



# Industrial Maintenance Interview Outline



# Industrial Maintenance Technical Interview Outline

The Technical Interview consists of the following components:

- Aptitude Battery (*no calculators allowed*)
- Multi Skill Test (*non programmable calculators allowed*)
- Recommendation for a Personnel Interview (*application required*)

The 1<sup>st</sup> step in the process is the Aptitude battery (see outline). The aptitude testing session is conducted in a mass screening atmosphere, normally in a lecture, class or conference room. A presentation precedes the testing to inform applicants of our client's company, benefits, career opportunities, and to answer your questions. A one and one-half (1 ½)-hour block of time is required to conduct a session and feedback is given to each individual. *Successful completion of this step is required in order to proceed to the next step.*

The 2<sup>nd</sup> step will consist of a Multi Skill assessment on mechanical, electrical, and Industrial Math. This assessment has a two (2) hour maximum time limit. The results will be reviewed with the candidate upon completion. *Successful completion of this step is required in order to proceed to the next step.*

Upon successful completion of Step #1 and Step #2, the candidate will be referred for a Personnel Interview. Usually, this interview will be scheduled with the company within 5-10 business days. Occasionally, it could be completed on the same day as the Technical Interview.

## Other Notes:

- Confirm a testing session (*see invitation letter/email*)
- Bring a calculator
- Go to our resources page <http://careers.michelin-us.com/reltech.html> to download the Michelin mechanical, electrical, and math reference material



# Outline of the Aptitude Test Battery

\*\*\* CALCULATORS NOT ALLOWED \*\*\*

## Test #1: Applied Math Skills (20 minutes long)

- Ability to apply math skills to practical applications of everyday life
- Ability to add, subtract, multiply and divide
- Ability to function with whole numbers, decimals and fractions

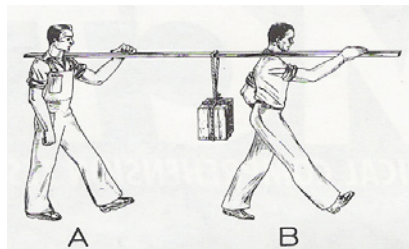
### Examples:

- (A) What is the total weight of four kegs of nails if each keg weighs 100 pounds?
- (B) There are 8 gallons of water in a tank which can hold 16.5 gallons. How many gallons can be added to this tank?
- (C) How many feet are there in 100 inches?

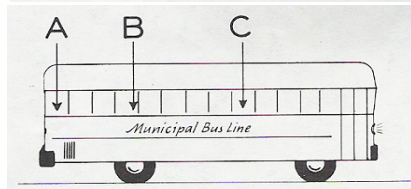
## Test #2: Mechanical Comprehension (30 minutes long)

- Ability to analyze pictures and determine elements and principles of mechanical concepts.

Look at Sample X and Y on this page. It shows two men carrying a weighted object on a plank, and it asks, "Which man carries more weight?" Because the object is closer to man B than to man A, man B is shouldering more weight.



X  
Which man carries more weight?  
(If equal, mark C.)

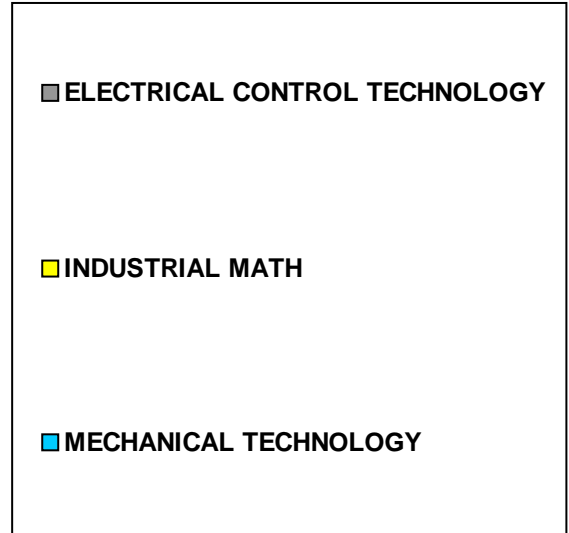
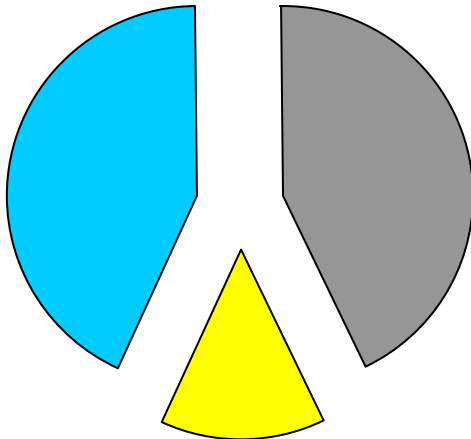


Y  
Which letter shows the seat where  
a passenger will get the smoothest ride?

# Michelin North America, Greenville SC

## Entry Level "Reliability Technician" Assessment

### Assessment Major Topic Percentages



**Number of Questions: 145**  
**Number of Task Statements Assessed: 46**

<u>Major Topic</u>	<u># of Questions</u>	<u>Percentage</u>
ELECTRICAL CONTROL TECHNOLOGY	62	42.8%
INDUSTRIAL MATH	20	13.8%
MECHANICAL TECHNOLOGY	63	43.4%

# *Knowledge and Skill Assessment Task Statements*

## *ELECTRICAL CONTROL TECHNOLOGY*

### *AC MOTORS*

*Able to troubleshoot motors (opens, grounds, and shorts)*

*Knowledge of AC motor construction*

*Knowledge of AC motor operation (squirrel cage, wound rotor, etc...)*

*Knowledge of nameplate data*

*Knowledge of wiring configurations*

### *AC THEORY*

*Able to calculate AC voltages and currents (effective, average, and peak)*

*Knowledge of AC voltage and current (effective, average, and peak)*

### *ACTUATORS AND SENSORS*

*Knowledge of common detectors*

*Knowledge of different operator heads and contact configurations*

*Knowledge of operation of proximity sensors*

### *BREAKERS AND FUSES*

*Knowledge of fuse and breaker types and ratings*

### *DC THEORY*

*Able to apply Ohm's law to solve problems*

*Knowledge of capacitance*

### *POWER AND CONTROL DEVICES*

*Able to determine faulty power and control devices*

*Knowledge of contactor and control relay operation*

*Knowledge of electrical and mechanical interlocks*

*Knowledge of the operation of "seal in" circuits*

*Knowledge of timer operations*

### *TRANSFORMERS*

*Knowledge of nameplate data and ratings*

*Knowledge of transformer theory*

### *TROUBLESHOOT POWER AND CONTROL CIRC*

*Knowledge of electrical schematic diagrams*

## *INDUSTRIAL MATH*

### *FUNDAMENTALS*

*Knowledge of area, volume, mass and weight*

*Knowledge of concepts of algebra*

*Knowledge of exponents*

*Knowledge of ratios and proportions*

### *METRIC SYSTEM*

*Knowledge of US and metric conversions*

### *TRIGONOMETRY*

*Knowledge of concepts of trigonometry*

*Knowledge of right angle trigonometry and vectors*

## *MECHANICAL TECHNOLOGY*

### *APPLIED FORCES*

*Knowledge of common units of torque*

*Knowledge of force, distance and fulcrum*

*Knowledge of torque and speed relations*

### *BEARINGS*

*Able to install and remove various types of bearings*

*Knowledge of bearing installation techniques*

*Knowledge of plain and anti-friction bearings*

### *DRIVE SYSTEMS*

*Able to determine direction of rotation in a drive system*

*Able to perform alignments using a straight edge and feeler gauge*

*Able to perform parallel/angular alignments*

*Knowledge of gear backlash*

### *FASTENERS*

*Able to correctly install fasteners*

*Knowledge of proper torquing procedures*

*Knowledge of standard and metric fasteners*

### *LUBRICATION*

*Knowledge of the properties of lubricants*

### *PRINT READING*

*Able to interpret and differentiate between all types of sectional views*

*Knowledge of sectional views*

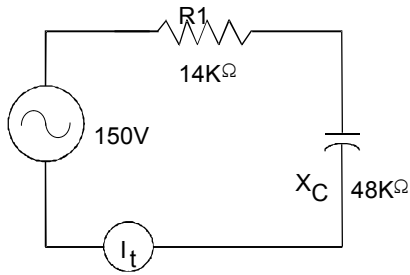
### *SHOP PROJECTS*

*Able to measure accurately to 0.001 inch or 0.02 millimeters*

*Able to use calipers, micrometers, height gauges, feeler gauges, dial indicators, and squares*

## Electrical Written Test Examples

In the figure below, what is the total current of the circuit?

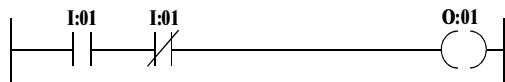


- A. 1.2 mA
- B. 2.4 mA
- C. 3.0 mA
- D. 10.7 mA

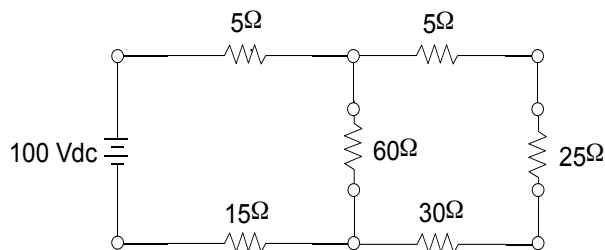
To prevent a voltmeter from loading the circuit being measured, the

- A. meter impedance should be low
- B. ohms per volt should be high
- C. sensitivity should be low
- D. circuit impedance should be high

Identify (if any) the logic traps that appear in the PLC ladder logic below.



- A. always on
- B. no trap, rung okay
- C. no way to turn rung off once true
- D. always off



The total resistance of the above circuit is \_\_\_\_\_ ohms.

- A. 50
- B. 100
- C. 150
- D. 200

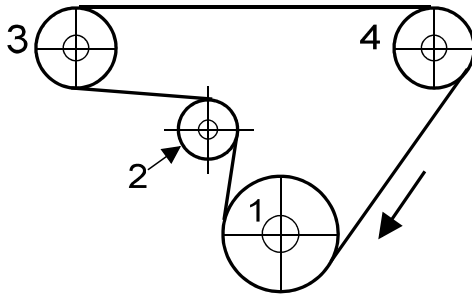


## Mechanical Written Test Examples

Which tool would you use to put threads inside a hole?

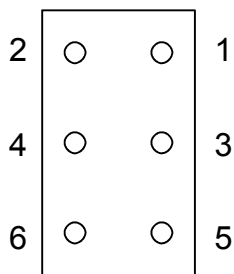
- A. file card
- B. snips
- C. pin punch
- D. tap

Which of the following pulleys turn the same direction as #1?



- A. 2 & 4
- B. 2 & 3
- C. 3 & 4
- D. 1 & 2

A correct torquing pattern for the figure below would be



- A. 123456
- B. 164235
- C. 341625
- D. 634125