

School of Engineering
Department of Mechanical Engineering
Mid Term Examination

Exam Date: 27 Sep 2023
Time : 90 Minutes
Marks : 50

Sem III - MCCR5029 - Fracture Mechanics
Your answer should be specific to the question asked
Draw neat labeled diagrams wherever necessary

- 1) List three factors that can influence fracture toughness. K2 (2)
 - 2) Compare the fracture behavior of ceramics and metals under tensile loading. K1 (3)
 - 3) Devise an experimental procedure to investigate the effect of crack tip blunting on fracture toughness. K2 (4)
 - 4) Propose a heat treatment process to improve the fracture toughness of a steel alloy. K2 (6)
 - 5) Examine experimental data on crack growth rates and determine the material's fatigue crack growth curve. K3 (6)
 - 6) Define stress intensity factor (K) and its units. K3 (9)
 - 7) Develop a risk assessment model to estimate the probability of failure for critical structures under various loading scenarios. K4 (8)
 - 8) Develop a fatigue life prediction model for a component subjected to variable amplitude loading. K4 (12)
- OR**
- Analyze the effect of crack length on the stress intensity factor in a plate with a semi-elliptical surface crack. K4 (12)