

This page is a sample of the type of math problems that may be on the test you will be taking towards acceptance into the apprenticeship. Please note this is a practice sheet for you to use, do not return. Also note the math portion is only one section of the 4 part test. The entire test consists of:

1) Math      2) Spatial Aptitude      3) Mechanical Aptitude      4) General Knowledge

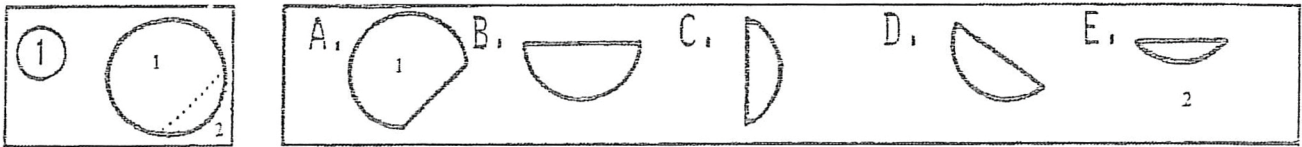
1. $\begin{array}{r} 44 \\ + 4 \\ \hline \end{array}$	2. $\begin{array}{r} 76 \\ - 65 \\ \hline \end{array}$	3. $\begin{array}{r} 897 \\ 7662 \\ 83 \\ + 2334 \\ \hline \end{array}$	4. $\begin{array}{r} 834 \\ - 725 \\ \hline \end{array}$	5. $4\frac{1}{2} + 2\frac{1}{2} =$
6. $\begin{array}{r} 5\frac{1}{5} \\ 3\frac{1}{4} \\ + 2\frac{1}{2} \\ \hline \end{array}$	7. $\begin{array}{r} 5\frac{1}{4} \\ 2\frac{3}{8} \\ + 6\frac{1}{2} \\ \hline \end{array}$	8. $4 - \underline{\hspace{1cm}} = 1\frac{1}{3}$	9. $\begin{array}{r} 13\frac{1}{5} \\ - 6\frac{3}{4} \\ \hline \end{array}$	10. $\begin{array}{r} 15 \\ \times 3 \\ \hline \end{array}$
11. $\begin{array}{r} 873 \\ \times 46 \\ \hline \end{array}$	12. $\begin{array}{r} 73 \\ \times 3.4 \\ \hline \end{array}$	13. $\begin{array}{r} 53.7 \\ \times 6.51 \\ \hline \end{array}$	14. $\frac{50}{5}$ Answer _____	15. $15 \overline{)65}$
16. $\frac{3}{4} \times \frac{5}{16}$ Answer _____	17. $\frac{3}{20} \div \frac{3}{8}$ Answer _____	18. $\frac{2}{7}$ of 49 = _____	19. 12% of 96 = = _____	20. Write as a common fraction in lowest terms: .085 = _____
21. $6^3 = \underline{\hspace{1cm}}$	22. If X = 6, B = 2, Solve $X + 3B = \underline{\hspace{1cm}}$	23. Solve: $\frac{10 - (8 + 7)}{-5}$ Answer _____	24. $\begin{array}{r} -X - Y - 20 \\ \hline X - Y + 19 \end{array}$	25. $3p - q = 10$ $2p - q = 7$ p = _____ q = _____

# MATCHING PARTS AND FIGURES

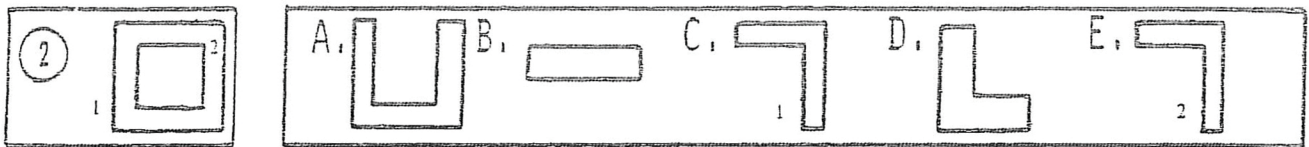
There are several types of questions that test your ability to match parts and figures. Although the directions may vary slightly, each question type requires you to visualize the shape or pattern that can result from fitting together a number of cut-up pieces.

Questions 1 and 2 below illustrate one type of a Matching Parts and Figures question. In these questions, you are given one numbered figure and a group of five lettered figures. You are to choose the two lettered figures that, when put together, make a figure of the same size and shape as the numbered figure.

Look at question 1. The numbered figure is a circle. Each lettered figure is a part of a circle; however, only alternatives A and E will fit together to make a complete circle of the same size as the given circle.



Now try question 2.

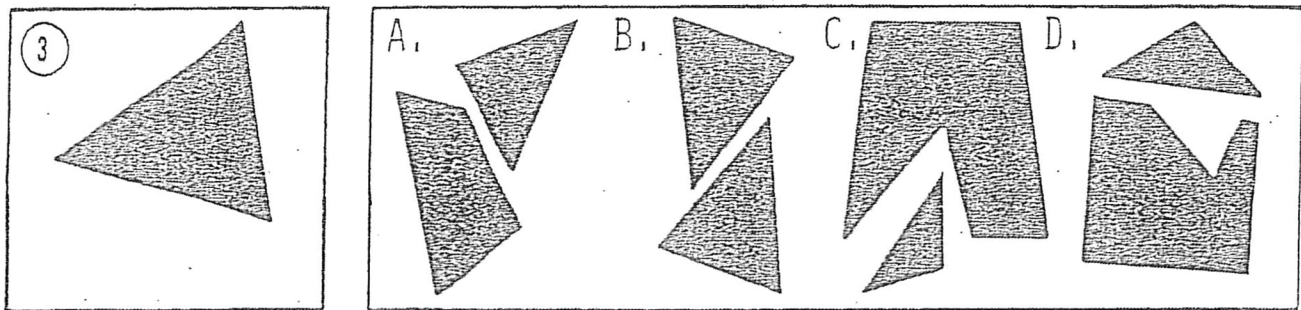


Only alternatives C and E will fit together to form the square within a square illustrated by the given figure.

Question 3 shows another variation on matching parts and figures. In this question, you are given a numbered pattern together with four lettered groups of cut-up pattern pieces. Here the task is to determine which group of pieces will fit together to form the numbered pattern. The cut-up pieces may be turned

around or turned over to make them fit the given pattern, but there can be no spaces between pieces and no overlapping edges.

The only two pieces that will fit together to form the pattern shown in question 3 are the pieces shown in alternative A.

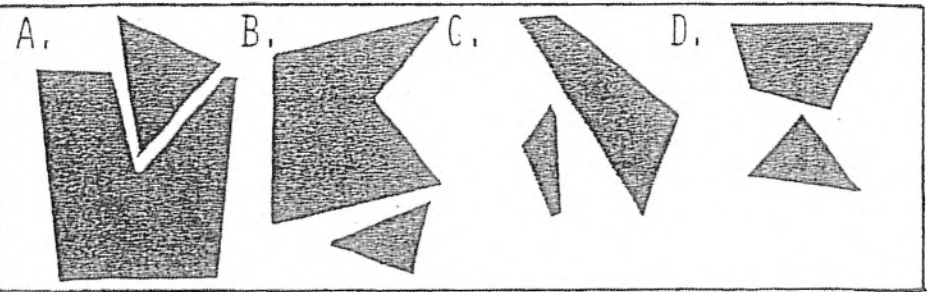
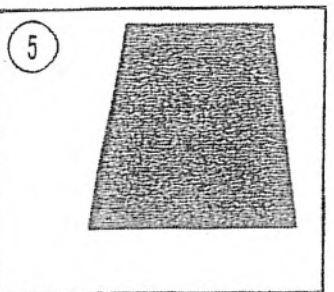
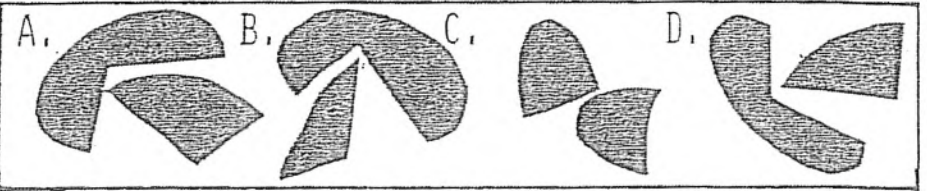
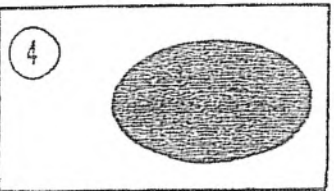
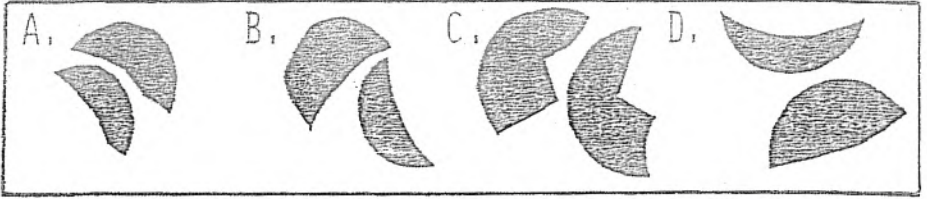
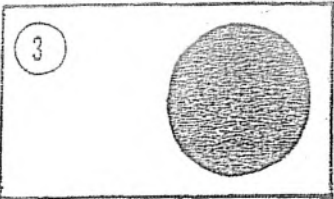
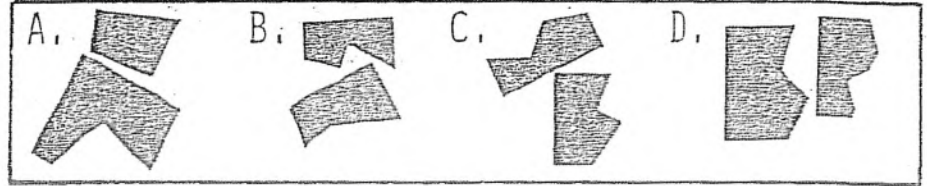
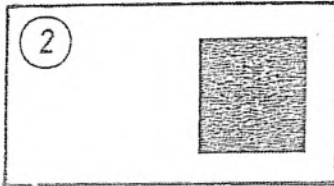
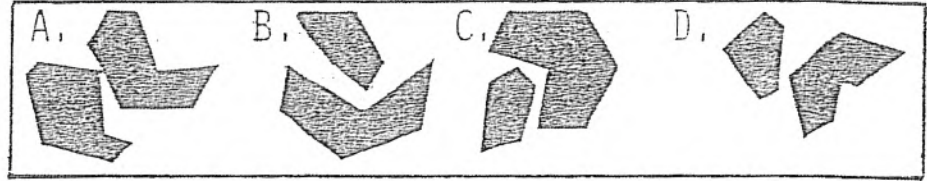
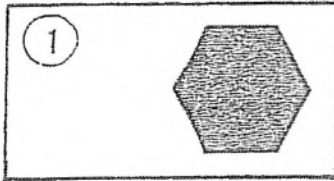


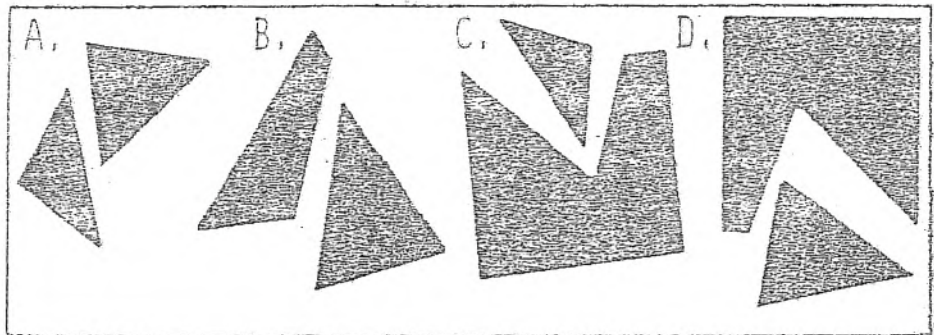
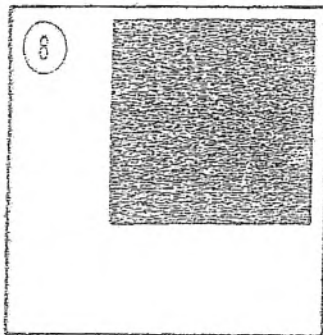
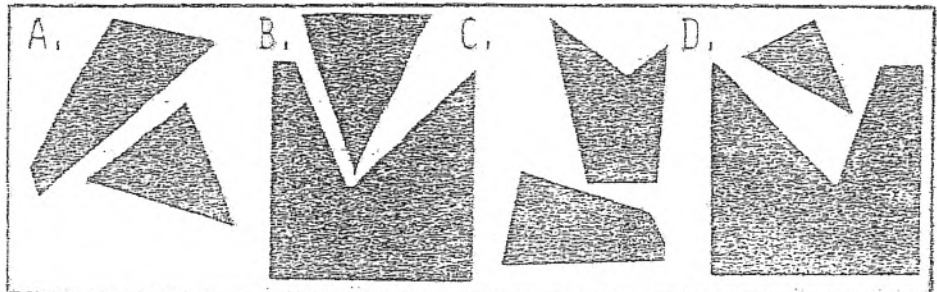
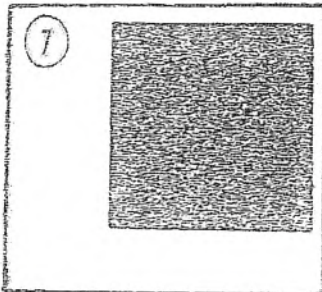
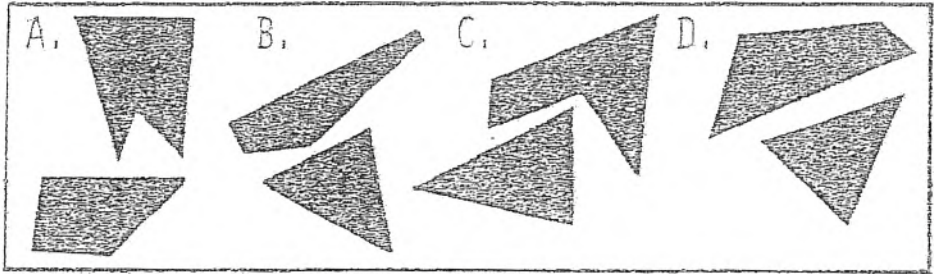
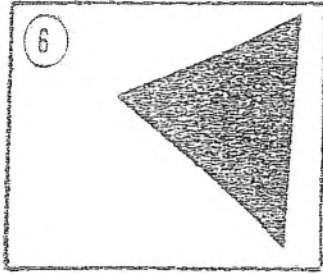
Questions 4 and 5 reverse the procedure used in the first three questions by giving you numbered pattern pieces and asking you to identify the complete pattern that can be made from the pieces shown.

As in the other question types, you may have to mentally turn over or turn around the pieces given to create the pattern.

# TEST 3: MATCHING PARTS AND FIGURES

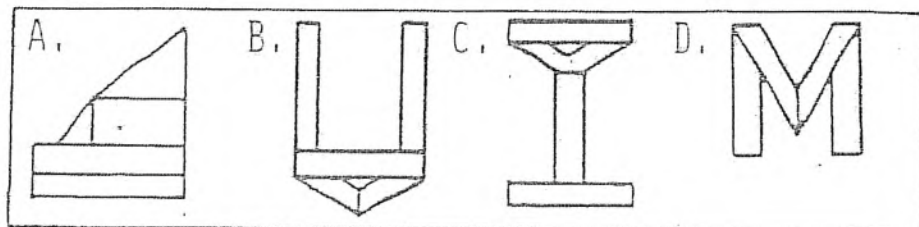
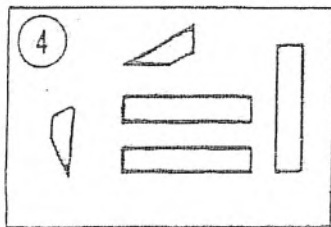
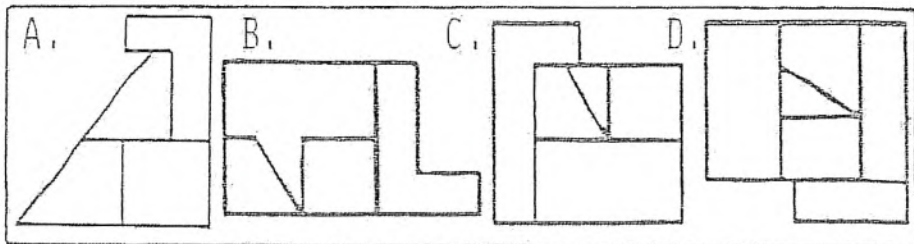
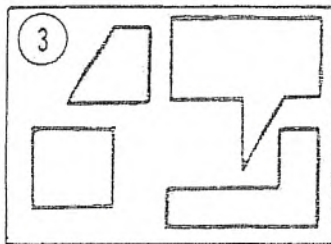
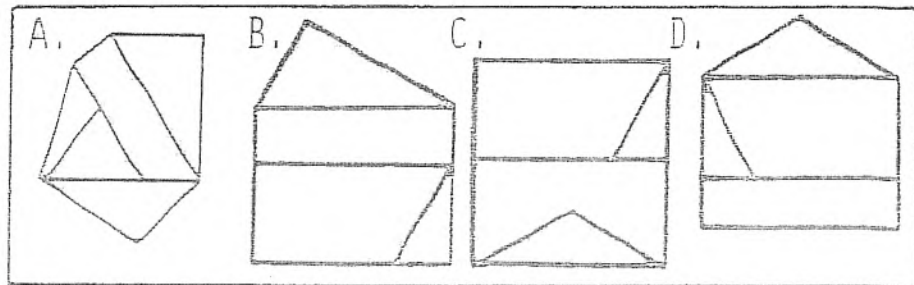
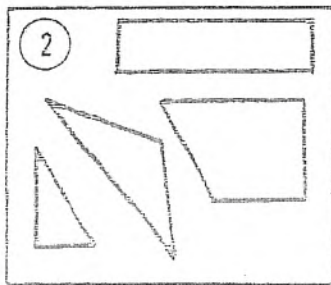
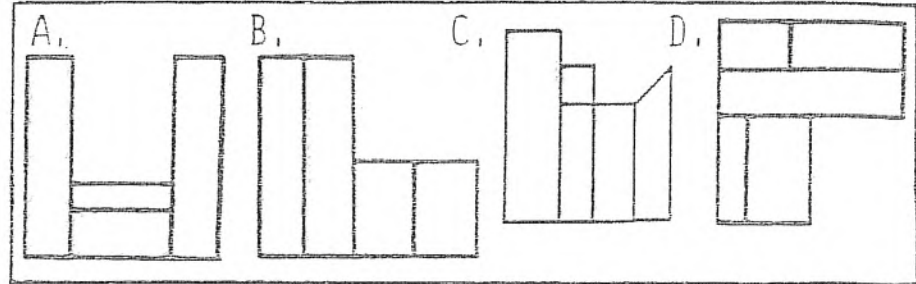
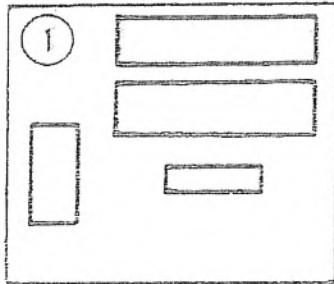
Directions: Each question in this test consists of a numbered picture showing a single solid pattern and a group of four lettered pictures showing cut-up pattern pieces. For each question, choose the lettered combination of cut-up pieces that, when put together, will make up the numbered pattern shown. The cut-up pieces may be turned around or turned over to make them fit





# TEST 4: MATCHING PARTS AND FIGURES

Directions: Each question in this test consists of a numbered picture that shows the parts of an object. To the right of the numbered picture are several objects lettered A, B, C, and D. You are to select the lettered object that is made up from the numbered parts.



# PERCEPTUAL ABILITY

*Perceptual Ability questions provide a measure of your powers of observation by requiring you to compare, contrast, and rank similar figures. These abilities are best tested by the following question types: Similarities and Differences Between Objects, Line Ranking, and Angle Comparisons. This section provides detailed explanations of each question type followed by practice tests to help you improve your perceptual skill.*

## SIMILARITIES AND DIFFERENCES BETWEEN OBJECTS

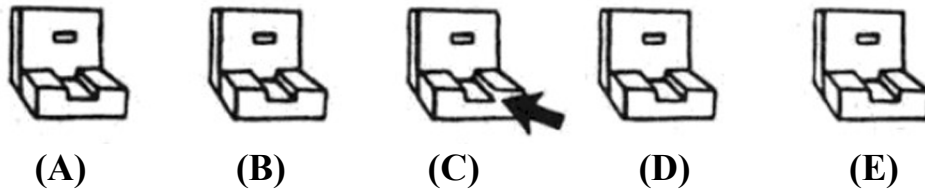
This is a test of your powers of observation. Each question consists of five drawings lettered (A), (B), (C), (D), and (E). Four of the drawings are exactly alike; one is slightly different. The task is to find the

one drawing that is different from the other four. Mark your answer sheet for the letter of the drawing that is different.

### A SIMILARITIES AND DIFFERENCES BETWEEN OBJECTS QUESTION EXPLAINED

At first glance, the five drawings below may seem identical. However, careful observation will reveal that one of the drawings is slightly different from the other four. Can you spot the drawing that is different?

The drawing lettered C is the one that is different. There is a line missing from the right corner segment of this drawing, which is present in each of the other four drawings in the group.



## LINE RANKING AND ANGLE COMPARISON TESTS

The Line Ranking and Angle Comparison Tests are designed to measure your two-dimensional perception and problem-solving ability. These are question styles that are probably unfamiliar to you and with which you have had no previous experience. While a

naturally “good eye” will stand you in good stead, you can prepare yourself for these questions by learning how to approach each problem and by investing sufficient time in practice.

# TEST 1: SIMILARITIES AND DIFFERENCES BETWEEN OBJECTS

**Directions:** Each question consists of five drawings lettered (A), (B), (C), (D), and (E). Four of the drawings are exactly alike; one is slightly different. Select the one drawing that is different, and mark your answer sheet for the letter of that drawing. Check your answers with the correct answers at the end of the section.

①



(A)

(B)

(C)

(D)

(E)

②



(A)

(B)

(C)

(D)

(E)

③



(A)

(B)

(C)

(D)

(E)

④



(A)

(B)

(C)

(D)

(E)

⑤



(A)

(B)

(C)

(D)

(E)

6



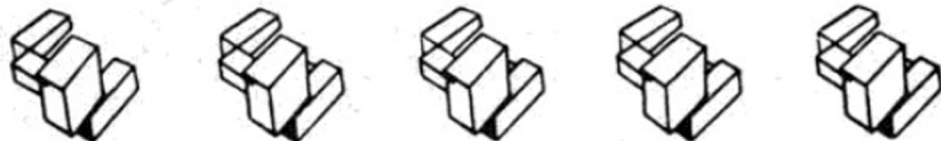
(A) (B) (C) (D) (E)

7



(A) (B) (C) (D) (E)

8



(A) (B) (C) (D) (E)

9



(A) (B) (C) (D) (E)

10



(A) (B) (C) (D) (E)

11



(A) (B) (C) (D) (E)



12



(A)



(B)



(C)



(D)



(E)

13



(A)



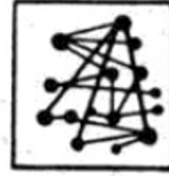
(B)



(C)



(D)



(E)

14



(A)



(B)



(C)



(D)



(E)

15



(A)



(B)



(C)



(D)



(E)

# TEST 1: MECHANICAL INSIGHT

Directions: For each question, read all the choices carefully. Select that answer that you consider correct or most nearly correct. Blacken the answer space corresponding to your best choice, just as you would on the actual examination

The Arrow Indicates a Clockwise Turn

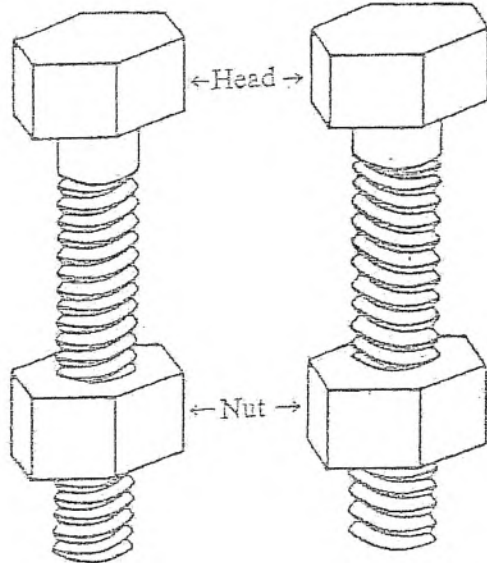


Figure 1

Figure 2

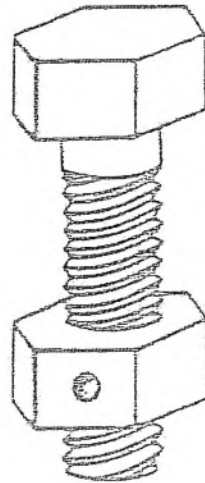


Figure 3

1. Examine Figure 1 and determine which of the following statements is true.

- (A) If the nut is held stationary and the head, turned clockwise, the bolt will move up.
- (B) If the head of the bolt is held stationary and the nut is turned clockwise, the nut will move down.
- (C) If the head of the bolt is held stationary and the nut is turned clockwise the nut will move up.
- (D) If the nut is held stationary and the bolt is turned counterclockwise, the bolt will move down.

2. Referring to Figure 2, which one of the following statements is true?

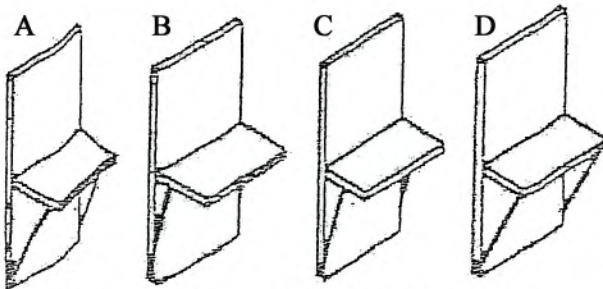
- (A) If the nut is held stationary and the head turned clockwise, the bolt will move down.
- (B) If the head of the bolt is held stationary and the nut is turned clockwise, the nut will move down.
- (C) If the head of the bolt is held stationary and the nut is turned clockwise, the nut will move up.
- (D) If the nut is held stationary and the head turned counterclockwise, the bolt will move up.

3. Figure 3 shows a bolt a nut, and five numbered pieces. If all of the pieces are long enough to go through the bolt, and if the circular hole extends through the bolt and through the other side of the nut, which piece must you use to fix the nut in a stationary position?

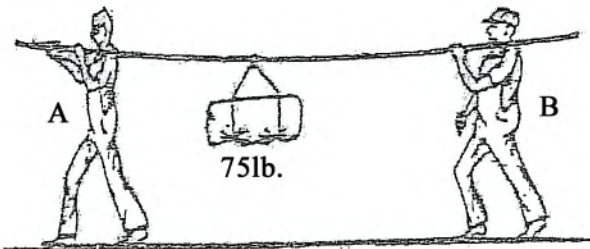
- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

# TEST V. MECHANICAL INSIGHT

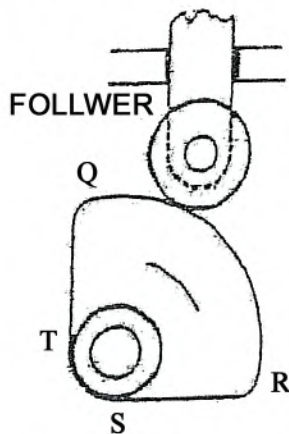
DIRECTION: For each question,, select the choice that best answers the question or completes the statement



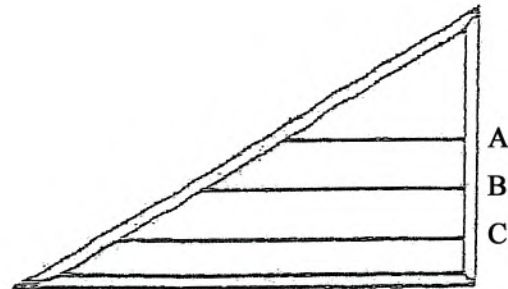
1. Which shelf can support the most weight?  
 (A) A  
 (B) B  
 (C) C  
 (D) D



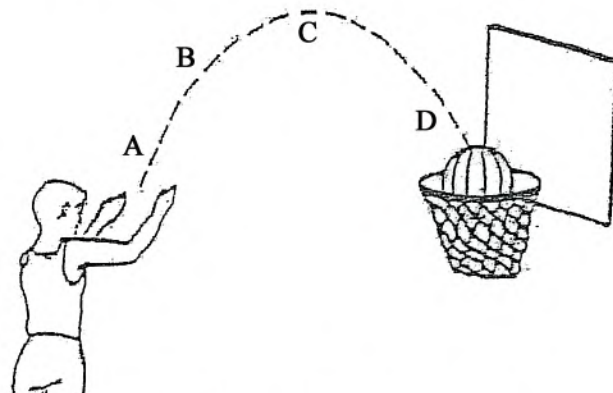
2. The weight is being carried entirely on the shoulder of the two men shown. Which men bears the most weight on his shoulder?  
 (A) A  
 (B) B  
 (C) Both men are carrying the same  
 (D) It is impossible to tell



3. The follower is at its highest position between points  
 (A) Q and R  
 (B) R and S  
 (C) S and T  
 (D) T and Q



4. All of the wires are of the same substance, the same diameter, and under the same tension. Which will vibrate at the higher frequency?  
 (A) A  
 (B) B  
 (C) C  
 (D) They will vibrate at equal frequency
5. A man in an elevator is carrying a heavy suitcase. The suitcase will feel heaviest to him when the elevator  
 (A) has not yet started moving  
 (B) is gaining speed in descent  
 (C) is maintaining a rapid steady speed of descent  
 (D) is gaining speed in ascent



6. At which point was the basketball moving slowest?  
 (A) A  
 (B) B  
 (C) C  
 (D) D

# ANSWERS AND EXPLANATIONS

## Test 1: Similarities and Differences Between Objects

### Answers

- |      |      |      |       |       |
|------|------|------|-------|-------|
| 1. D | 4. E | 7. B | 10. A | 13. B |
| 2. B | 5. C | 8. A | 11. B | 14. B |
| 3. E | 6. D | 9. D | 12. C | 15. E |

### Explanations

Arrow points to the position of the particular difference.

