

H1

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Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth Semester B.Tech (Hons) Degree Examination July 2021 (2019 admission)

Course Code: : MET296

Course Name: MATERIALS IN MANUFACTURING

Max. Marks: 100

Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks)

| | | Marks |
|----|---|-------|
| 1 | Explain about crystallization. | (3) |
| 2 | What are Miller indices? | (3) |
| 3 | What are the characteristics of high-temperature materials? | (3) |
| 4 | What is Freckles defect? | (3) |
| 5 | Classify super alloys. | (3) |
| 6 | Why Nickel is used as high temperature material? | (3) |
| 7 | Define creep. | (3) |
| 8 | Discuss the effect of Niobium addition on steel. | (3) |
| 9 | Explain about maraging steel. | (3) |
| 10 | List the classes of Laves phase. | (3) |

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

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|----|--|------|
| 11 | a) Explain plastic deformation by slip. | (6) |
| | b) Explain dislocation generation by Frank Read source. | (8) |
| 12 | List the primary bonds. Give examples for each bond and explain the characteristics of each. | (14) |

Module,-2

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|----|--|------|
| 13 | Explain about Electroslag remelting with a neat sketch. Also list the advantages of Electroslag remelting. | (14) |
| 14 | Explain about Vacuum induction melting for Nickel alloys. | (14) |

Module -3

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|----|---|------|
| 15 | Explain about the major phases of Nickel base super alloys. | (14) |
| 16 | Explain about the strengthening mechanisms of super alloys. | (14) |

Module -4

- 17 Explain about heat transfer and formation of defects during directional solidification. (14)
- 18 Explain about the fatigue behaviour of single crystal super alloys. (14)

Module -5

- 19 a) Explain about martensitic transformation in steel. (8)
- b) Explain the properties TZM and TZC. (6)
- 20 Draw and explain the Magnesium-Lead phase diagram. (14)
