MAE 160 –Final Exam

I. Derivations

1. Goodman's equation for fatigue
2. Fatigue behavior of cracked components; total # of cycles as a function of delta K
3. Power law creep equation
4. Creep relaxation equation
5. Basquin and Coffin-Manson relationships for fatigue
6. Goodman equation

II. Conceptual Questions

1. Appearance of a fatigued shaft with three zones
2. Different types of fatigue testing specimens
3. Creep curves for different stresses and temperatures
4. Creep fracture, mechanism, and equation
5. Two mechanisms of creep: dislocation creep and diffusion creep
6. Deformation mechanism maps
7. Superalloys: evolution and new methods to increase temperature capability
8. Thermodynamic efficiency of jet engines

III. Homework

17.1, 2, 3
18.1,
19.1, 20.1, 2, 3, 6
23.1, 23.2, 23.3, 23.4