

S.E. (Mech) (Sem-III) (CBCGS) (P-20-21) (C Scheme)

Duration: 3 Hours

Total Marks: 80

N.B.:

- 1) Question No.1 is compulsory.
- 2) Solve any three from the remaining questions
- 3) Figures to RHS indicate full marks.
- 4) Draw neat sketches wherever necessary.

Q. 1 Solve any Four out of Six.**20**

- a) Differentiate between Slip and Twinning.
- b) Differentiate between Ductile fracture and Brittle fracture.
- c) Explain Hardenability Test.
- d) Explain Magnetic particle testing.
- e) Define composite and discuss its classification.
- f) Explain Classical creep curve.

Q. 2 a) Draw and explain Time Temperature Transformation diagram. Also indicate various cooling patterns on the diagram.**10****b) Draw and explain Screw type injection moulding process with its advantages, limitations.****10****Q. 3 a) What is fatigue? Explain fatigue testing in detail.****10****b) How surface hardening different from case hardening? Explain carbonitriding in detail.****10****Q. 4 a) Classify crystal imperfections. Distinguish between Edge and Screw dislocation.****10****b) Derive an expression for Griffith's theory of brittle fracture.****10****Q. 5 a) Explain Peritectic and Eutectic reaction with neat sketch.****10****b) Explain critical resolved shear stress, Derive an expression for the same.****10****Q. 6 Write short notes on (Any four)****20**

- a) Classification of materials.
 - b) Modes of deformation in materials.
 - c) Nano materials and their synthesis route.
 - d) Austempering Process.
 - e) Isomorphous phase diagram.
 - f) Work hardening.
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