UNIVERSITY OF SASKATCHEWAN
DEPARTMENT OF ELECTRICAL ENGINEERING
EE 328.3 – Engineering Design II

Final Examination

April, 2001

Instructor: R. E. Gander and A. Kostiuk

Time: 3 Hours

Notes: **Open Book Exam**

1 textbook, course notes, and course assignments allowed.

ANSWER ALL QUESTIONS (1 – 5)

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[15] 1. For those unfamiliar with a formal design process, describe the difference between a Statement of Work, a Requirements Specification, and a System Specification (one short paragraph for each should be sufficient). Include, using examples, how information on the same item or task is presented differently in each of the three documents.

[15] 2. For your dc current source (wood burner), identify the main causes for inefficient power consumption. Note: a circuit diagram of your design will be useful in understanding your explanation. What changes could be made to increase the overall efficiency?

[20] 3. Write a statement of work for a weigh scale. Note: you will have to describe the application(s) for this weigh scale as part of the statement of work.

[10] 4. a) With regard to the telephone system design project, list any guidelines or procedures that you can distill from your experience that would allow you to do a subsequent design more quickly.

[10]   b) In comparing estimated costs for the whole class, it became clear that using one Jumper Wire Interface box versus two was not a strong factor in the overall cost. What were the two most important factors that caused one design to be more expensive than another?

[30] 5. A local astronomy club wishes to automate a manual dome (motor controlled with a three position manual switch (off, rotate clockwise, and rotate counterclockwise)) on their observatory. The dome is a hemispherical roof with an opening on one side for the telescope to look out of and the whole dome rotates horizontally on casters. They have a telescope that is capable to continually sending the direction the telescope is currently pointing out a standard computer serial port. As the telescope moves, the dome needs to track it so that the telescope is always pointing out the dome opening. The dome is 4m in diameter and requires a positioning accuracy of +/- 5 degrees.

Do a preliminary system design for the automated dome. Provide a block diagram of the system, and describe the function of each block. Define any signals flowing between the blocks in as much detail as possible.

The End