening. 5

OR

18	Explain Grey cast iron with equilibrium diagram and mechanical properties?	10
19	Write the classification, properties, applications and advantages and disadvantages of composite materials?	10
	OR	
20	Write the classification and application of ceramics?	10