

UNIVERSITY OF SASKATCHEWAN
COLLEGE OF ENGINEERING
EE 328 - Engineering Design II
Final Examination

April 1998

Instructors: J.G. Huff and D. Callelle

Time Allowed: 3 hours

Note: One textbook, design log books and assignments are permitted.
Answer all Questions.
All Questions are of equal value.

1. Our electronics company is extremely interested in designing a system for a large cattle producer. This producer would like to have a fully automatic system for feeding his cattle. As each cow approaches a feeding station, the cow is automatically identified, weighed and provided a mixture of feed that is unique for each animal.

Prepare a list of questions (grouped under a logical sequence of headings) that you would take to your first meeting with this customer.

2. You have been provided with three solar cells from three different companies:

Company A a 10 cm x 10 cm Solar Cell

Company B a 10 cm x 20 cm Solar Cell

Company C a 10 cm x 30 cm Solar Cell

Prepare a Testing Plan for determining which Solar Cell is the most efficient. A Solar Cell can be considered to be a current source in parallel with a resistance, where I_{MAX} is directly proportional to the incident radiation.

3. Your High School is having a Distinguished Graduate Seminar and you have been invited to participate as one of the speakers. You have been asked to give an illustrated presentation of approximately five minutes, to an audience of High School students, on the topic of "Crossovers in Stereo Music Systems". Your contact within the High School is particularly concerned that the students leave your presentation with an understanding of why a crossover is needed, where a crossover fits within the overall stereo system, and how a crossover works.

Prepare a draft outline for your presentation, including sketches of your visual aids (a maximum of three slides are allowed).

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4. Park-O-Matic Corporation is currently developing a consumer product that assists the consumer in the process of parking their vehicle in their home garage. The product, codenamed ParkBark, is designed to emit a warning to the consumer, in the form of a barking sound, when the front end of the vehicle reaches a fixed distance from the wall directly ahead of the vehicle.

The consumer is expected to stop their vehicle when the ParkBark starts to emit the warning sound. However, the consumer may decide to ignore the initial warnings. If the consumer continues to move ahead, the warning signal from the ParkBark increases in intensity and apparent ferocity until the consumer stops their vehicle or the ParkBark control unit has been destroyed by impact with the consumer vehicle.

You have been contracted to produce the Vehicle Position Sensor for the ParkBark product. As part of the customer review process, you have been asked to submit three different implementation concepts that could be used to satisfy the vehicle sensor requirements. You are required to submit enough detail about each implementation concept to convince the customer that each concept is technically feasible.

Your customer strongly values clarity and legibility and encourages the use of diagrams.

Prepare a draft of your parking sensor conceptual options submission.

The End