ME 460/660, Mechanical Vibration — Final Exam, Fall 1997

Closed book, closed notes. Use one $8\frac{1}{2} \times 11$ formula sheet, front and back. Test books will be provided.

1. Define the following variables and state which ones are parameters of a system and which ones define the state of a system. (2 points each, 30 total)

   (a) ω

   (b) ω_{dr}

   (c) ω_b

   (d) M

   (e) K

   (f) $\tilde{\text{K}}$

   (g) P

   (h) S

   (i) $\mathbf{x}(0)$

   (j) $\mathbf{x}(t)$

   (k) $v(t)$

   (l) c

   (m) ζ

   (n) δ

   (o) T

2. On what principle is the Energy Method based? As a result, when is it *invalid* to use the Energy Method? (10 points)

3. A machine was started up earlier today and has been run at a constant speed since. An accelerometer placed on the machine picks up a single frequency. What is the variable name of that frequency (write the variable), and what does it represent? (5 points)

4. Determine the Fourier series representation of the function shown below. (20 points)