ME 586 Review Questions
Exam #2, Fall 2002

Do you understand?

1. Difference between sensor accuracy and sensor precision?
2. Difference between sensor resolution and sensor sensitivity?
3. Importance of sensor response time?
4. Difference between relative encoder and absolute encoder?
5. The concept of a digital drive?
6. IEEE 1394?
7. Design features of an AC induction motor?
8. Difference between an AC induction motor and a brushless permanent magnet AC motor?
9. A variable/switched reluctance motor?
10. The function of structured lighting?
11. The purpose of a histogram in vision imaging?
12. Difference between continuous production and batch production? And how these differ between the process industries and the discrete manufacturing industries?
13. Manufacturing lead time?
14. Production rate (inverse of operation cycle time for large batches – converted to hrs)?
15. Operation cycle time for a work unit?
16. Production/plant capacity?
17. WIP?
18. How a resolver works?

Could you?

1. Define a drive in the building blocks sense?
2. List the common sensors being used in automation and their advantages and disadvantages?
3. Given the number of bits used to encode an angular rotation, could you the least significant digit in the decoded angular value?
4. Define PWM and how it works?
5. Convert an analog signal to a binary number, given the number of bits and voltage range?
6. Convert a digital value to an analog value, given the reference voltage?
7. Describe how electromagnetic fields are used to drive rotors in motors (in a general way)?
8. Define a vision system?
9. Convert a grey scale image to a binary image given a threshold setting?
10. Can you define segmentation, pattern recognition,…?
11. Provide several examples of vision system usage?
12. Take a binary image with one blob and calculate its centroid and area given the pixel to mm scales for the image X and Y pixel directions?
13. Distinguish between processing operations (alter shape) and assembly operations?
14. Apply the equations of Chapter 2 to determine number of production operations, production rates, enumerate the required resources, etc.?
15. Distinguish between utilization and availability?
16. Distinguish between MTBF and MTTR?
17. Distinguish between fixed and variable costs?
18. Describe the purpose of vibratory feeders?
19. Define OCR?