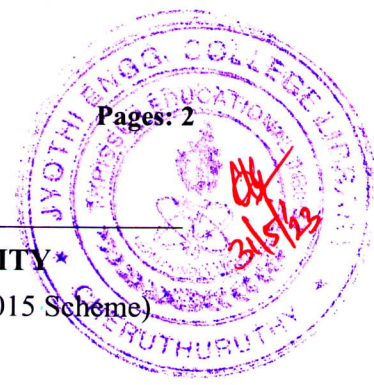


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth Semester B.Tech Degree (S, FE) Examination May 2023 (2015 Scheme)

**Course Code: ME210****Course Name: METALLURGY AND MATERIALS ENGINEERING (MC)**

Max. Marks: 100

Duration: 3 Hours

PART A*Answer any three questions, each carries 10 marks.*

Marks

- 1 Find out the effective number of atoms and co-ordination number for SC, BCC, FCC and HCP structure using figure. (10)
- 2 a) Define Schmid's law. (4)
b) Write a short note on Miller indices (6)
- 3 Demonstrate the methods polishing and etching to determine the micro structure and grain size. (10)
- 4 Differentiate between SEM and TEM (10)

PART B*Answer any three questions, each carries 10 marks.*

- 5 Describe in detail about laser and electron beam hardening processes with neat figure (10)
- 6 Illustrate time-temperature transformation diagram with different cooling curve (10)
- 7 Narrate the theory of tempering. Why steel is tempered and how it is done (10)
- 8 a) Give a brief description about the composition of cast iron. (5)
b) List out non ferrous alloys (5)

PART C*Answer any four questions, each carries 10 marks.*

- 9 a) Demonstrate stress concentration (5)
b) Investigate the effects of impact loading on ductile material? (5)
- 10 a) Classify matrix phase? (6)
b) List out the characteristics of fiber phase. (4)
- 11 What are various factors leading to crack propagation. Explain in detail. (10)
- 12 a) Elucidate the different crystal structure of ceramics. (6)
b) List out the features of super alloys (4)

- 13 Write short note on (10)
i) Smart materials
ii) Bio materials
- 14 What is the need of modern engineering material? List out the properties of (10)
modern engineering materials.
