

Code No.: ME302PC

R20

H.T.No.

8

R

CMR ENGINEERING COLLEGE: : HYDERABAD

UGC AUTONOMOUS

II-B.TECH-I-Semester End Examinations (Supply) – August - 2023

MATERIAL SCIENCE AND METALLURGY

(MECH)

[Time: 3 Hours]

[Max. Marks: 70]

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(20 Marks)

1. a) Define Unit cell? [2M]
- b) Compare slip and twinning? [2M]
- c) What are the types of solid solutions? [2M]
- d) Define pearlite and austenite? [2M]
- e) What are the objectives of hardening? [2M]
- f) Define hardenability? [2M]
- g) Give the classification of surface hardening treatments? [2M]
- h) Write a short note on subzero treatment. [2M]
- i) Write the composition of cartridge brass? [2M]
- j) Write a short note on HSS? [2M]

PART-B

(50 Marks)

2. Compare the physical, chemical and mechanical properties of ceramics with those of metals? [10M]

OR

3. What is line defect? Explain in detail, about various line defects? [10M]

4. What is Lever rule? Explain how it is useful? [10M]

OR

5. What are the invariant reactions in iron –iron carbide equilibrium diagram? Explain Them? [10M]

6. Explain the austenite to pearlite transformation in detail? [10M]

OR

7. Draw the TTT diagrams and explain the different cooling rates. [10M]

8. Explain in detail the flame and induction hardening with neat sketches? [10M]

OR

9. Differentiate between austempering and martempering? [10M]

10. Differentiate between the terms brass and bronze? [10M]

OR

11. Draw and explain the Cu-Zn phase diagram? [10M]
