

Test-1a Your Understanding

Event Structure:

Participants will work in teams of three. The event will be 40 minutes long. One answer sheet will be returned per team. The exam may also involve a hands-on circuit component which participants will be required to build and analyze a circuit to answer questions.

Description:

The participants will be given a paper quiz consisting of a variety of question formats, including but not limited to:

- Multiple Choice
- True/False
- Short Free Response

The participants will be allowed to use a simple calculator (not programmable) to assist in the solving of some problems. The knowledge test will test the participants' basic knowledge in fundamental electrical engineering concepts, as well as require a high level of analytic skills to answer some of the free response questions.

The participants will also be given a number of circuit components (resistors, capacitors etc.) and will be asked to build a circuit to carry out a particular function or solve a particular problem.

Topics and Preparation:

Participants should be comfortable working with the following topics:

- Circuit Design and Analysis
- Calculating resistances, voltages, currents, capacitances, etc. (Ohm's law, Kirchoff's current equations, RC delay)
- Understanding concepts about currents, voltages, resistances, diodes, transistors, operational amplifiers etc.
- Boolean Logic and Logic gates
- Basic Optical Principles
- AM/FM Radio and general signal processing
- Data compression and encodings
- Fourier Transform and Fourier Series
- System Design

Sample Problems:

- 1) Given the circuit diagram above, what is the resistance across the element labeled A?

(multiple choice)

- 2) Given a set of logic gates, state the Boolean function represented on the output of the circuit
- 3) Briefly explain the function of a Low Pass Filter. (Free Response)

Contact:

This event is designed by Sam Payne (email contact: spayne@princeton.edu).

All email inquiries about the event should have the subject line: "PEO Event Inquiry – General Knowledge ELE Quiz"