

Halton Skills Competition

April 5, 2016, Robert Bateman High School

Electronics

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Purpose of Competition

The purpose of this competition is to provide competitors with the opportunity to demonstrate skills in engineering, science, and technology through a series of challenges involving theory, electrical measurement, bread-boarding, soldering and assembly and engineering. This contest will recognize outstanding students for excellence and professionalism in the field of Electronics Technology. Gold medal finalists are eligible to compete at the Ontario Skills Competitions May 2 – 4 2016 in Waterloo.

Tools and Equipment

Soldering stations, tools and multimeters will be available but competitors are encouraged to bring their own tools and meters due to variances in design. Competitors must bring an oscilloscope. The use of laptops and smart phones during the competition is prohibited. All necessary reference material will be provided. Students must dress in a professional manner, ie. slacks and shirt and wear safety glasses during the practical challenges.

Please bring:

- calculator (programmable calculators may be reset at the discretion of the judges)
- oscilloscope
- pencils
- resume
- suggested: multimeter, wire stripper, needle nose plier, side cutter, “Third hand” with magnifying glass.

Skills and Knowledge

The contest will cover the theoretical and practical aspects of current state of the art electronic industry standards. The competitor may be asked to demonstrate abilities in the following areas:

- Interpret electronic schematic diagrams, pictorials, manufacturers’ technical specifications and suppliers’ catalogs.
- Identify common electrical and electronic components.
- Construct, analyze and troubleshoot DC circuits including series resistance, parallel resistance, series-parallel resistance and solid state switching circuits.
- Construct, analyze and troubleshoot digital circuits including TTL/CMOS gates, timers, counters and optical devices.
- Hand-solder through-hole mount components on a printed circuit board to acceptable industry standards.
- Hand-desolder through-hole mount components on a printed circuit board.
- Set-up and demonstrate use of common electronic measuring and test equipment including multimeters, logic probes, power supplies, frequency generators and oscilloscopes.
- Troubleshoot simple electronic circuits having a preinstalled fault.
- Troubleshoot simple electronic circuits based on voltage and/or current and/or resistance readings given.
- Reverse engineer a simple electronic circuit.

Judging Criteria

Engineering 50 (Design and build a circuit board)

Theory 20 (Multiple choice and problem solving)

Reverse Engineering 15 (Draw a schematic based on a photo)

Cable Assembly 10 (RJ45 onto cat. 5)

Job Interview 5

Total 100

To assist competitors in preparing for their eventual job searches there is a “job interview” incorporated into this contest. It is expected that the competitors will arrive WITH A RÉSUMÉ and be prepared for interview questions and discussion. Performance in the interview accounts for 5% of the individual’s/team’s overall mark. Sample interview questions and a scoring breakdown are available at www.skillsontario.com/hr.

In the case of a tie the length of time taken to complete the Printed Circuit Board Assembly will be used as a tie breaker.

Agenda

8 am Orientation

8:30 am Theory Test

9:30 PC Board Assembly starts

TBD Lunch, 30 minutes.

TBD Job Interview

1:30 pm Work stops.

Judging will occur throughout the day. The instructions may ask the competitor to demonstrate a measurement or observation to the judges and judges may ask questions and evaluate portions of the work ongoing.