



2017 Academic Challenge

ENGINEERING GRAPHICS TEST – REGIONAL

– This Test Consists of 40 Questions –

Engineering Graphics Test Production Team

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GENERAL DIRECTIONS

Please read the following instructions carefully. This is a timed test; any instructions from the test supervisor should be followed promptly.

The test supervisor will give instructions for filling in any necessary information on the answer sheet. Most Academic Challenge sites will ask you to indicate your answer to each question by marking an oval that corresponds to the correct answer for that question. One oval should be marked to answer each question. Multiple ovals will automatically be graded as an incorrect answer.

Be sure ovals are marked as  , not  ,  ,  , etc.

If you wish to change an answer, erase your first mark completely before marking your new choice.

You are advised to use your time effectively and to work as rapidly as you can without losing accuracy. Do not waste your time on questions that seem too difficult for you. Go on to the other questions, and then come back to the difficult ones later if time remains.

***** Time: 40 Minutes *****

DO NOT OPEN TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO!

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WYSE – Academic Challenge
Engineering Graphics Test (Regional) - 2017

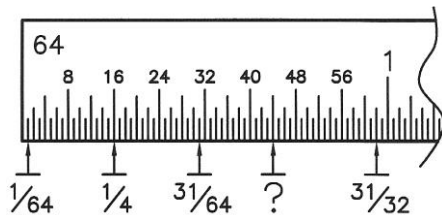
1. According to Wikipedia™, in an article about **drafters**, several specialties are listed. Which of the following is **not** in the common vernacular, and therefore not listed?

- A. Architectural
- B. Construction
- C. Civil
- D. Electronics
- E. Mechanical

2. Most countries have adopted the metric system of units. However, U.S. Customary Units for length such as **inch, foot, yard**, and **mile** are identified within a broad system of units also known as the _____ system.

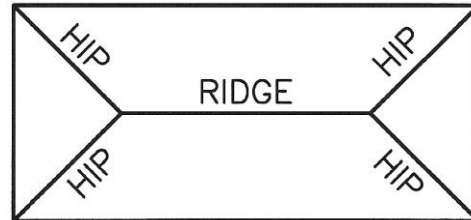
- A. London
- B. Newtonian
- C. Imperial
- D. Pre-metric
- E. Arabic

3. Identify the measurement at the question mark arrow.



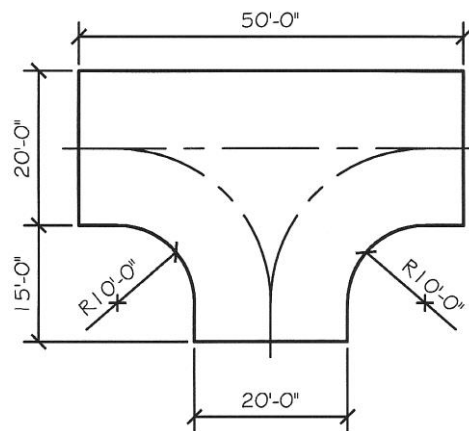
- A. 5/8"
- B. .440"
- C. 23/32"
- D. .625"
- E. 11/16"

4. Given the top view of a house with a 24' x 52' rectangle hip roof [with all slopes the same], how long will the ridge be?



- A. 20'
- B. 24'
- C. 28'
- D. 34'
- E. 40'

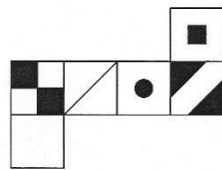
5. To assist with estimating the cost for protective coating, calculate the approximate square footage for the driveway turnaround illustrated below.



- A. 1000 ft²
- B. 1258 ft²
- C. 1300 ft²
- D. 1342 ft²
- E. 1750 ft²

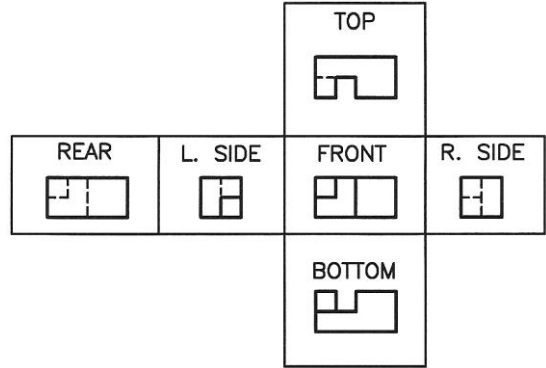
6. Which of the following is not a **polyhedron**?
- A. Sphere
 - B. Triangular Pyramid
 - C. Rectangular Prism
 - D. Cube
 - E. Hexagonal Prism

7. In this test of spatial visualization, which of the cubes is a correct match of the flat pattern foldout?

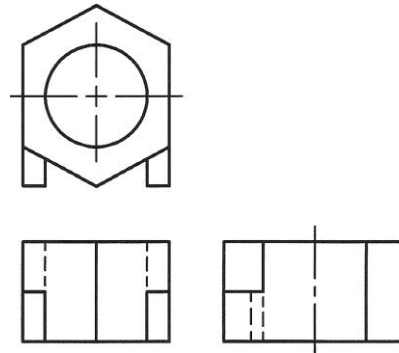


- A.
- B.
- C.
- D.
- E.

8. The illustration below features the six principal views of an object arranged in a standard orthographic glass box development. Which of the views is incorrectly represented?

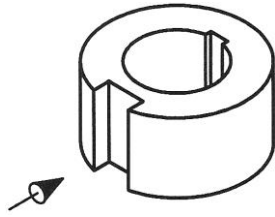


- A. Front
 - B. Bottom
 - C. Right side
 - D. Top
 - E. Rear
9. In this multiview drawing below, how many times did a **visible** line take precedence over a **center** line?



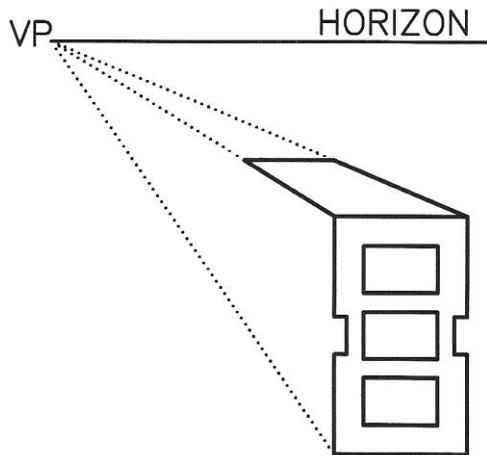
- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

10. The front view direction is indicated. How many hidden lines would there be in a multiview (front, top, and right side) drawing of this part?



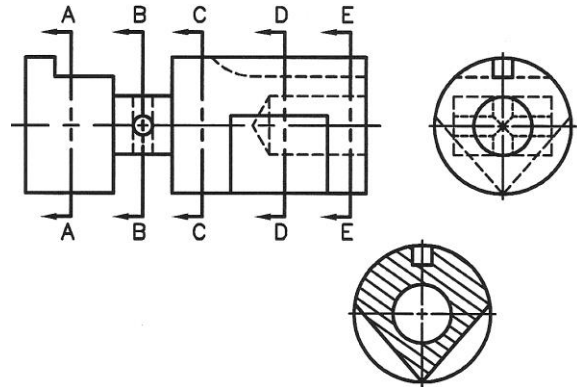
- A. 0
- B. 2
- C. 4
- D. 6
- E. 8

11. Finish the **one-point perspective** drawing of this block. It has three "through" holes, and only one depth dimension. How many line segments are needed to finish the drawing?



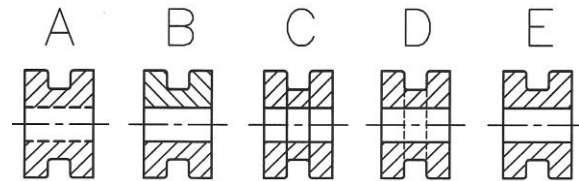
- A. 11
- B. 12
- C. 13
- D. 14
- E. 15

12. For the object illustrated below, which of the cutting planes is associated with the removed section shown?



- A. A-A
- B. B-B
- C. C-C
- D. D-D
- E. E-E

13. Which of the following full section views is correctly drawn?



- A. A
- B. B
- C. C
- D. D
- E. E

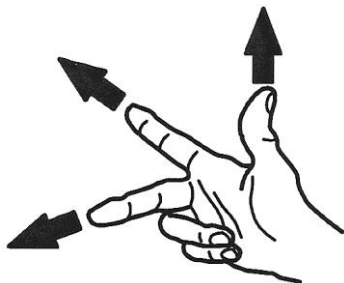
14. What other line has the same appearance as the cutting plane line, but is not placed on the object in the view, but rather is placed adjacent to features or surfaces within a view?

- A. Symmetry line
- B. Stitch line
- C. Viewing Plane line
- D. Short Break line
- E. Long Break line

15. In some textbooks, any auxiliary views projected adjacent to the front view are referred to as _____ auxiliaries because this dimension would always be present in the those views.

- A. Length
- B. Breadth
- C. Width
- D. Depth
- E. Height

16. What aspect of engineering graphics has a "rule" illustrated by the right hand below?

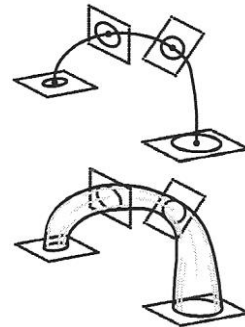


- A. 3D CAD Modeling - Positive axis directions
- B. Orthographic drawing - 3rd angle projection arrangement
- C. Oblique drawing starting corner layout
- D. Springs - tension spring axis layout
- E. Surface quality lay directions

17. With respect to a 3/4" UNC standard threaded bolt, and a 3/4" UNF bolt of the same size, identify the **one** aspect that is common to both:

- A. Thread form
- B. Number of threads per inch
- C. Thread depth
- D. Minor diameter of the thread
- E. Pitch

18. As illustrated below, a 3D modeling technique that generates a model based on shape profiles located along a path:



- A. Repelling
- B. Shaping
- C. Curving
- D. Lofting
- E. Molding

19. The design engineer must be aware of various manufacturing processes and tools. Of the five major process categories listed below, which is the primary category in which a machine known as a **lathe** belongs?

- A. Casting
- B. Molding
- C. Forming
- D. Machining
- E. Joining

20. The words WOODRUFF, SQUARE, PRATT & WHITNEY, GIB-HEAD, and TAPER can all refer to types of _____.

- A. pins
- B. retainer rings
- C. keys
- D. washers
- E. nuts

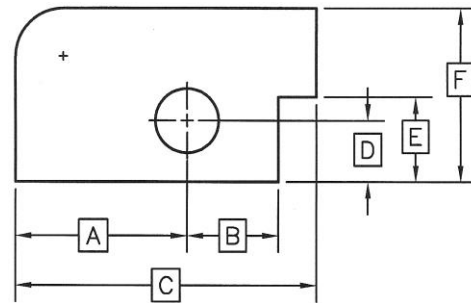
21. The words ALIGNED, ANGULAR, REFERENCE, LINEAR, and BASIC can all refer to types of _____.

- A. auxiliary views
- B. dimensions
- C. section views
- D. tolerances
- E. perspective drawings

22. All of the following are GOOD suggestions for dimensioning except one. Identify the POOR suggestion:

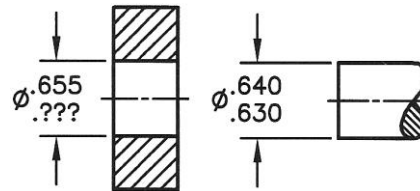
- A. All dimensioning linework should be **thin** and **black**
- B. Keep the dimensions off the object if possible
- C. It is acceptable for extension lines to cross each other
- D. Place longer dimensions further from the object
- E. Create duplicate copies of important and critical dimensions in more than one view

23. How many dimensions must be added to fully dimension the 2D drawing illustrated below?



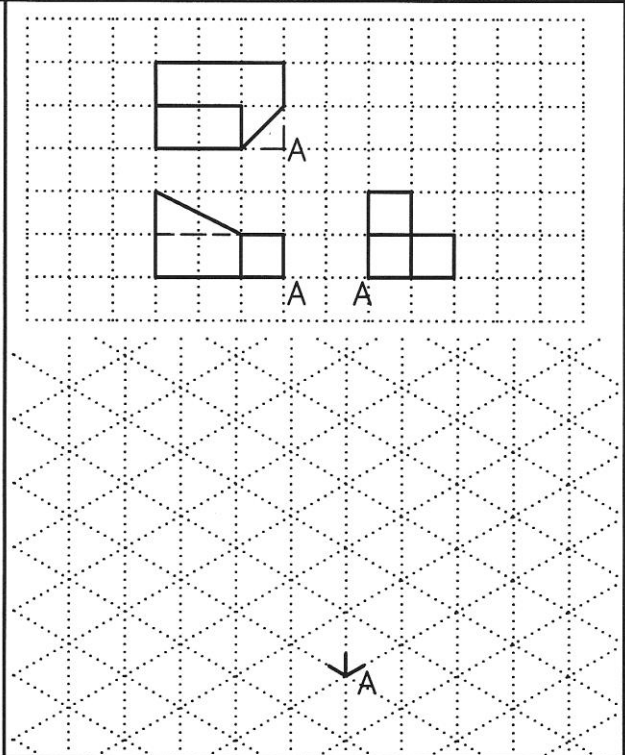
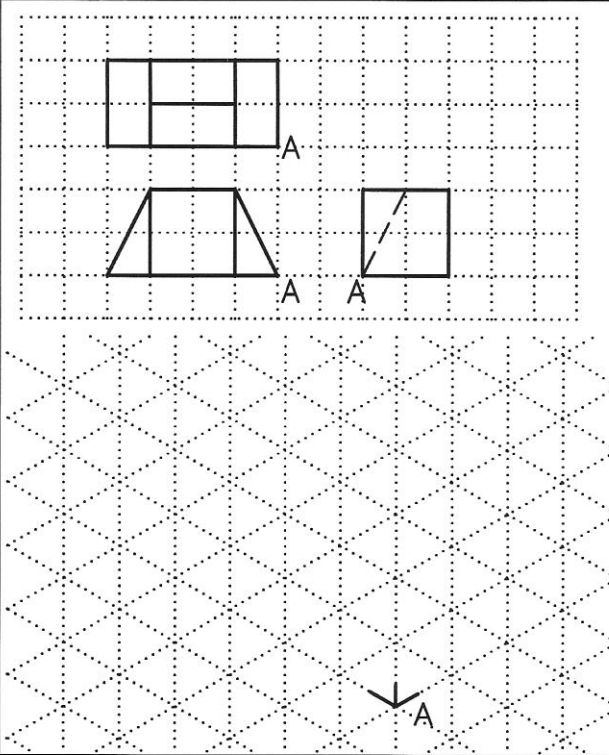
- A. 0
- B. 1
- C. 2
- D. 3
- E. 4

24. What value should be given as the missing hole MMC value so that the range of limits for the hole and pin relationship will be .005" - .025"?



- A. .645"
- B. .650"
- C. .655"
- D. .660"
- E. .665"

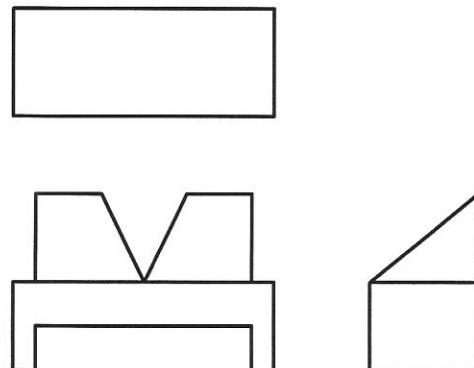
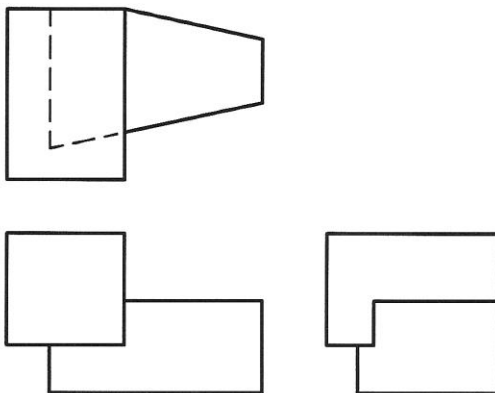
**PROBLEMS 25 & 26: CREATE ISOMETRIC SKETCHES
SELECT AN ANSWER THAT REPRESENTS THE NUMBER OF SEGMENTS REQUIRED**



25. NUMBER OF LINE SEGMENTS:
A. 11 B. 12 C. 13 D. 14 E. 15

26. NUMBER OF LINE SEGMENTS:
A. 12 B. 13 C. 14 D. 15 E. 16

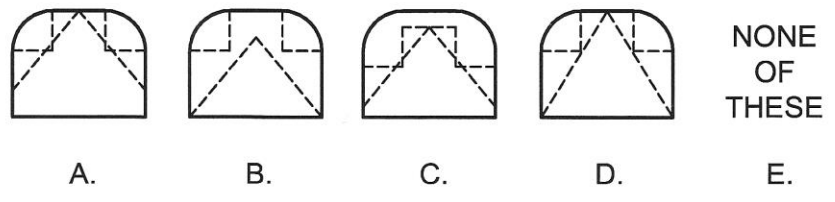
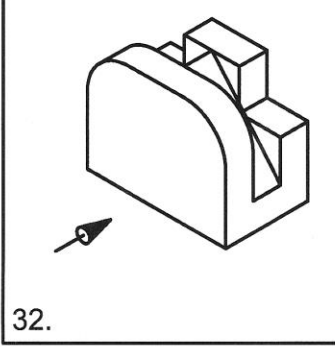
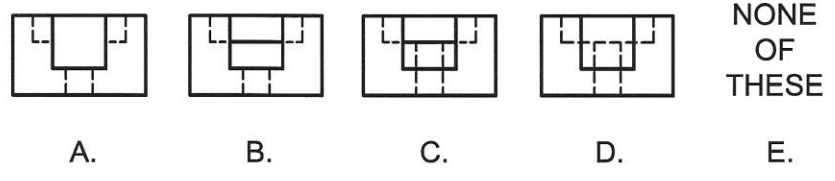
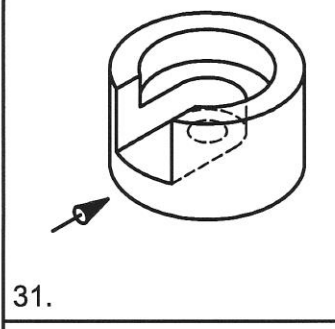
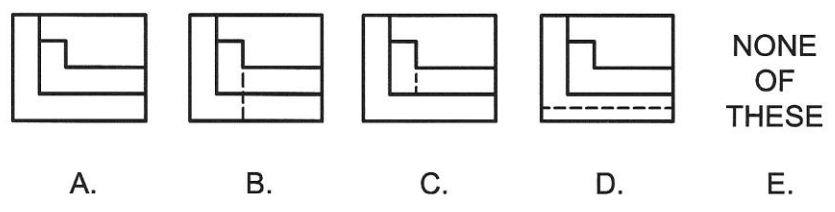
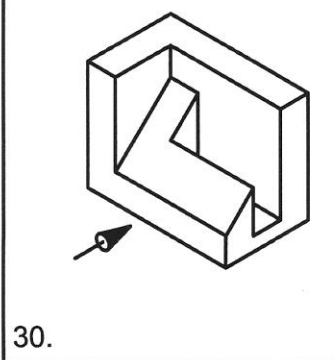
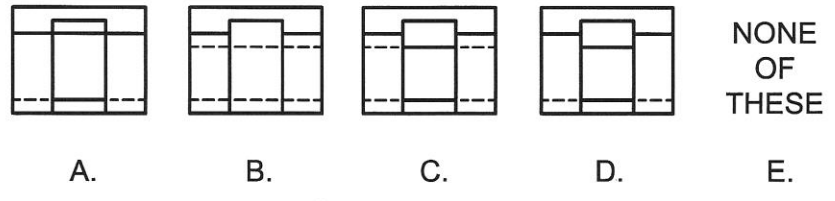
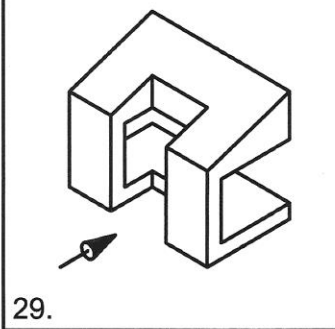
**PROBLEMS 27 & 28: MISSING LINE PROBLEMS: SELECT AN ANSWER THAT
CORRESPONDS WITH THE LEAST NUMBER OF LINE SEGMENTS (VISIBLE AND/OR
HIDDEN) STILL NEEDED TO CREATE A CORRECT AND VALID MULTIVIEW DRAWING**

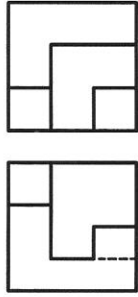

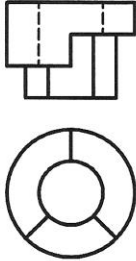
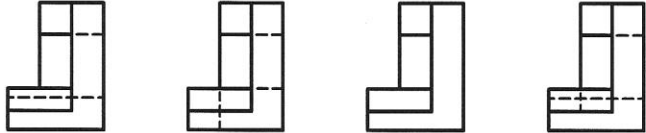
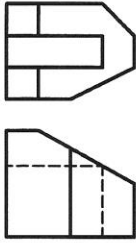
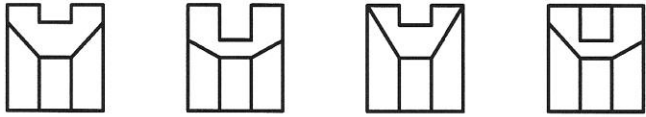
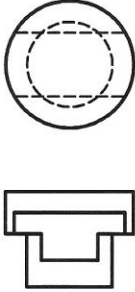
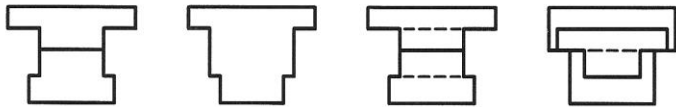


27. MINIMUM NUMBER OF LINES:
A. 3 B. 4 C. 5 D. 6 E. 7

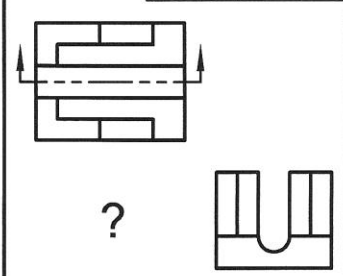
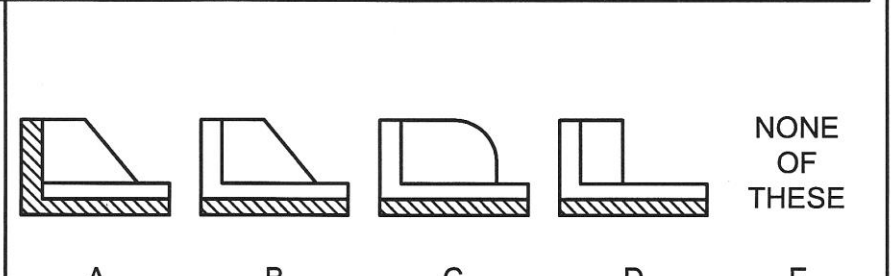
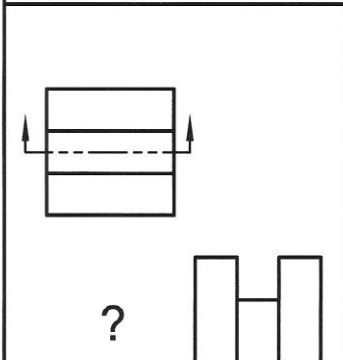
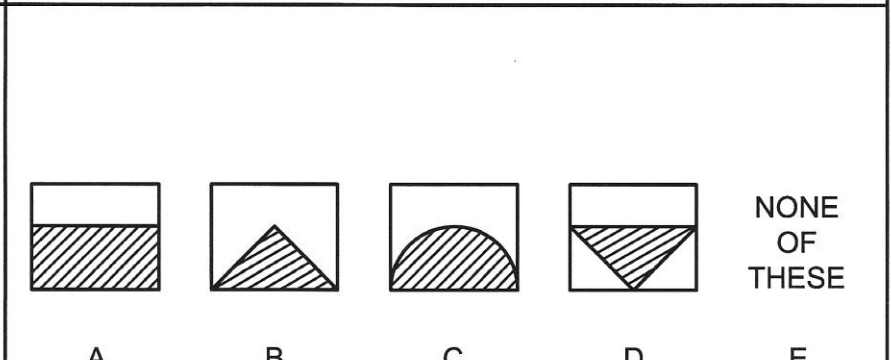
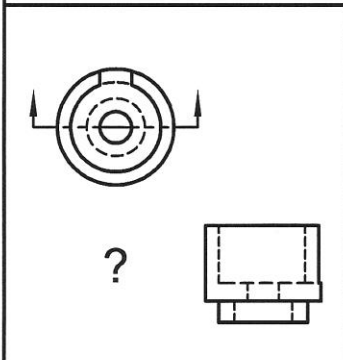
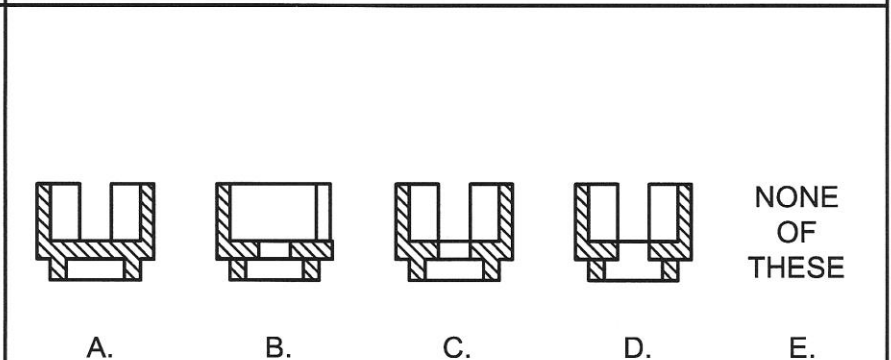
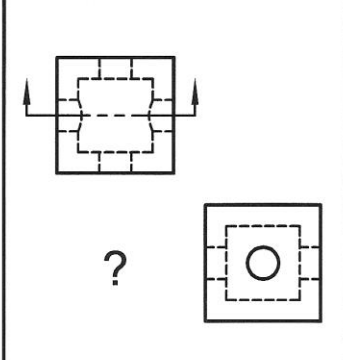
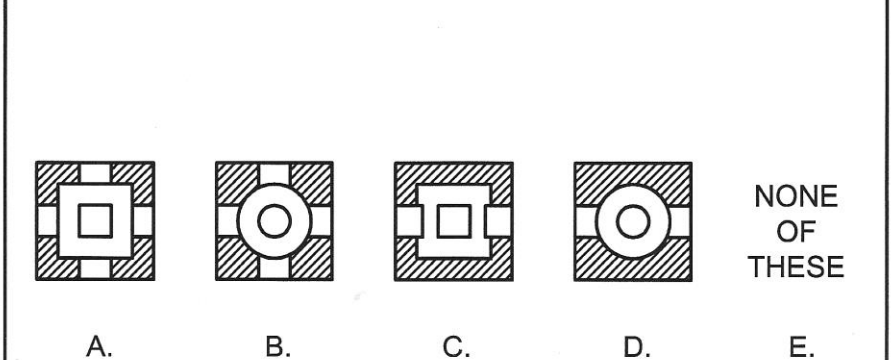
28. MINIMUM NUMBER OF LINES:
A. 2 B. 3 C. 4 D. 5 E. 6

FOR EACH PROBLEM ON THIS PAGE, SELECT A FRONT VIEW
 NOTE: CENTER LINES OMITTED ON THIS TEST



		FOR EACH PROBLEM ON THIS PAGE, SELECT A SIDE VIEW NOTE: CENTER LINES OMITTED ON THIS TEST				
<p>33.</p>  <p>?</p>	 <p>A. B. C. D. E. NONE OF THESE</p>					
<p>34.</p>  <p>?</p>	 <p>A. B. C. D. E. NONE OF THESE</p>					
<p>35.</p>  <p>?</p>	 <p>A. B. C. D. E. NONE OF THESE</p>					
<p>36.</p>  <p>?</p>	 <p>A. B. C. D. E. NONE OF THESE</p>					

FOR EACH PROBLEM ON THIS PAGE, SELECT A FRONT SECTIONAL VIEW
 NOTE: CENTER LINES OMITTED ON THIS TEST

 <p>?</p> <p>37.</p>	 <p>A. B. C. D. E.</p> <p>NONE OF THESE</p>
 <p>?</p> <p>38.</p>	 <p>A. B. C. D. E.</p> <p>NONE OF THESE</p>
 <p>?</p> <p>39.</p>	 <p>A. B. C. D. E.</p> <p>NONE OF THESE</p>
 <p>?</p> <p>40.</p>	 <p>A. B. C. D. E.</p> <p>NONE OF THESE</p>