Placement Exercise

Section 2: Comprehension
Welcome to the Con Edison Test Preparation Guide. The purpose of this Guide is to help you prepare for Con Edison aptitude placement exercises.

The aptitude placement exercises in Con Edison generally consist of four to six sections, each of which measures important underlying abilities necessary to complete Con Edison training programs and to perform the work we do. Section 2 focuses on the ability of comprehension.

Questions included in this Guide are not the actual questions contained in the Con Edison aptitude placement exercises. However these questions will enable you to apply and practice questions similar in format, content, and ability to those that do appear in the aptitude placement exercises. Your performance on the questions in this guide will provide you with information about your strengths as well as those abilities that you wish to practice further.

Please view the questions in this guide as one source of practice and further study. Your local library or bookstore is likely to contain other aptitude test practice resources. We encourage you to take advantage of these other test preparation resources as well.

Section 2: Comprehension

The questions in Section 2 of the Test Preparation Guide are designed to measure the ability of comprehension. This ability is defined\(^1\) as follows:

**Comprehension:** Understand and apply spoken and written numerical, verbal, graphic and symbolic information. Comprehension includes insightfulness, understanding and verbal meaning. Comprehension is necessary to learn new knowledge and skills.

This ability is essential to perform the position you have applied for. Section 2 questions are designed to measure your capacity to perform tasks requiring this ability. Some example tasks that require this ability are:

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\(^1\) These definitions are based on information appearing in the Threshold Traits Analysis Technical Manual (Revised in Progress), © Lopez and Associates, Inc. 2016 All Rights Reserved.
• Read and apply information contained in technical specifications, operating procedures, and/or system descriptions.

• Understand and apply mechanical principles to job situations.

• Interpret various types of prints, schematics, and diagrams (e.g., one-line diagrams, functional, block, and wiring diagrams, symbols, etc.).

• Describe operating, maintenance, or technical problems to supervisors, engineers, or vendor specialists.

• Complete classroom training courses, read classroom workbooks, and pass classroom examinations.

• Understand the function and interrelationship of equipment that comprises a larger system.

• Read and analyze maps, diagrams, and plates to locate equipment, install grounds, identify equipment characteristics, ensure adequate worker protection, etc.

• Understand verbal instructions of lead workers, supervisors and others.

• Understand the cause and effect relationships among equipment (e.g., the effect of changing the status of once piece of equipment on the performance of other equipment).

The ability of comprehension is first necessary for all new employees to learn how to perform these tasks on the job.

**IMPORTANT**

The information in this Test Preparation Guide is for exercise purposes only and is not intended to replicate exact Con Edison work practices, diagrams, or procedures.
READING COMPREHENSION

Items 1 – 7 require you to read and interpret passages. The example shows you how to complete the items in this section.

Example:

**SAFEGUARDS FOR WORKING ON ELECTRICAL EQUIPMENT**

*Cable and electrical equipment are divided into three general voltage classifications:*

- **Low Voltage:** 0-600 volts.
- **Intermediate Voltage:** 600 to 5,000 volts.
- **High Voltage:** over 5,000 volts.

An electrical cable rated at 1,850 volts is classified as:

A. low voltage.
B. intermediate voltage.
C. high voltage.
D. None of the above.

To answer the Example item, you must refer to the “Safeguards for Working on Electrical Equipment” passage above. From the information provided, the answer is B “intermediate voltage.” Therefore, you would select choice B as your answer.

Now complete items 1 – 7 as shown in the example.
SAFEGUARDS FOR WORKING ON ELECTRICAL EQUIPMENT

When work is required on high voltage underground cable or equipment or on such intermediate and low voltage cable as may be designated by responsible authority to be de-energized and removed from service, for the protection of life and property, the operator having jurisdiction, as defined in the Rule Book, shall be responsible for its isolation and for the protection as required by the operating rules and regulations.

There are in general, two approved methods of protection for safeguarding work on system electrical equipment. These are:

- Protection applied at the working point or at other points to prevent accidental energizing of current carrying parts which have been de-energized for dead work. The use of this method of protection is applicable to work on equipment in any voltage classification. The means employed to prevent accidental energizing of current carrying parts varies for equipment in different voltage classifications and in different working locations.

  To ensure that electrical equipment is dead and before proceeding with any operation, all conductors must be tested with an approved "voltage detector." Approved rubber gloves must be used while making this test. The voltage detector must be tested before and after use.

- Protection applied by the worker at the working point in the form of insulating protective devices approved for "live work." Such devices include high voltage or low voltage rubber gloves as required, rubber mats, insulating stools and platforms or insulated tools for insulating the workman from contact with current carrying parts or from contact with grounded parts.

  The term insulating protective devices also includes rubber mats, blankets, bandages, line hose, hoods, pigs and other approved insulating devices intended primarily for protecting the workman from contact with current carrying parts in close proximity to the parts being worked upon.
Refer to the “Safeguards for Working on Electrical Equipment” passage on the facing page to answer items 1 – 3 below.

1. The person who is responsible for the proper isolation and protection required to work on a piece of high voltage equipment is:
   
   A. the supervisor.
   B. the operator having jurisdiction.
   C. any employee with high voltage equipment training.
   D. It is the responsibility of all company employees.

2. The term “live work” (underlined in the passage) refers to work performed:

   A. by mechanics.
   B. on unprotected equipment.
   C. on energized equipment.
   D. on equipment rated as high voltage.

3. The number of approved methods of protection for safeguarding work on electrical equipment is:

   A. 1
   B. 2
   C. 3
   D. 4
Con Edison Distribution System

The Con Edison distribution system covers 604 square miles and contains a 2000 census population of 8,777,089 including the Bronx/Westchester Region, Brooklyn/Queens Region, Manhattan Region, and Staten Island Region. The electric distribution system consists of 55 area substations supplying 73 secondary networks and non-network 27kV, 13kV and 4kV load. As of January 1, 2001 we served 3,096,627 electric customers: 2,271,414 network and 825,213 non-network. Approximately 86 percent of 23,884,933 kVA distribution transformer capacity is underground and 14 percent is overhead. (These data do not include the service area of Orange & Rockland Utilities which is now part of the Con Edison system.)

Underground System

The underground distribution system 27, 13 and 4kV includes: 255,027 manholes and boxes; 22,444 conduit miles of duct; 33,077 underground transformers totaling 20,598,141.5 kVA (8,738 URD and pad-mount transformers totaling 1,205,522 kVA) and 88,718 miles of underground cable including primary, secondary and services.

Overhead System

The overhead distribution system 33, 27, 13 and 4kV includes: 134–autoloops, 7–4kV multibank and 219–4kV unit substations; 200,290 poles, 45,814 overhead transformers totaling 3,286,791.1 kVA and 33,583 miles of overhead wires including primary, secondary and services.

Distribution Feeders

There are 1,958 distribution feeders including 21–33kV, 310–27kV, 876–13kV and 751–4kV which supply non-network and network load.
Refer to the “Con Edison Distribution System” passage on the facing page to answer items 4 – 7 below.

4. The Con Edison distribution system is located in all of the following geographic areas except:
   A. Bronx/Westchester.
   B. Brooklyn/Queens.
   C. Nassau/Suffolk.
   D. Manhattan.

5. A 4kV unit substation is a component of the Con Edison:
   A. overhead system.
   B. underground system.
   C. pad mounted transformer system.
   D. distribution feeder system.

6. The underground system includes all of the following voltages except:
   A. 4 kV
   B. 13 kV
   C. 27 kV
   D. 33 kV

7. The largest number of distribution feeders are of:
   A. 4 kV voltage.
   B. 13 kV voltage.
   C. 27 kV voltage.
   D. 33 kV voltage.
READING GRAPHS

Items 8 – 9 require you to read and interpret graphs. The example shows you how to complete the items in this section.

Example:

When the quantity of Material A is 40 tons, the quantity of Material B is:

A. 30 lbs.
B. 40 lbs.
C. 50 lbs.
D. 60 lbs.

To answer the Example item, you must refer to the “Quantity of Materials” graph above. First locate the 40 tons on the vertical axis (Material A) and then move across the graph to the diagonal (bold) line. Follow a straight line from this point down to the horizontal axis. The horizontal axis indicates 60 lbs. (Material B). 60 lbs. corresponds to choice D, so you would select choice D as your answer.

Now complete items 8 – 9 as shown in the example.
Refer to the graph below to answer item 8.

8. As the quantity of Material B increases, the quantity of Material A:

   A. increases.
   B. decreases.
   C. remains unchanged.
   D. increases and then decreases.
Refer to the graph below to answer item 9.

9. If Variable X has a content of 1.25, the temperature of the air is closest to a value of:

A. 150°F  
B. 120°F  
C. 140°F  
D. 130°F
READING MAPS

Items 10 – 11 require you to read and interpret maps. The example shows you how to complete the items in this section.

Example:

Referring to the diagram above, the point located on Main Street and west of Oak Road is:

A. Point A  
B. Point B  
C. Point C  
D. Point D

To answer the Example item, you must refer to the map above. Through examination of the map, you can see that Points B, C and D are all located on Main Street, however only one of them is west of Oak Road. Point B is west of Oak Road. Therefore, you would select choice B as your answer.

Now complete items 10 – 11 as shown in the example.
Refer to the map below to answer items 10 – 11.

10. Referring to the diagram above, the point located at the southwest corner of Box Avenue and Circle Drive is:

   A. Point G  
   B. Point E  
   C. Point F  
   D. Point D

11. Referring to the diagram above, the point located directly in the middle of Box Avenue and east of Circle Drive is:

   A. Point G  
   B. Point B  
   C. Point E  
   D. Point D
FOLLOWING PROCEDURES

Items 12 – 13 require you to interpret procedures and determine if actions are consistent with the procedure. The example shows you how to complete the items in this section.

Example:

Procedure: A contractor shall obtain all appropriate permits prior to commencing work.

Action: A contractor began work at a site on November 8. The appropriate permits were obtained on November 9.

The action above is:

A. Consistent with the procedure.
B. Inconsistent with the procedure.
C. Inconclusive. It cannot be determined if the action is consistent or inconsistent with the proposal.

According to the action, the permits were obtained one day after the work began. Therefore, the action is inconsistent with the procedure. Since choice B is “inconsistent with the procedure,” you would select choice B as your answer.

Now complete items 12 – 13 as shown in the example.
12. **Procedure:** Type A materials shall be used within the limits of six inches above and to either side of all pipes. Type B materials shall be used beyond the six inch limit.

**Action:** While performing repairs within 5 inches of the nearest pipe, the contractor used Type A materials. Later in the day, the contractor used these same materials when performing repairs 18 inches from the nearest pipe.

The action above is:

A. Consistent with the procedure.
B. Inconsistent with the procedure.
C. Inconclusive. It cannot be determined if the action is consistent or inconsistent with the proposal.

13. **Procedure:** Pipes that meet the requirements set forth in Specification ABC shall be used for all piping work performed by the Piping Department. Service connections and/or extensions to the property line shall be installed in accordance with Specification XYZ and only after approval is obtained.

**Action:** While designing the scope of work required for an extension to a property line, the engineer referred to Specification XYZ and obtained approval for the work.

The action above is:

A. Consistent with the procedure.
B. Inconsistent with the procedure.
C. Inconclusive. It cannot be determined if the action is consistent or inconsistent with the proposal.
READING TABLES

Items 14 – 15 require you to interpret read and interpret a table. The example shows you how to complete the items in this section.

Example:

<table>
<thead>
<tr>
<th>Pipe Diameter (in inches)</th>
<th>Weight/Foot (in lbs. per foot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.2</td>
</tr>
<tr>
<td>2</td>
<td>3.4</td>
</tr>
<tr>
<td>3</td>
<td>4.6</td>
</tr>
<tr>
<td>4</td>
<td>5.8</td>
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<tr>
<td>5</td>
<td>7.0</td>
</tr>
</tbody>
</table>

The weight per foot of 3” diameter Steel Pipe is:

A. 3.4 lbs. per foot.
B. 4.6 lbs. per foot.
C. 5.8 lbs. per foot.
D. 7.0 lbs. per foot.

To answer the example, you would refer to the table above and read across the row corresponding to the Pipe Diameter of 3”. According to the table, the correct answer is B - “4.6 lbs. per foot.” Therefore, you would select choice B as your answer.

Now complete items 14 – 15 as shown in the example.
Refer to the table below to answer items 14 – 15.

<table>
<thead>
<tr>
<th>Rope Diameter (inches)</th>
<th>Rope X</th>
<th>Rope Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3/8</td>
<td>6</td>
<td>6</td>
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<tr>
<td>1/2</td>
<td>10</td>
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<td>32</td>
<td>34</td>
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<td>1</td>
<td>41</td>
<td>45</td>
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<td>1-1/8</td>
<td>52</td>
<td>56</td>
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<td>1-1/4</td>
<td>64</td>
<td>68</td>
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<td>1-3/8</td>
<td>77</td>
<td>83</td>
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<tr>
<td>1-1/2</td>
<td>91</td>
<td>99</td>
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14. A review of the breaking strengths of Rope X and Rope Y leads to the following conclusion:

A. Rope X is stronger than Rope Y across all diameters.
B. Rope X and Rope Y are equal in strength across all diameters.
C. As diameter increases, Rope Y tends to be stronger than Rope X.
D. Rope Y is consistently 50% stronger than Rope X across all diameters.

15. If rope is required to lift a load weighing 40 tons, and you require a safety margin of 20 tons, it is true that you could use either Rope X or Rope Y with a diameter of at least:

A. 1 inch
B. 1-1/8 inch
C. 1-1/4 inch
D. 7/8 inch
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