

22241

M. Tech. 3rd Semester (ME)

Examination, Dec.-2018

MACHINE DESIGN

Paper- M-821-A

Mechanical Behaviour of Materials

Time allowed : 3 hours] [Maximum marks : 100

Note: Attempt any five questions. All questions carry equal marks.

1. (a) What are lattice defects? Explain different lattice defects in detail. 10
- (b) Explain stress field of a dislocation and what are the forces between dislocation. 10
2. (a) What is necking in tension? How necking is formed in a work piece of mild steel? 10
- (b) Discuss the effect of gauge length on strength and elongation. 10
3. Show creep strain and creep time curves with detailed discussion. Also write about low temperature creep theories. 20
4. Explain the following: 20
 - (a) Stress concentration
 - (b) Stress cycle
 - (c) Strain Hardening exponent
 - (d) Fatigue curve.

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5. (a) What is corrosion? Explain the concept of corrosion and its prevention in detail. 10
- (b) Explain the mechanism of plastic deformation with the help of neat sketch. 10
6. Write a short note on brittle failure. Also explain the concept of transition temperature in brittle failure. What are the factors affecting the transition temperature? 20
7. Explain the following: 20
- (a) Understressing and over stressing.
- (b) Stress Rupture
- (c) Temper and Hydrogen embrittlement.
8. What is Fatigue? How Fatigue strength can be determined? What are Factors affecting Fatigue size and surface? 20