



SKILLS CANADA PEI PROVINCIAL COMPETITION

SCOPE DOCUMENT	
Competition Date	March 9, 2017
Competition location	Westisle Composite High School Room 515/516
Trade Number	16
Trade Name	Electronics
Level	Secondary

1. INTRODUCTION

1.1 Purpose of the Challenge.

To recognize students professionalism and excellence in the field of electronic technology; to evaluate each contestant's work place skills and their level of readiness for employment in the electronics industry.

1.2 Duration of contest.

6 Hours

8:30 – 9:30	Theory Test
9:35 – 10:10	Electronic Documentation
10:30 – 11:15	Fault Finding
11:15 – 12:00pm	Project Costing
12:45 – 2:00	Prototyping
2:15 – 3:30	Assembly Project

1.3 Skills and Knowledge to be tested.

Basic Electronic Principals, components, circuitry

2. CONTEST DESCRIPTION

1.0 Theory

A question sheet will be supplied. The competitor will show all answers and calculations on this sheet. This is a timed competition; all contestants must stop writing when the allotted time has expired.

Questions will encompass some or all of the topics below:



SKILLS CANADA PEI PROVINCIAL COMPETITION

Basic Electronic Principals:

- Resistors
- Resistor Networks
- RC Time Constants
- LRC Circuit Calculations
- Basic AC and DC Theory

Electronic Components

The properties, characteristics and application (in elementary circuits) of the following components (both in fixed and variable forms).

- Resistors
- Capacitors
- Coils, Transformers
- Diodes (Rectifier, Zener, Light Emitting, Capacitive)
- Transistors (Bipolar, FET & Unijunction)
- Thyristors (SCR, Triac)

Amplifiers:

- Single stage amplifier characteristics, calculations and measurements of voltage and dB's
- Operational stage amplifier characteristics and calculations

Circuits:

- Comparitors
- Sine wave oscillators (RC, Quartz, LC)
- Differentiator
- Integrator

Digital Electronics:

- Basic logic gates (AND, NOT, OR, NAND, NOR, XOR) and their truth tables
- Analyzing logic circuits with basic logic gates and creating their truth tables
- Synthesising logic gates with other logic gates (E.G.: substitute two NAND for

AND)

- Digital wave from analysis
- Simplify logic circuits using Boolean Algebra or Karnaugh Mapping
- Latches and Flip – Flops
- Shift Register, Counter and Divider circuits



SKILLS CANADA PEI PROVINCIAL COMPETITION

2.0 Electronic Documentation

Interpretation of **Electronic Documentation** will be examined by the competitor's ability to answer questions based on supplied documentation. Understanding and comprehension will be evaluated.

The ability of a competitor to generate documentation suitable for troubleshooting will be evaluated by having the competitor's sketch a comprehensive schematic from a supplied **circuit board**.

3.0 Rework Technique

The competitor's ability to troubleshoot electronic equipment will be evaluated. Pre-built circuits will be provided, and each board will have a fault pre-installed. Each competitor will be asked to troubleshoot one such circuit. The ability to fault find, locate and mathematically prove the defective component or wiring will be evaluated.

4.0 Project Costing

The competitor will locate component part numbers and price.

5.0 Prototyping

To evaluate the competitors ability to build and make operational, a simple electronic design. This portion of the competition will require that a circuit's design be finalized, built and tested. A suitable supply of parts will be provided. Not all parts will be needed to be used.

6.0 Assembly Project

Hands on skills, work practices and abilities to follow instructions will be evaluated during the assembly of an electronic kit. The construction of this kit may include all skills relevant to such an activity, i.e. soldering, wiring, crimping, wires wrapping, drilling, punching, gluing, etc.

3. ESSENTIAL SKILLS

Essential skills are used in nearly every job and at different levels of complexity. They provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change. Good Essential Skills means you will understand and remember concepts introduced in technical training. The level of Essential Skills required for most trades is as high or higher than it is for many office jobs.



SKILLS CANADA PEI PROVINCIAL COMPETITION

4. EQUIPMENT, MATERIAL, CLOTHING

4.1 Each competitor will bring the following:

- Calculator
- Pen, pencil, eraser and ruler
- Safety glasses

4.2 Equipment and material provided by the competition site

- Question and Answer forms
- VOM
- Wire
- Data Sheets for all active components
- Oscilloscope
- Signal Generator
- Digital Multimeter
- Dual Power Supply
- Electronic Components
- Breadboard
- All Specialty Tools (wire – wrap, etc.)
- Hand tools (soldering iron, pliers, cutters, screwdrivers, solder, solder removing tool, awl, knife)

Tools other than those supplied or listed on this scope document are not permitted

5. SAFETY REQUIREMENTS

5.1 List of required personal protective equipment(PPE) provided by competitors

Safety awareness/requirements will be maintained at, at least minimum industry standards at all times. A contestant will not be allowed to compete without the safety equipment noted on this scope document.

- Safety glasses, shoes (covered footwear), pants (covered legs)
- No jewellery on hands or wrists

Note: Competitors will not be allowed to compete if the above items are not brought and used



SKILLS CANADA PEI PROVINCIAL COMPETITION

6. ASSESSMENT

6.1 Point breakdown

The judges will not confer amongst themselves during the marking.

The judges may question competitors during the marking.

The judges will individually score each competitor's project with a maximum mark of 10.

Each competitor's competition section will be timed when they finish. In the event that there is a tie for placing, the competitor's finish time will be factored in.

Marks:

Perfect	(Above every standard)	10
Very Good	(Meets every standard)	9
Good	(Acceptable overall, many good points)	8
Rather Good	(Acceptable overall, some good points)	7
Sufficient	(Acceptable overall)	6
Medium	(Barely Acceptable overall)	5
Weak	(Meets some standards)	4
Insufficient	(Close to some standards)	3
Very Bad	(Nominal attempt at standards)	2
Zero	(Zero standards met)	1

POINT BREAKDOWN	/100
Theory	20
Documentation	10
Rework Technique	15
Project Costing	15
Prototyping	20
Assembly Project	20

7. ADDITIONAL INFORMATION

7.1 Tie (No ties are allowed)

In the event that there is a tie for placing, the competitors finish time will be factored in.

7.2 Competition rules

Please refer to the competition rules for all general PSC information.



SKILLS CANADA PEI PROVINCIAL COMPETITION

8. CONTACT INFORMATION

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