# Sample MECH 326 RAP Quiz

## 1 Instructions

**This test is closed-book. Electronic devices and aids must be put away. Standard exam policies apply.**

**Part 1: Individual** – for each of the following questions, mark your response **in pencil** on the computer score card. When time is up, place your score cards in your individual folder and hold onto this booklet.

**Part 2: Team** – once you receive your team folder, work as a team and mark your responses by scratching the appropriate boxes on the IF-AT (scratch) cards.

| Reveal a ★ in 1 scratch for 4 pts, 2 scratches for 2 pts, 3 scratches for 1 pt, 4 or 5 scratches 0 pts. |
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Record your total score and team name in the space at the top of the card. You can appeal any question using the included form. Place your IF-AT card, **all** exam booklets, and your appeal form in your team folder and hand it in. **You must return all booklets – your entire team will receive a score of zero on both the individual and team portions of the RAP quiz if any booklets are missing from the folder.**

## 2 RAP Quiz Questions

Choose the best response - a given question may have more than one choice that is correct but marks will only be given for the best answer.

1. **What is fracture toughness?**
   a) The area under the stress-strain curve for the material near a crack
   b) The local yield strength in the material at a crack tip
   c) The local fracture strength in the material at a crack tip
   d) The critical stress intensity factor
   e) The ratio of the critical stress intensity to the stress intensity factor

2. **In practice, the theoretical stress concentration factor, $K_t$, is often ignored (set to unity) under which condition(s)? (choose a single *best* response)**
   a) The material is ductile
   b) The material is brittle
   c) The material is ductile and the loading is cyclical
   d) The material is ductile and the loading is static
   e) The material is brittle and the loading is axial

3. **The von Mises stress is given by $\sigma' = \frac{1}{\sqrt{2}}\sqrt{(\sigma_1 - \sigma_2)^2 + (\sigma_2 - \sigma_3)^2 + (\sigma_3 - \sigma_1)^2}$. Why does shear stress not appear in this equation?**
   a) The expression above is based on principal stresses
   b) Shear stresses do not cause distortion of an element
   c) Shear stresses average to zero on a small element
   d) For cases where von Mises is used, only hydrostatic forces matter
   e) The $\sigma'$ expression above is for normal stress only – there is a separate equation for $\tau'$