JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH I SEMESTER EXAMINATIONS, APRIL/MAY-2012
FATIGUE, CREEP & FRACTURE MECHANICS
(MACHINE DESIGN)

Time: 3hours   Max.Marks:60

Answer any five questions
All questions carry equal marks
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1.a)   Explain stress intensity factor and strain energy release rate.
  b)   Explain briefly the ductile/brittle fracture transition temperature for notched and unnotched components?

2.a)   Discuss the method of representing the principal stresses and strains by Mohr's circle.
  b)   Explain why actual strength of the material is different from ideal strength?

3.a)   Explain different modes of crack opening.
  b)   Explain Irwin plastic zone correction and Dugdale approach.

4.a)   What is low cycle fatigue. State Coffin-Manson law.
  b)   Explain microstructural models of crack initiation under fatigue conditions.

5.   Discuss the empirical laws of fatigue failure.

6.   Discuss the factors affecting the fatigue life of welded joints.

7.   What are the Creep properties? Explain Creep-fatigue interaction.

8.   Write short notes on the following
      a) Miner's law
      b) R-curve analysis and
      c) Paris-Erdogan law.

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