

Apprenticeship and Certification Study Guide



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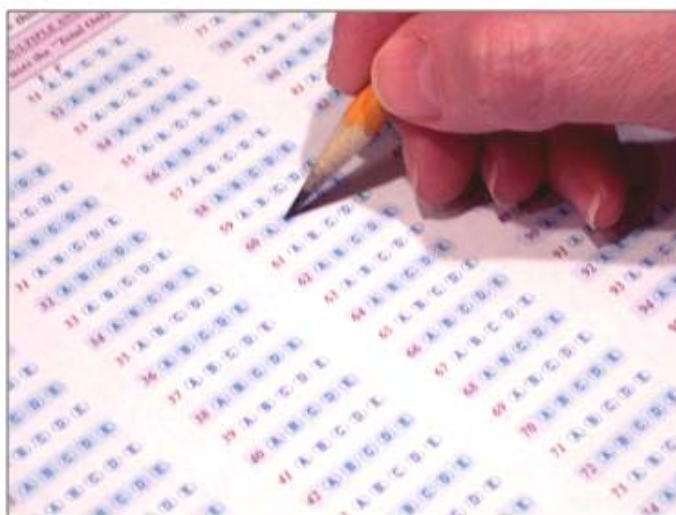
Introduction

This Study Guide has been developed by the Newfoundland and Labrador Department of Education and Early Childhood Development, Apprenticeship and Trades Certification Division, to assist apprentices and trade qualifiers as they prepare to write the Red Seal Exam. Red Seal Exams are available for all Red Seal trades. For a list of Red Seal trades please refer to the Department of Education and Early Childhood Development website: <https://www.gov.nl.ca/atcd/designated-trades/list-of-designated-trades/>

Some of the specific goals of this guide are:

- ⇒ to help you understand the skills and knowledge that might be covered on the exam
- ⇒ to help you identify your strengths and weaknesses
- ⇒ to provide organization and structure for a course of study
- ⇒ to provide a list of resources to help you with your study plan
- ⇒ to support and supplement the teaching and learning process

This study guide outlines the theoretical portion of the program. The intent is not to replace technical training provided under the guidance of instructors. Rather, it is a tool to be used in conjunction with formal training.



Exam Process

Before the Exam

You must contact the nearest Apprenticeship and Trades Certification Divisional office to make request to write the Red Seal exam (*See Appendix A for a list of regional offices*). Upon approval, the Apprenticeship Program Officer (APO) will notify you of your eligibility to write the exam, and provide you with scheduling information. If you require special accommodations due to a disability or language barrier, please contact your regional office for information on applying for this service.

During the Exam

You must bring:

- ☐ personal identification such as a photo or signature ID or valid Newfoundland and Labrador driver's license
- ☐ your notification letter

The following will be provided:

- ☐ a calculator (*see Appendix B for calculator information*)
- ☐ all other items required such as pencils, scrap paper, etc.

Important Note:

Personal cell phones, calculators, or other electronic equipment are NOT allowed into the exam room. If you do bring them, they will be stored away and returned to you when you have completed the exam.

After the Exam

Results will be mailed to you approximately seven to ten days after completion of the exam. All necessary instructions and information will be provided in the results letter.

The percentage mark you obtained will be provided. You will also be given a section by section breakdown, showing how many questions were in each section, as well as the number of questions in each section you completed successfully.

If you are successful in obtaining a 70% or more on your exam, you will be issued a Newfoundland and Labrador Certificate of Qualification with a Red Seal endorsement.

Exam Format

All Red Seal exams are written in multiple-choice format. Each exam has between 100 and 150 questions. A multiple choice question consists of a stem (a complete question) followed by four options (A, B, C, D). The stem contains all the information necessary to answer the question. The options consist of the one correct answer and three “distracters.” Distracters are incorrect. (See Appendix C for a sample answer sheet).

Red Seal exams contain three types of questions:

Level 1 Knowledge and Recall

Questions at this level test your ability to recall and understand definitions, facts, and principles.

Level 2 Procedural and Application

Questions at this level test your ability to apply your knowledge of procedures to a new situation.

Level 3 Critical Thinking

Questions at this level test your ability to interpret data, solve problems and arrive at valid conclusions.

Level 1 Examples:

1. What does a dashed line between 2 disconnects indicate on a schematic diagram?
 - A. Mechanical interlock.
 - B. Bonding conductor.
 - C. Ground connection.
 - D. Lightning arrester.



2. What do the letters "HRC" on a fuse indicate?

- A. High running current.
- B. Half running capacity.
- C. Half rupture current.
- D. High rupture capacity.



3. When checked with an ohmmeter, a capacitor reads 0 Ω. What is the capacitor's condition?

- A. Open-circuited.
- B. Short-circuited.
- C. Grounded.
- D. Serviceable.



Level 2 Examples:

1. What is the procedure for testing a high pressure sodium (HPS) lamp socket for power?

- A. Use digital VOM to check from centre contact to ground.
- B. Use digital VOM to check from shell to centre contact.
- C. Use analog VOM to check from centre contact to ground.
- D. Use analog VOM to check from shell to centre contact.



2. In addition to wearing safety boots, which combination of personal protective equipment is utilized when working at a switching substation?
- A. Work gloves, anti-glare safety goggles and glow stick.
 - B. Work gloves, face shield and ear plugs.
 - C. Safety gloves, face shield and glow stick.
 - D. Safety gloves, safety goggles and ear plugs.



3. A three-phase delta connected load is single-phasing because of an open winding. What percentage of its original load could be delivered?
- A. 33.30%.
 - B. 50.00%.
 - C. 66.70%.
 - D. 72.30%.



Level 3 Examples:

1. A shop has 6 rows of lighting, each with 42 fixtures. During a lighting retrofit it takes 2 electricians 70 minutes to change 1 fixture. How many electricians are required to change all of the fixtures in a 40 hour time period?
- A. 3.
 - B. 8.
 - C. 13.
 - D. 15.



2. What is the minimum size of TW90 copper conductors required to feed a 230V, 5 hp, single-phase motor located 60 m from the distributor centre, without exceeding a 3% voltage drop?

- A. No. 4 AWG.
- B. No. 6 AWG.
- C. No. 8 AWG.
- D. No. 10 AWG.



3. A -10 V to +10 V temperature transmitter is calibrated to measure from -50°C to +300°. At a temperature of +76°C, what is the expected voltage output from the transmitter?

- A. -3.6 V.
- B. -2.8 V.
- C. +2.5 V.
- D. +4.3 V.



Source of questions:

<http://www.red-seal.ca/s.1mpl.2.2x.1mQ.5.2st.3.4ns-eng.html?tid=123#>

Exam Content

Understanding the *Red Seal Occupational Standard (RSOS)*

The Red Seal model has historically been based on the development of the National Occupational Analysis (NOA) which supports the development of multiple-choice format examinations.

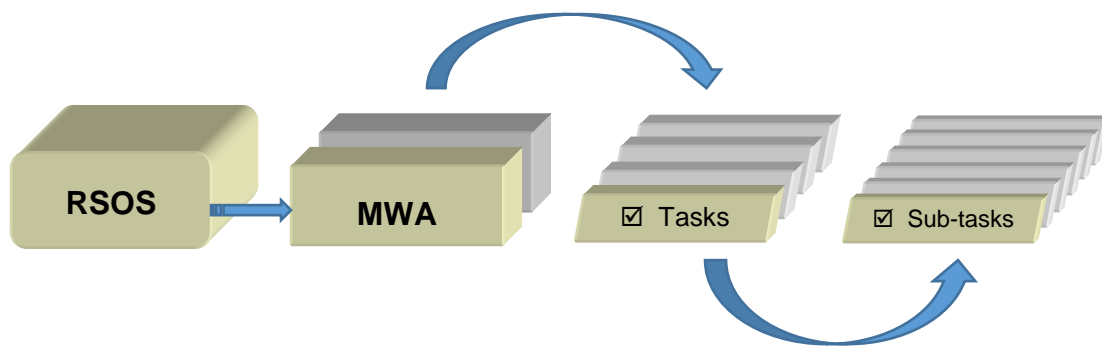
The RSOS was introduced in 2015 and is now taking the place of the NOA. Each RSOS or NOA sets the standard for a Red Seal trade. The Red Seal Examination is based on the Red Seal Standard.

The new standards provide greater consistency in learning resources and allow for increased industry involvement in the development of these standards. This new model places increases emphasis on apprenticeship training and assessing skills with industry learning objectives, outcomes and performance criteria.

The RSOS for each trade describes the tasks and sub-tasks; skills and knowledge requirements; summary of essential skills; safety information; trends affecting the trade; technical terms; names of tools and equipment; acronyms; learning objectives and outcomes; industry expected performance and essential skills related to each sub-task.

The RSOS is an excellent tool to use as you study for the Red Seal exam. RSOSs can be found at <http://www.red-seal.ca/resources/n.4.1-eng.html>

RSOS material is organized into the following categories: **MWA (Major Working Activity)**. The MWAs are further broken down into **TASKS** (*describes activities within an MWA*) and **SUB-TASKS** (*describe activities within a task – This is what the exam is based on*).

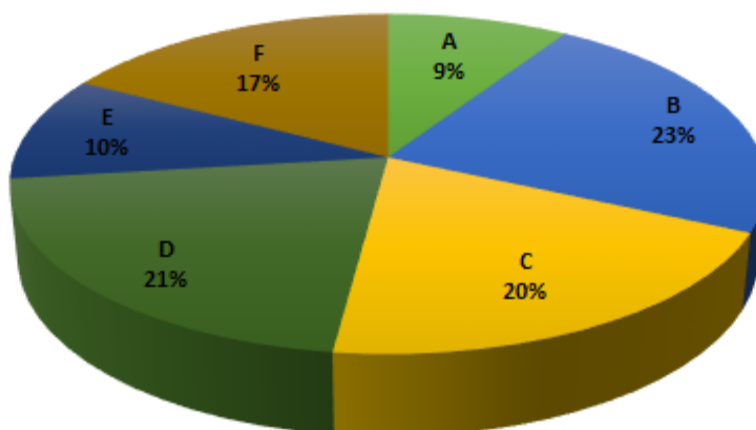


The NOA will continue to be used as the occupational standard for trades that do not yet have an RSOS developed.

RSOS Pie Chart

The RSOS Pie Chart presents the MWA percentages in the form of a pie chart which tells you the approximate number of questions from each MWA. For example, 9% of the questions on the **Industrial Electrician** Exam will be based on **MWA A**.

INDUSTRIAL ELECTRICIAN



MWA Titles			
MWA A	Performs Common Occupational Skills	MWA D	Installs and Maintains Rotating and Other Fixed Equipment and Control Systems
MWA B	Installs and Maintains Generating, Distribution and Service Systems	MWA E	Installs and Maintains Signaling and Communication Systems
MWA C	Installs and Maintains Wiring Systems	MWA F	Installs and Maintains Process Control Systems

Exam Breakdown

The **Industrial Electrician** exam currently has 100 questions. The following table shows a breakdown of the number of questions that come from each RSOS MWA. It is important to note that the exact number of questions can change at any time. When you are ready to write your exam, you may contact your regional office to verify the number of questions (See Appendix A).

		# of Questions
MWA A	Performs Common Occupational Skills	9
Task 1	Performs safety-related functions	
Task 2	Uses tools and equipment	
Task 3	Organizes work	
Task 4	Fabricates and installs support components	
Task 5	Commissions and decommissions electrical systems	
Task 6	Uses communication and mentoring techniques	
MWA B	Installs and Maintains Generating, Transmission, Distribution and Service Systems	23
Task 7	Installs and maintains utility and non-utility supply services and metering equipment	
Task 8	Installs and maintains protection devices	
Task 9	Installs and maintains low voltage distribution systems	
Task 10	Installs and maintains power conditioning systems	
Task 11	Installs and maintains bonding, grounding and ground fault protection and detection systems	
Task 12	Installs and maintains power generating and conversion systems	
Task 13	Installs and maintains renewable energy generating and energy storage systems	
Task 14	Installs and maintains high voltage systems	
Task 15	Installs and maintains transformers	
MWA C	Installs and Maintains Wiring Systems	20
Task 16	Installs and maintains raceways, cables, conductors and enclosures	
Task 17	Installs and maintains branch circuitry and devices	
Task 18	Installs and maintains heating, ventilation and air-conditioning (HVAC) electrical components	
Task 19	Installs and maintains electric heating systems and controls	
Task 20	Installs and maintains exit and emergency lighting systems	
Task 21	Installs and maintains cathodic protection systems	
MWA D	Installs and Maintains Rotating and Other Fixed Equipment and Control Systems	21
Task 22	Installs and maintains motor starters and control devices	
Task 23	Installs and maintains drives	
Task 24	Installs and maintains other fixed equipment and associated controls	
Task 25	Installs and maintains motors	
MWA E	Installs and Maintains Signaling and Communication Systems	10
Task 26	Installs and maintains signaling systems	
Task 27	Installs and maintains communication systems	
Task 28	Installs and maintains building automation systems	
MWA F	Installs and Maintains Process Control Systems	17
Task 29	Installs and maintains input/output (I/O) devices	
Task 30	Installs, programs and maintains automated control systems	
Task 31	Installs and maintains pneumatic and hydraulic control systems	
	Total	100

RSOS Sub-tasks

The following *RSOS Task Profile Checklist* outlines the MWAs, tasks and sub-tasks for your trade. The Red Seal exam is written to test your knowledge and abilities regarding the sub-tasks in the RSOS. This chart can be used to review your current knowledge. You can review by placing a check mark (✓) next to those you understand fully.

Place your focus on those you do not understand and study them until you are comfortable with the material. Think of possible questions in that particular content area.

The RSOS also contains a list of “supporting knowledge and abilities” for each sub-task. They are the skills and knowledge you must have to perform a sub-task. The supporting knowledge and abilities identified under each sub-task will be very helpful as you review. The list can be found in the RSOS, on the Red Seal website, for your trade.

**Task Profile Checklist
Based on RSOS 2021
Industrial Electrician**

MWA A: Performs Common Occupational Skills

☐ **Task 1: Performs safety-related functions**

- Sub-Tasks**
- ☐ Maintains safe work environment
 - ☐ Uses personal protective equipment (PPE) and safety equipment
 - ☐ Performs lock-out and tag-out procedures
 - ☐ Identifies environmental conditions

☐ **Task 2: Uses tools and equipment**

- Sub-Tasks**
- ☐ Uses common and specialty tools and equipment
 - ☐ Uses access equipment
 - ☐ Uses rigging, hoisting and lifting equipment

☐ **Task 3: Organizes work**

- Sub-Tasks**
- ☐ Interprets plans, drawings and specifications
 - ☐ Identifies hazardous installations
 - ☐ Organizes materials and supplies
 - ☐ Plans project tasks and procedures
 - ☐ Prepares specific location in facility
 - ☐ Finalizes required documentation

☐ **Task 4: Fabricates and installs support components**

- Sub-Tasks**
- ☐ Fabricates support structures
 - ☐ Installs brackets, hangers and fasteners
 - ☐ Installs seismic restraint systems

☐ **Task 5: Commissions and decommissions electrical systems**

- Sub-Tasks**
- ☐ Commissions systems
 - ☐ Performs shutdown and startup procedures
 - ☐ Decommissions systems

☐ **Task 6: Uses communication and mentoring techniques**

- Sub-Tasks**
- ☐ Uses communication techniques
 - ☐ Uses mentoring techniques

MWA B: Installs & Maintains Generating, Transmission, Distribution & Service Systems

- | | |
|--------------------------|---|
| <input type="checkbox"/> | Task 7: Installs and maintains utility and non-utility supply services and metering equipment |
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs single-phase utility and non-utility supply services and metering equipment<input type="checkbox"/> Maintains single-phase utility and non-utility supply services and metering equipment<input type="checkbox"/> Installs three-phase utility and non-utility supply services and metering equipment<input type="checkbox"/> Maintains three-phase utility and non-utility supply services and metering equipment |
| <input type="checkbox"/> | Task 8: Installs and maintains protection devices |
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs overcurrent protection devices<input type="checkbox"/> Maintains overcurrent protection devices<input type="checkbox"/> Installs ground fault, arc fault and surge protection devices<input type="checkbox"/> Maintains ground fault, arc fault and surge protection devices<input type="checkbox"/> Installs under and over voltage protection devices<input type="checkbox"/> Maintains under and over voltage protection devices |
| <input type="checkbox"/> | Task 9: Installs and maintains low voltage distribution systems |
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs low voltage distribution equipment<input type="checkbox"/> Maintains low voltage distribution equipment |
| <input type="checkbox"/> | Task 10: Installs and maintains power conditioning systems |
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs power conditioning systems<input type="checkbox"/> Maintains power conditioning systems |
| <input type="checkbox"/> | Task 11: Installs and maintains bonding, grounding and ground fault protection and detection systems |
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs grounding systems<input type="checkbox"/> Maintains grounding systems<input type="checkbox"/> Installs bonding systems<input type="checkbox"/> Maintains bonding systems<input type="checkbox"/> Installs ground fault protection and detection systems<input type="checkbox"/> Maintains ground fault protection and detection systems |
| <input type="checkbox"/> | Task 12: Installs and maintains power generating and conversion systems |
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs alternating current (AC) generating systems<input type="checkbox"/> Maintains alternating current (AC) generating systems<input type="checkbox"/> Installs direct current (DC) generating and conversion systems<input type="checkbox"/> Maintains direct current (DC) generating and conversion systems |
| <input type="checkbox"/> | Task 13: Installs and maintains renewable energy generating and energy storage systems |
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs renewable energy generating and energy storage systems<input type="checkbox"/> Maintains renewable energy generating and energy storage systems |
| <input type="checkbox"/> | Task 14: Installs and maintains high voltage systems |
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs high voltage systems<input type="checkbox"/> Maintains high voltage systems |
| <input type="checkbox"/> | Task 15: Installs and maintains transformers |
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs extra-low voltage transformers<input type="checkbox"/> Maintains extra-low voltage transformers<input type="checkbox"/> Installs low voltage single-phase transformers<input type="checkbox"/> Maintains low voltage single-phase transformers<input type="checkbox"/> Installs low voltage three-phase transformers<input type="checkbox"/> Maintains low voltage three-phase transformers<input type="checkbox"/> Installs high voltage transformers<input type="checkbox"/> Maintains high voltage transformers |

MWA C: Installs and Maintains Wiring Systems

☐ Task 16: Installs and maintains raceways, cables, conductors and enclosures

Sub-Tasks

- ☐ Installs conductors and cables
- ☐ Maintains conductors and cables
- ☐ Installs conduit, tubing and fittings
- ☐ Installs raceways
- ☐ Installs boxes and enclosures
- ☐ Maintains conduit, tubing, fittings, raceways, boxes and enclosures

☐ Task 17: Installs and maintains branch circuitry and devices

Sub-Tasks

- ☐ Installs luminaires
- ☐ Maintains luminaires
- ☐ Installs wiring devices
- ☐ Maintains wiring devices

☐ Task 18: Installs and maintains heating, ventilation and air-conditioning (HVAC) electrical components

Sub-Tasks

- ☐ Connects power to HVAC systems and associated equipment
- ☐ Installs HVAC controls
- ☐ Maintains HVAC electrical components

☐ Task 19: Installs and maintains electric heating systems and controls

Sub-Tasks

- ☐ Installs electric heating systems and controls
- ☐ Maintains electric heating systems and controls

☐ Task 20: Installs and maintains exit and emergency lighting systems

Sub-Tasks

- ☐ Installs exit and emergency lighting systems
- ☐ Maintains exit and emergency lighting systems

☐ Task 21: Installs and maintains cathodic protection systems

Sub-Tasks

- ☐ Installs cathodic protection systems
- ☐ Maintains cathodic protection systems

MWA D: Installs and Maintains Rotating and Other Fixed Equipment and Control Systems

☐ Task 22: Installs and maintains motor starters and control devices

- | | |
|------------------|---|
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs motor starters<input type="checkbox"/> Maintains motor starters<input type="checkbox"/> Installs motor control devices<input type="checkbox"/> Maintains motor control devices |
|------------------|---|

☐ Task 23: Installs and maintains drives

- | | |
|------------------|---|
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs AC drives<input type="checkbox"/> Maintains AC drives<input type="checkbox"/> Installs DC drives<input type="checkbox"/> Maintains DC drives |
|------------------|---|

☐ Task 24: Installs and maintains other fixed equipment and associated controls

- | | |
|------------------|--|
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs other fixed equipment and associated controls<input type="checkbox"/> Maintains other fixed equipment and associated controls |
|------------------|--|

☐ Task 25: Installs and maintains motors

- | | |
|------------------|--|
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs single-phase motors<input type="checkbox"/> Maintains single-phase motors<input type="checkbox"/> Installs three-phase motors<input type="checkbox"/> Maintains three-phase motors<input type="checkbox"/> Installs direct current (DC) motors<input type="checkbox"/> Maintains direct current (DC) motors |
|------------------|--|

MWA E: Installs and Maintains Signaling and Communication Systems

☐ Task 26: Installs and maintains signaling systems

- | | |
|------------------|---|
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs fire alarm systems<input type="checkbox"/> Maintains fire alarm systems<input type="checkbox"/> Installs security and surveillance systems<input type="checkbox"/> Maintains security and surveillance systems |
|------------------|---|

☐ Task 27: Installs and maintains communication systems

- | | |
|------------------|--|
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs communication systems<input type="checkbox"/> Maintains communication systems |
|------------------|--|

☐ Task 28: installs and maintains building automation systems

- | | |
|------------------|--|
| Sub-Tasks | <ul style="list-style-type: none"><input type="checkbox"/> Installs building automation systems<input type="checkbox"/> Maintains building automation systems |
|------------------|--|

MWA F: Installs and Maintains Process Control Systems

☐ Task 29: Installs and maintains input/output (I/O) devices

Sub-Tasks

- ☐ Installs discrete input/output (I/O) devices
- ☐ Maintains discrete input/output (I/O) devices
- ☐ Installs analog input/output (I/O) devices
- ☐ Maintains analog input/output (I/O) devices

☐ Task 30: Installs, programs and maintains automated control systems

Sub-Tasks

- ☐ Installs automated control systems
- ☐ Maintains automated control systems
- ☐ Programs automated control systems
- ☐ Optimizes system performance

☐ Task 31: Installs and maintains pneumatic and hydraulic control systems

Sub-Tasks

- ☐ Installs pneumatic control systems
- ☐ Maintains pneumatic control systems
- ☐ Installs hydraulic control systems
- ☐ Maintains hydraulic control systems

Create a Study Plan

As you prepare for your exam, it is important to plan a schedule. The following two tables will help you stay on track.

The first table is a **“Weekly Study Plan.”** In this table list the areas you will focus your study for each day. You should include items you need to review as well as items you need to study. Remember, more time will be needed for study in areas you find difficult, whereas you may only require review in areas you are more familiar with. As you work through the RSOS sub-task list you can start to fill in this table.

The second table is a **“Study Time Table.”** It is important to create a study schedule where you determine the best days of the week and times of day for you to study.

Print several copies of these tables and fill out for each week of study. It is important to stick to your study schedule.

Weekly Study Plan for Week of: _____

	Area of Study 1	Area of Study 2	Area of Study 3	Area of Study 4	Area of Study 5	Area of Study 6
Mon.						
Tues.						
Wed.						
Thu.						
Fri.						
Sat.						
Sun.						

Study Time Table for Week of: _____

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8:00 AM - 9:00 AM							
9:00 AM - 10:00 AM							
10:00 AM - 11:00 AM							
11:00 AM - 12:00 Noon							
12:00 Noon - 1:00 PM							
1:00 PM - 2:00 PM							
2:00 PM - 3:00 PM							
3:00 PM - 4:00 PM							
4:00 PM - 5:00 PM							
5:00 PM - 6:00 PM							
6:00 PM - 7:00 PM							
7:00 PM - 8:00 PM							

Resources - Websites

Study information can be drawn from a variety of sources. A sample list of study materials (websites and books) is provided below. These and other helpful resources may be found in a local college bookstore, on the Internet, or at your place of employment. You may also be able to borrow them from an apprentice or journey person in your trade.

Study Strategies and Exam Preparation Guide

The *Study Strategies & Exam Preparation Guide* is meant to be used in conjunction with this study guide. It provides direction and information on such areas as study habits, test preparation and test taking techniques.

<https://www.gov.nl.ca/atcd/apprentices-youth/self-study/study-guides/>

Plan of Training (POT)

A *Provincial Plan of Training* details the full scope of learning for a particular occupation, including both technical training competencies and industry experiences necessary to write a Red Seal exam (and complete the requirements for Red Seal Certification), or to write a provincial examination. The POT is based on the RSOS.

<https://www.gov.nl.ca/atcd/designated-trades/pots-aacs/>

Red Seal Website

Red Seal is a program that sets common standards to evaluate the skills of tradespeople across Canada. It is a partnership between the Federal Government and the provinces/territories.

The Red Seal model has been based on the National Occupational Analyses (NOA) which supports the development of multiple-choice examinations. A new Red Seal Occupational Standard (RSOS) was introduced in 2015 and is taking the place of the NOA.

<http://www.red-seal.ca/>

Industrial Electrician PRACTICE Exam

This is **NOT** a Red Seal exam. This is a practice exam provided by the Red Seal Standards program. It was developed using similar question types to that of a Red Seal exam. The exam is intended to be used for self-assessment in preparation for writing a Red Seal Exam.

<http://www.red-seal.ca/s.1mpl.2.2x.1mQ.5.2st.3.4ns-eng.html?tid=123>

Red Seal Exam Self-Assessment Guide

Use this self-assessment tool to rate your own understanding and experience with the tasks of the trade that are on the Red Seal examination:

https://www.red-seal.ca/_conf/assets/custom/docms/industrialelectric/self-assessment.pdf

Acronyms

The Red Seal website lists Acronyms which will be helpful in preparing for your Red Seal exam:

<https://www.red-seal.ca/eng/trades/industrialelectric/app-a.shtml>

Tools and Equipment

The Red Seal website lists Tools and Equipment which will be helpful in preparing for your Red Seal exam:

<https://www.red-seal.ca/eng/trades/industrialelectric/app-b.shtml>

Glossary

The Red Seal website shows a Glossary list which can help in preparing for your Red Seal exam:

<https://www.red-seal.ca/eng/trades/industrialelectric/app-c.shtml>

Resources – Book List

The books listed below can help you obtain information on specific topics. It is not necessary to use these books specifically, as you may find others that will be equally beneficial.

If you wish to obtain any of the resources listed above, here is the reference information:

- ☐ *Canadian Electrical Code*, Canadian Standards Association, 2009, ISBN 1553246926
- ☐ *Delmar's Standard Textbook of Electricity*, 4th Edition, Herman, Stephen L.
ISBN 1418065803
- ☐ *Electrical Motors Controls for Integrated Systems*, 3rd Edition, Rockis, Gary J. Mazur. Glen A,
ISBN 0826912079
- ☐ *Electrical Motors Controls for Integrated Systems (workbook)*, 3rd Edition,
ISBN 0826912084
- ☐ *Electrical Wiring Commercial*, 5th Canadian Edition, Filice, Maltese, Marchetti, Mullin, Millerand Miller,
ISBN 0176502165
- ☐ *Electrical Wiring Industrial*, 3rd Canadian Edition, Branch, Granelli, Herman, Miller, Smith, and
Stephenson, ISBN 0176502149
- ☐ *Electrical Wiring Residential*, 5th Edition, Branch, Miller, Mullin, Stephenson, Todd, and Trineer, ISBN
0176502157
- ☐ *Industrial Motor Control*, 5th Edition, Herman, Stephen L, ISBN 1401838022
- ☐ *IPT's Crane and Rigging Handbook*, 4th Edition, Garby, Roland G, ISBN 0920855016
- ☐ *IPT's Electrical Handbook*, 4TH Edition, Putz, Herb, ISBN 0920855229
- ☐ *IPT's Safety First Handbook*, 3rd Edition, Basaraba, Bruce M, ISBN 02920855342

Disclaimer

Various external resources (websites, textbooks) have been listed in this study guide to assist an individual in preparing to write a Red Seal Exam. This does not mean the Department of Education and Early Childhood Development, Newfoundland and Labrador endorses the material or that these are recommended as the best resources. There may be other resources of equal or greater value to an individual preparing for a Red Seal exam. The Department of Education and Early Childhood Development has no control over the content of external textbooks and websites listed, and no responsibility is assumed for the accuracy of the material.

Conclusion

We hope this guide has provided you with some useful tools as you prepare for your Red Seal exam. If you have any questions regarding your Red Seal exam please contact your regional office (*see Appendix A for a list of regional offices*).

We appreciate your comments and feedback regarding the usefulness of this study guide. If you have any comments or suggestions, we welcome your feedback. The feedback form at the end of this guide can be used for this purpose.

Appendix A: Regional Offices

If you have any questions regarding your Red Seal exam, please contact one of the following regional offices:

Department of Education and Early Childhood Development
Apprenticeship and Trades Certification Division
Toll Free: 1-877-771-3737

<https://www.gov.nl.ca/atcd/contact-us/staff-listing-and-office-locations/>

Corner Brook

1-3 Union Street
Aylward Building, 2nd Floor
Corner Brook, NL A2H 5M7

Telephone: (709) 637-2366
Facsimile: (709) 637-2519

Grand Falls-Windsor

42 Hardy Avenue
Grand Falls-Windsor, NL
A2A 2J9

Telephone: (709) 292-4215
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Happy Valley – Goose Bay

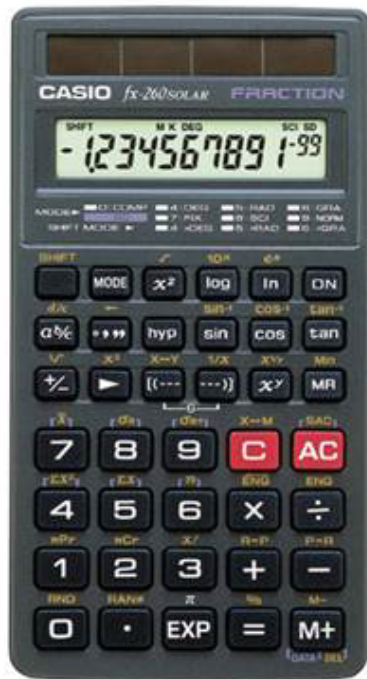
163 Hamilton River Road
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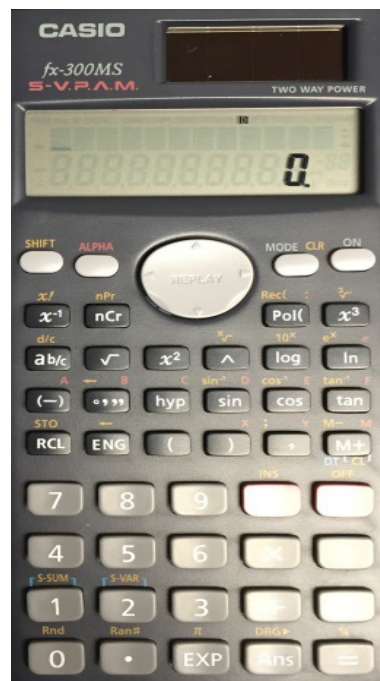
Appendix B: Calculator Use

The picture below shows a calculator with the same functions as the one you will be provided with during your exam. It is advisable to borrow or purchase one with similar functions so that you can familiarize yourself with it before you write your exam.

Casio FX-260



Casio FX-300 MS



Appendix C: Answer Sheet Example

With your exam you will be given an answer sheet similar to the one below. When answering multiple choice questions be sure to fill the circle completely and fill the circle that corresponds to the question on the exam.

Dual readhead scanner ☒ required ☐ to score this sheet

KEY ID
A B C D

SCORING & PRINTING OPTIONS:
☐ RESCORE ☐ MULTIPLE ANSWER SCORING
 This sheet always uses the "Total Only" scoring option.

1 T F 1 A B C D E 26 T F 26 A B C D E 51 T F 51 A B C D E 76 T F 76 A B C D E
 2 A B C D E 27 A B C D E 52 A B C D E 77 A B C D E
 3 A B C D E 28 A B C D E 53 A B C D E 78 A B C D E
 4 A B C D E 29 A B C D E 54 A B C D E 79 A B C D E
 5 A B C D E 30 A B C D E 55 A B C D E 80 A B C D E
 6 A B C D E 31 A B C D E 56 A B C D E 81 A B C D E
 7 A B C D E 32 A B C D E 57 A B C D E 82 A B C D E
 8 A B C D E 33 A B C D E 58 A B C D E 83 A B C D E
 9 A B C D E 34 A B C D E 59 A B C D E 84 A B C D E
 10 A B C D E 35 A B C D E 60 A B C D E 85 A B C D E
 11 A B C D E 36 A B C D E 61 A B C D E 86 A B C D E
 12 A B C D E 37 A B C D E 62 A B C D E 87 A B C D E
 13 A B C D E 38 A B C D E 63 A B C D E 88 A B C D E
 14 A B C D E 39 A B C D E 64 A B C D E 89 A B C D E
 15 A B C D E 40 A B C D E 65 A B C D E 90 A B C D E
 16 A B C D E 41 A B C D E 66 A B C D E 91 A B C D E
 17 A B C D E 42 A B C D E 67 A B C D E 92 A B C D E
 18 A B C D E 43 A B C D E 68 A B C D E 93 A B C D E
 19 A B C D E 44 A B C D E 69 A B C D E 94 A B C D E
 20 A B C D E 45 A B C D E 70 A B C D E 95 A B C D E
 21 A B C D E 46 A B C D E 71 A B C D E 96 A B C D E
 22 A B C D E 47 A B C D E 72 A B C D E 97 A B C D E
 23 A B C D E 48 A B C D E 73 A B C D E 98 A B C D E
 24 A B C D E 49 A B C D E 74 A B C D E 99 A B C D E
 25 A B C D E 50 A B C D E 75 A B C D E 100 A B C D E

ANSWER KEY INFO.
 # OF KEYS
 ITEM COUNT
 0 0 0 0 2
 1 1 1 1 3
 2 2 2 2 4
 3 3 3 3 5
 4 4 4 4 6
 5 5 5 5 7
 6 6 6 6 8
 7 7 7 7 9
 8 8 8 8 0
 9 9 9 9 1

PERFORMANCE ASSESSMENT
 % OF TOTAL SCORE
 POINTS EARNED
 00 = 100%
 0 0 0 0 0
 1 1 1 1 1
 2 2 2 2 2
 3 3 3 3 3
 4 4 4 4 4
 5 5 5 5 5
 6 6 6 6 6
 7 7 7 7 7
 8 8 8 8 8
 9 9 9 9 9

NUMBER CORRECT
PERCENT CORRECT
ROSTER NUMBER
SCORE
RESCORE

COMBINED POINTS EARNED
COMBINED PERCENT CORRECT
LETTER GRADE
SCORE
RESCORE

200 ITEM

MARKING INSTRUCTIONS
 Use a No. 2 Pencil
 Fill oval completely
 Erase cleanly

STUDENT ID NUMBER
 0 0 0 0 0 0 0 0 0 0
 1 1 1 1 1 1 1 1 1 1
 2 2 2 2 2 2 2 2 2 2
 3 3 3 3 3 3 3 3 3 3
 4 4 4 4 4 4 4 4 4 4
 5 5 5 5 5 5 5 5 5 5
 6 6 6 6 6 6 6 6 6 6
 7 7 7 7 7 7 7 7 7 7
 8 8 8 8 8 8 8 8 8 8
 9 9 9 9 9 9 9 9 9 9

NAME _____
 SUBJECT _____
 PERIOD _____ DATE _____

Feedback Form

Study Guide - Industrial Electrician

Please answer the following:

- (1) This Study Guide is a useful tool for exam preparation.
☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree
- (2) The topics contained in the guide are arranged in a logical order.
☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree
- (3) The design and format of the guide caught my attention.
☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree
- (4) The instructions throughout the guide are clear and to the point.
☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree
- (5) The resources listed in this guide are suitable and valuable.
☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree
- (6) The guide should contain more information.
☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree

Suggested information/resources to include:

Additional Comments:

Please complete this form and return via fax or mail to the following:

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Apprenticeship and Trades Certification Division
Standards and Curriculum Unit
45 Tilley's Road, Clarenville, NL A5A 1Z4
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Department of Education and Early Childhood Development
Apprenticeship and Trades Certification Division

