

Sample Test Packet

Mechanics Program

As part of the Selection Process you will be required to test and receive a passing score on the following:

- Mechanical Concepts
- Precision Measurement
- Electrical Aptitude
- Applied Technology
- Work Attitude

This packet, which includes sample test questions from some of the above topics, has been provided for your review.

Additional sample test questions for Applied Technology are available at:
www.act.org/workkeys/assess/sample.html

General Instructions

You are about to take a test of mechanical understanding. The test is made up of three short tests: Mechanical Interrelationships, Mechanical Tools and Devices, and Spatial Relations. Each test has its special instructions, which you should read carefully. There is no time limit on this test, but it is typical to spend ten to fifteen minutes on each section.

This is a carbon-insert test booklet, so no separate answer sheet is provided. Mark all your answers in the test booklet. For each item, you are given from two to five alternatives, labeled A, B, C, D, and E. You are to indicate your answer by marking an X in the appropriate answer box for each item: . If you wish to change your answer, draw a circle around your first answer () and then mark your new choice. Do NOT erase any answer you have marked.

Your score on this test is based on correct answers only. You are not penalized for wrong answers; so if you are not sure of an answer, make the best choice you can. Try not to leave any items blank.

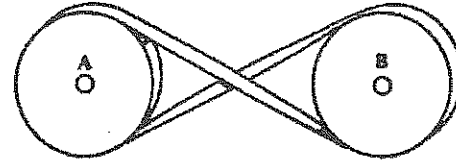
Are there any questions?

Mechanical Interrelationships

Directions

This is a test designed to see how well you can understand and interrelate mechanical concepts. This section consists of pictures that depict mechanical movements and model interrelationships. You must answer the items on the basis of your understanding of the concepts being shown.

S1. Look at the sample item below:

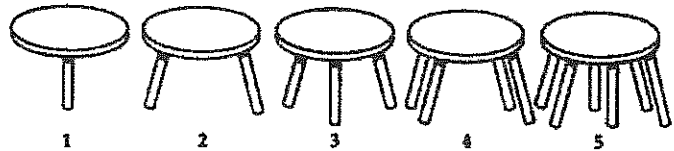


- S1. The belt connecting the two identical pulleys in this illustration has been crossed. This will result in
- A. an increase in the speed of pulley A A
 - B. an increase in the speed of pulley B B
 - C. a turn of one pulley in the opposite direction C
 - D. no change in pulley speed or direction D

The correct answer is alternative C. An X has been placed in the box marked C.

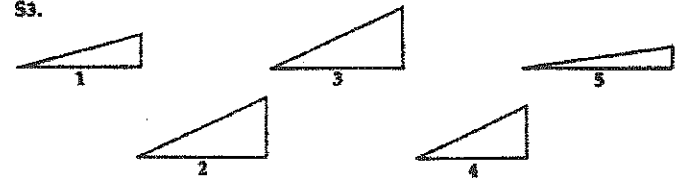
Now try these sample items. In each problem, place an X in the box corresponding to the correct answer.

S2.



- S2. Which one of these stools is most likely to be steady on an uneven surface?
- A. A one-legged stool A
 - B. A two-legged stool B
 - C. A three-legged stool C
 - D. A four-legged stool D
 - E. A six-legged stool E

S3.



- S3. Several workers roll a 500-pound barrel up each of the five ramps shown. Which ramp requires the least amount of work?
- A. Ramp 1 A
 - B. Ramp 2 B
 - C. Ramp 3 C
 - D. Ramp 4 D
 - E. Ramp 5 E

You should have marked the box labeled C for item S2 and the box labeled E for item S3. Do you understand how to mark the sample items? If not, do the samples again.

Are there any questions?

When the examiner gives the signal, you may begin. When you have finished this section, wait for further instructions. DO NOT GO ON TO THE NEXT SECTION.

RAMSAY CORPORATION JOB SKILLS

PRECISION MEASUREMENT – FORM ARL

INSTRUCTIONS

This is a test of your ability to measure, inspect, and follow directions. On the following pages is a series of questions. You are to read each question and select the best answer below the question. Then blacken the letter of the correct answer on the blue general purpose answer sheet. Do not write in the test booklet. Now look at the Practice Exercises below. Note the way in which the answers are marked on the sample answer sheet.

Practice Exercises

H. The gauge below shows a reading of

- A. 0.
- B. 50.
- C. 100.
- D. 150.
- E. 200.



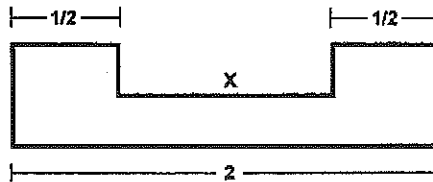
I. Measure the following.



- A. $\frac{1}{2}$ "
- B. $\frac{3}{4}$ "
- C. 1"
- D. $1\frac{1}{2}$ "

J. What is the length of X in the diagram below?

- A. $\frac{1}{2}$
- B. 1
- C. $1\frac{1}{4}$
- D. $1\frac{1}{2}$
- E. 2



SAMPLE ANSWER SHEET

	A	B	C	D	E
H.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
I.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
J.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ

Now do the 60 exercises on the following pages. Do not write in the test booklet. You may do your work on the scratch paper provided. Do not begin until you are told to do so.

Published by
ROLAND T. RAMSAY, Ph.D.
RAMSAY CORPORATION

1050 BOYCE ROAD
PITTSBURGH, PA 15241-3907
COPYRIGHT©1998, 2007
Printed in U.S.A.

RAMSAY CORPORATION JOB SKILLS

ELECTRICAL APTITUDE TEST FORM EAR - C

INSTRUCTIONS

This is a test of electrical aptitude. On the following pages are problems like the ones below. Do each problem and then mark your answer on the answer sheet. Do not write in the test booklet. Now look at the practice exercises below. Note how the answers have been marked. Do not turn the page until you are told to do so.

Practice Exercise W

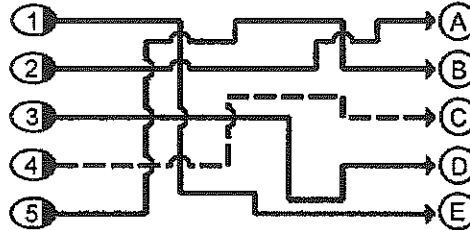
Solve for x.

$$3 + x = 5$$

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

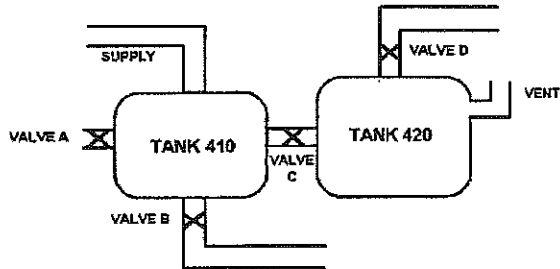
Practice Exercise X

Trace the line from left to right to determine the letter at the endpoint. What is the endpoint of line 4?



Practice Exercise Y

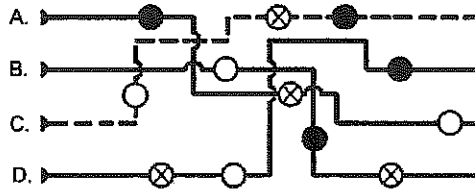
To move liquid from Tank 410 to Tank 420 you should



- A. open valve A.
- B. open valve B.
- C. open valve C.
- D. open valve D.

Practice Exercise Z

In order for the connection to be complete, the current must pass through three contacts in exactly the following order O ⊗ ●. Which connection is complete?



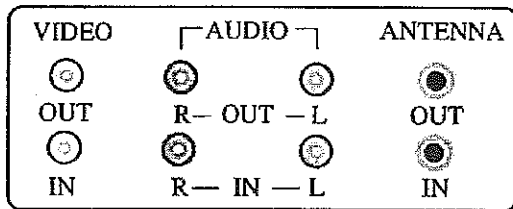
	A	B	C	D	E
W	①	●	③	④	⑤
	A	B	C	D	E
X	①	②	●	④	⑤
	A	B	C	D	E
Y	①	②	●	④	⑤
	A	B	C	D	E
Z	①	②	●	④	⑤

Now do the 36 exercises on the following pages. Do not write in the test booklet. Work as fast as you can without making mistakes. You will have 18 minutes to finish the test. Do not begin until you are told to do so.

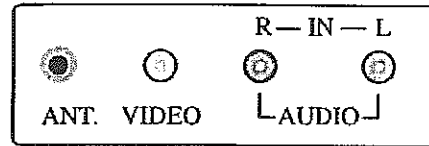
Published by
ROLAND T. RAMSAY, Ph.D.
RAMSAY CORPORATION
1050 BOYCE ROAD
PITTSBURGH, PA 15241-3907
COPYRIGHT©2003
Printed in U.S.A.

Example A

An employee must connect a videocassette recorder (VCR) to a television in order to play a recording of the company's new television advertisement. To set up the equipment properly, the audio (sound) and video (image) cables must be plugged into the correct input/output jacks, which are similar to the ones shown in the diagram below. Both the VCR and the television accept a separate audio signal for each of two speakers.



VCR Inputs/Outputs



Television Inputs

After connecting the audio, video, and power cables, the employee plays a videotape to test the installation. The sound comes through the built-in television speakers, but the screen displays random snow. The employee must know what to check first to identify the problem.

Solution:

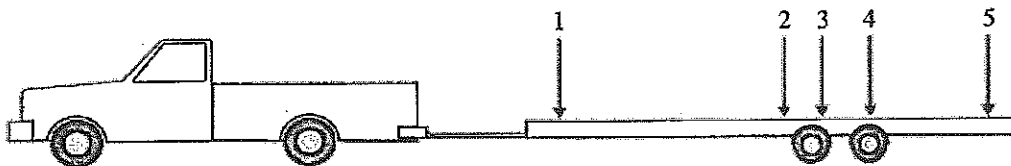
The employee must first understand the operation of the video signals traveling from the VCR's video output jack to the TV's video input jack and the operation of the audio signals traveling from the VCR's audio output jack to the TV's audio input jack (that is, the function of two variables). He or she must determine from the sign of trouble (random snow) which component is faulty: the audio connection or the video connection.

This example is at Applied Technology Level 4 because of the following:

Level 4 Characteristics	Example A
The problem involves one moderately complex system with five components:	VCR, television, audio in and out, video in and out, antenna
The problem involves the interaction of two variables:	Video signals travel from the VCR's video output jack to the TV's video input jack, and audio signals travel from the VCR's audio output jack to the TV's audio input jack.
Employees must apply less obvious basic principles (of electricity):	"Random snow" indicates the problem is video rather than audio.
Employees must identify the best solution after getting rid of other unsuitable options:	The sound is working, so the audio connection can be eliminated as a source of the problem.

Example B

An employee works for an industrial services company that has been hired to deliver a small but heavy gearbox. The container is too small to justify renting a large truck and too heavy for the company's pickup truck. The employee decides to rent a heavy-duty utility trailer and pull the trailer with the pickup truck. The employee must know where to place the gearbox so that the trailer will support the load for safe and easy towing.



Solution:

The employee must first understand that the wheels of each axle on both the trailer and the truck need to maintain adequate traction for safe and easy towing and that the load should be supported by the two axles of the trailer. He or she must then eliminate load positions that would tip the trailer (positions 1 and 5) or that are away from the middle point between the axles (positions 2 and 4). Using this process, the employee should recognize that position 3 provides the best support for the load.

This example is at Applied Technology Level 4 because of the following:

Level 4 Characteristics	Example B
The problem involves two simple systems working together to create a moderately complex system:	The truck and trailer are interacting with each other.
Employees must understand the operation of a moderately complex system:	The wheels of the truck and trailer need proper weight balance for traction, safety, and towing ease.
Employees must apply less obvious basic principles (of mechanics):	Positions 1 and 5 would tip the trailer (leverage); positions 2 and 4 would cause too much of the weight to rest on a single axle (forces).
Employees must identify the best solution after getting rid of other unsuitable options:	Position 3 would allow the weight to rest on both axles of the trailer.