

Time: 3 hour

Max Marks:80

Note: 1. Q1 is compulsory.
2. Solve any three from remaining.

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| Q1 | Write the short notes on the following. (Any four) | 20 |
| | <ol style="list-style-type: none"> 1. Point defects 2. Creep testing 3. Annealing 4. Tool steels 5. Rheological fluids | |
| Q2 | A. Define strain hardening? State and explain dislocation theory of strain hardening. | 10 |
| | B. Define fatigue strength and fatigue limit. Explain the mechanism of fatigue failure. | 10 |
| Q3 | A. Draw neat iron - iron carbide diagram indicating all important temperature, phases and compositions. Explain slow cooling of alloy containing 0.3% c steel, when cooled from 1600 ^o c to room temperature. | 14 |
| | B. Explain synthesis of nano materials. | 6 |
| Q4 | A. What is hardening heat treatment? Discuss in detail mechanism of martensite transformation. Explain why tempering is always followed by hardening heat treatment. | 12 |
| | B. Discuss the effect of alloying elements on eutectoid temperature. | 8 |
| Q5 | A. Compare between elastic and plastic deformation. Explain slip mechanism of deformation. | 10 |
| | B. What are the factors affecting on fatigue fracture? | 10 |
| Q6 | Write short notes on | 20 |
| | <ol style="list-style-type: none"> 1. Subzero Heat Treatment 2. limitations of plain carbon steel 3. Eutectic phase diagram 4. Edge dislocation | |
