

M.TECH MATERIAL ENGG FIRST YEAR SECOND SEMESTER EXAM 2024**SUBJECT: HIGH TEMPERATURE MATERIALS****Time: 3 hours****Full Marks: 100****Answer any four (4) questions.**

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| 1 | What are the applications of polymers at high temperatures? What is polymerization? What are the differences of thermoplastic and thermosetting polymers? | 8+7+
10 |
| 2 | What are the uses of the coarse grained materials at high temperature? Why are oxides used at high temperature? What is the equilibrium temperature? What is Larson-Miller parameter? What are the uses of Larson-Miller parameter? | 6+6+
6+3+
4 |
| 3 | What are uses of solid solution strengthening in high temperature materials? What is order hardening? What are the reasons to choose face centered cubic materials at high temperature? | 8+5+
12 |
| 4 | What are the stages of creep? What are the differences between constant load and constant stress creep curves? What are the reasons to choose low stacking fault energy materials at high temperatures? What are the importances of high temperature tensile tests? | 10+6
+4+5 |
| 5 | What are the strengthening mechanisms in the particle reinforced composite? What are the effects of the size and amount of particles on the strength of the particle reinforced composites? What are the requirements of the critical length of the fibers in fiber reinforced composites? | 8+10
+7 |
| 6 | What are the importances of orientation of fibers in strength and fracture of the fiber reinforced composites? What are the differences between the Fireclay and Silica refractories? Why are Silica refractories used in the furnace and the containment vessel? What are the causes of brittle fracture in refractories? | 7+6+
6+6 |