

**Code: 9D15105**

M.Tech I Semester Supplementary Examinations August 2016

**MATERIALS TECHNOLOGY**

(Machine Design)

(For students admitted in 2012, 2013, 2014 & 2015 only)

Time: 3 hours

Max. Marks: 60

Answer any FIVE questions  
All questions carry equal marks

\*\*\*\*\*

- 1 Explain slip mechanism of plastic deformation. What is critical resolved shear stress? Derive its expression for deformation by slip.
- 2 (a) What is super plasticity as applied to metals? To what extent this phenomenon related to micro structure.  
(b) Differentiate between dispersion and particulate strengthening.
- 3 (a) Define creep. Draw classical creep curve. Explain each stage in detail.  
(b) Discuss the development of creep resisting alloys.
- 4 (a) Define fatigue failure. Give examples of components prone to fatigue failure.  
(b) Explain the mechanism of fatigue failure.
- 5 (a) Explain the selection and design in relation to anticipated service.  
(b) Explain different ways of assessing materials for resistance to fracture.
- 6 (a) Explain the composition, microstructure, properties and applications of transformation induced plasticity steels.  
(b) Brief about the various important Aluminides.
- 7 (a) Explain smart materials with suitable examples.  
(b) What are nano-crystalline materials? Discuss various mechanical properties and applications of nano-crystalline materials.
- 8 What electrical and optical applications of polymers? Explain using examples.

\*\*\*\*\*