



2012 Academic Challenge

ENGINEERING GRAPHICS TEST – SECTIONAL

– This Test Consists of 40 Questions –

Engineering Graphics Test Production Team

Ryan Brown, Illinois State University – Author/Team Leader

Jacob Borgerson, Independent Consultant – Reviewer

Mary Weaver, WYSE – Coordinator of Test Production

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 (Sectional) - 2012

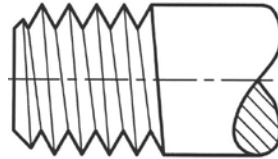
1. An engineering graphics specialist must be aware that standard paper sizes exist for two groups: engineers and _____.
- A. designers
 - B. welders
 - C. architects
 - D. machinists
 - E. technologists

2. Which of the following is the official diameter of a half dollar coin?



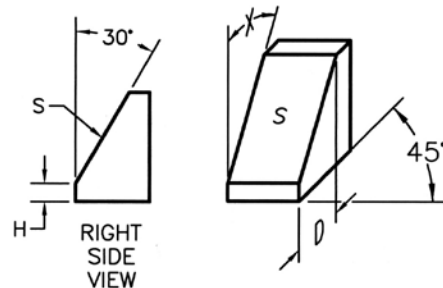
- A. 1.0625"
 - B. 1.2050"
 - C. 1.2500"
 - D. 1.3750"
 - E. 1.4375"
3. As used in engineering graphics, which of the following words best describes the word **tolerance**?
- A. fit
 - B. allowance
 - C. part
 - D. cost
 - E. variation

4. What is the **included angle** (i.e. between sides of thread) of this thread form?



- A. 15°
- B. 30°
- C. 45°
- D. 60°
- E. 75°

5. Given Dimension H and Surface S = 30° inclined, which statement describes the drafter's rule for the pictorial drawing?

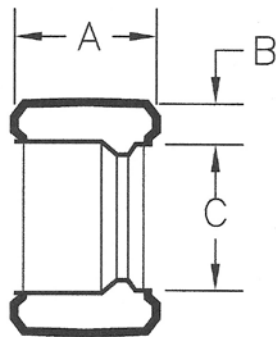


- A. The edges of Surface S will slope 30° (Angle X) in the pictorial also.
- B. The edges of Surface S need to be determined by Dimension D, not by an angle.
- C. The pictorial Angle X will be greater than 30°.
- D. The edges of Surface S are 60° from horizontal.
- E. The edges of Surface S are 75° from horizontal.

6. How many points of tangency exist in the design illustrated below?

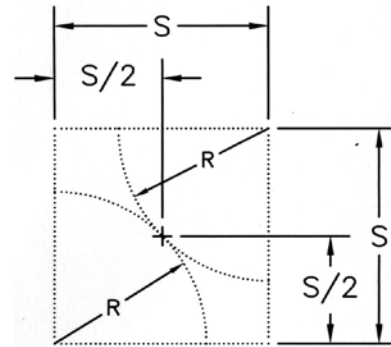


- A. 2
 B. 3
 C. 4
 D. 5
 E. 6
7. According to a technical drawing in a car tire handbook, a 235/60R15 rubber tire is 235mm wide (A), and the sidewall width ratio is 60%, so the sidewalls are about 141mm (B). The metal wheel rim is specified as 15" (C). In inches, what is the approximate tire diameter?

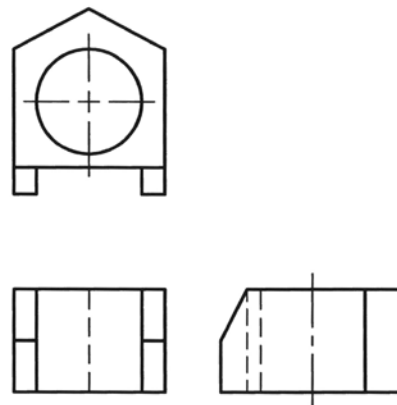


- A. 19"
 B. 21"
 C. 24"
 D. 26"
 E. 28"

8. The illustration below shows Step 1 for the geometric construction of a(n) _____ inside a square. Note: the next step is to construct two more arcs of the same radius using the other two corners of the square.

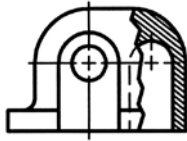


- A. ellipse
 B. octagon
 C. pentagon
 D. ogee curve
 E. spiral
9. In this multiview drawing below, how many times did a **visible** line take precedence over a **hidden** line or **center** line?

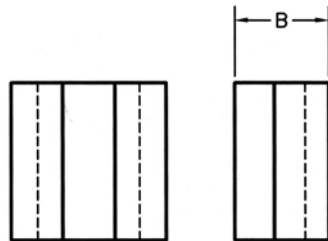


- A. 0
 B. 1
 C. 2
 D. 3
 E. 4

10. Of the types of lines standardized for engineering drawings, which of the following is NOT shown in the illustration below?

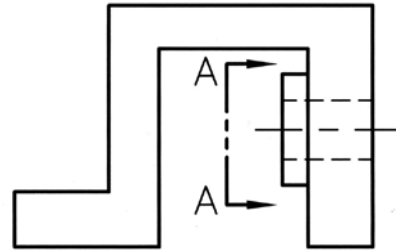


- A. Section
 - B. Center
 - C. Cutting plane
 - D. Hidden
 - E. Visible
11. In industrial practice, views aren't named, but are always lined and organized in relationship to each other. In this case illustrated below, if Dimension A is considered "height", what term should be applied to Dimension B?



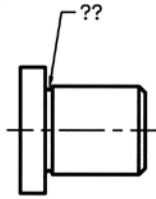
- A. Width
- B. Length
- C. Depth
- D. Breadth
- E. Height

12. In the conventional practice shown below, viewing-plane line A-A is being implemented to indicate there is a _____ view.



- A. pictorial
 - B. removed
 - C. section
 - D. auxiliary
 - E. hidden
13. Within the realm of dimensioning, ALIGNED is to FRACTIONS as _____ is to DECIMALS.
- A. UNIDIRECTIONAL
 - B. TAPERED
 - C. ANGLED
 - D. VERTICAL
 - E. HORIZONTAL
14. The annotations of a drawing are scaled and sized to be legible and neat when printed to paper. If the plot scale is changed from 1:1 to 1:4, which of the following does NOT have to be adjusted?
- A. Hidden (dashed) lines
 - B. Section line spacing
 - C. Lettering height
 - D. Dimension arrowheads
 - E. Fillets and rounds

15. What name is given to the undercut groove indicated in this illustration?

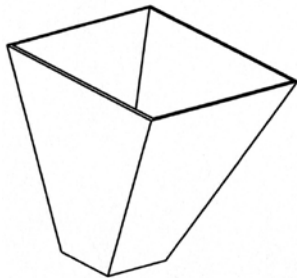


- A. Knurl
- B. Chamfer
- C. Neck
- D. Keyway
- E. Spline

16. With respect to mating parts, a type of fit wherein Part A has to be pressed or forced into Part B is called a(n) _____ fit.

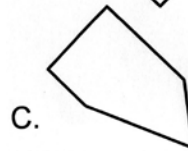
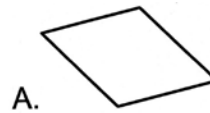
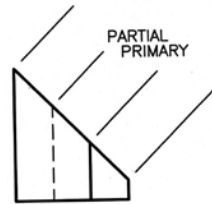
- A. clearance
- B. transition
- C. line
- D. actual
- E. interference

17. The design of this feed hopper would be an application of design involving the _____ of a pyramid.



- A. development
- B. welding
- C. transition
- D. creation
- E. boring

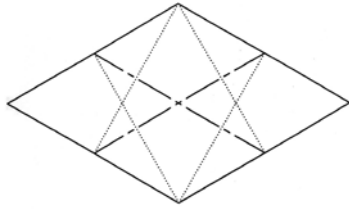
18. Which one of the views below could be a partial primary auxiliary view of the inclined surface projected from the front view in this illustration?



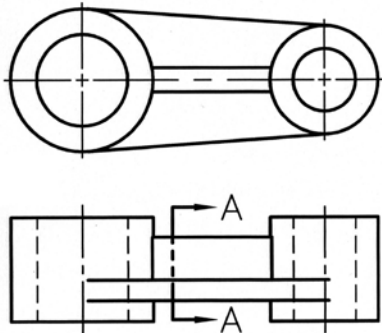
19. Most CAD systems have a "FILLET" command that rounds off corners (and automatically trims), and a _____ command that could bevel a corner.

- A. SNAP
- B. CHAMFER
- C. TRACE
- D. PAN
- E. BREAK

20. The construction shown is a(n) _____-center ellipse method that is handy for constructing ellipses when sketching isometric pictorials.

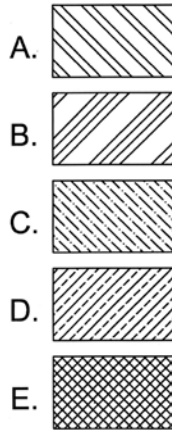


- A. ortho
 B. octo
 C. two
 D. iso
 E. four
21. Which type of section will most likely be used to show the shape of the material at cutting plane A-A?

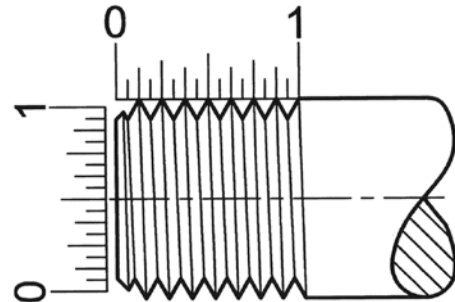


- A. Offset
 B. Aligned
 C. Removed
 D. Half
 E. Broken-out

22. Which section line pattern of “hatching” is representative of bronze or brass parts?

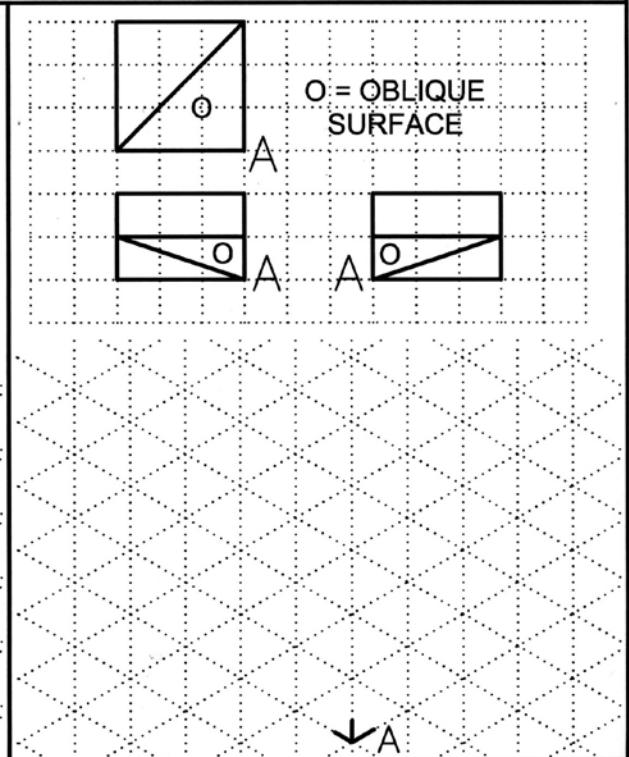
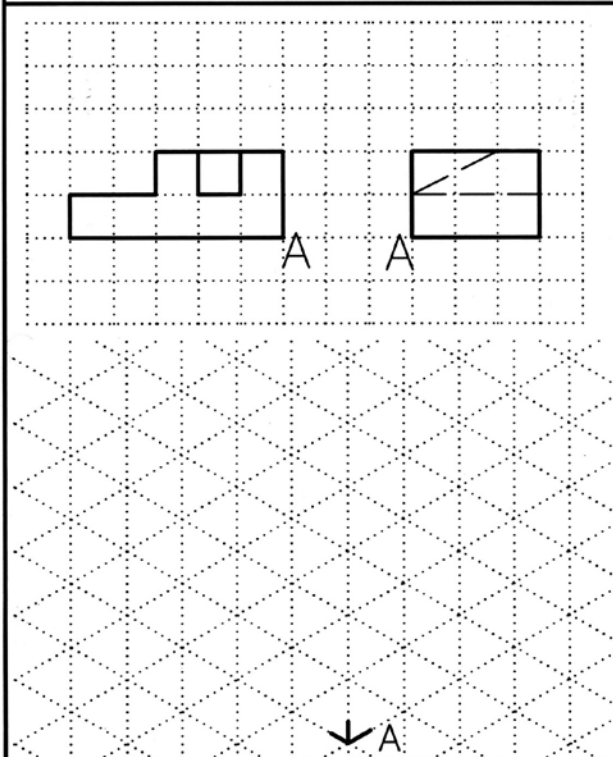


23. What is the pitch of the screw thread illustrated below?



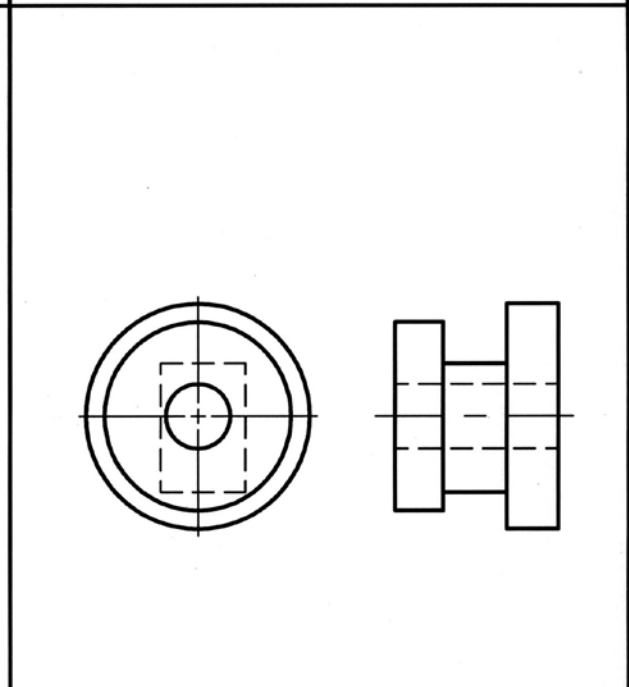
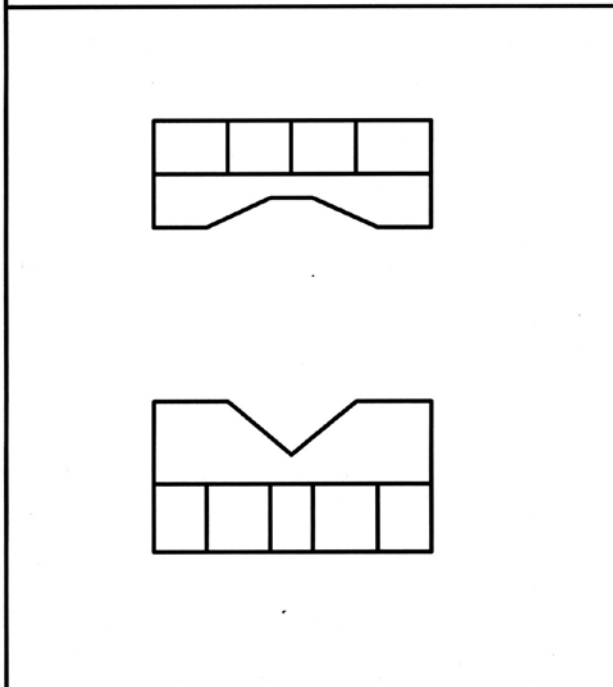
- A. .0625"
 B. .125"
 C. .200"
 D. .250"
 E. .375"
24. In dimensioning, which of the following words is represented by an alphabetic character instead of a symbol?
- A. DEEP
 B. SQUARE
 C. DIAMETER
 D. COUNTERBORE
 E. RADIUS

PROBLEMS 25 & 26: CREATE ISOMETRIC SKETCHES.
 PROBLEMS 27 & 28, DIMENSION COMPLETELY, BUT NO SUPERFLUOUS.



25. NUMBER OF LINE SEGMENTS:
 A. 15 B. 17 C. 19 D. 21 E. 23

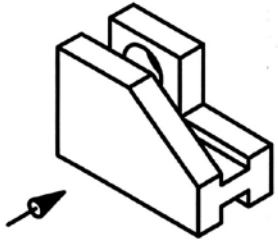
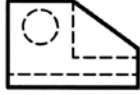

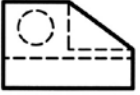

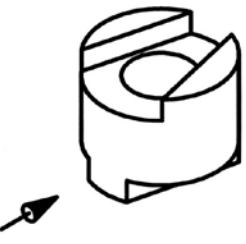
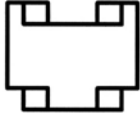
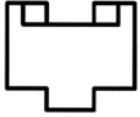
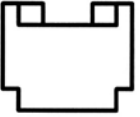
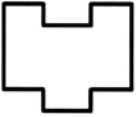
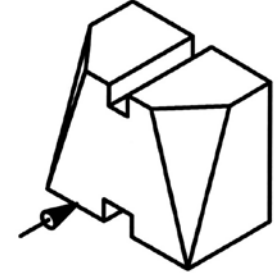




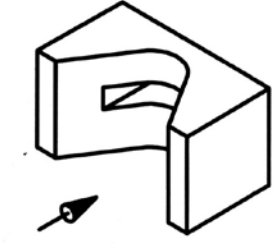




26. NUMBER OF LINE SEGMENTS:
 A. 10 B. 11 C. 12 D. 13 E. 14

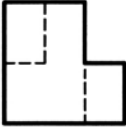

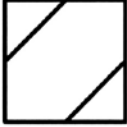
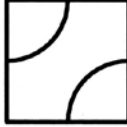
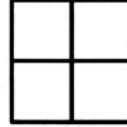

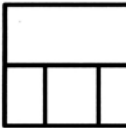
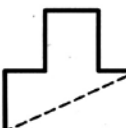
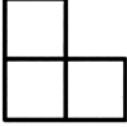
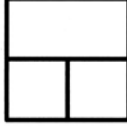
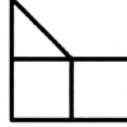
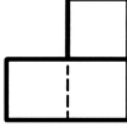
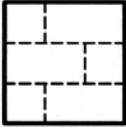

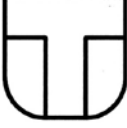

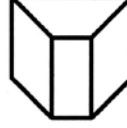

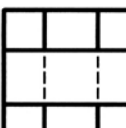

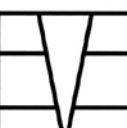
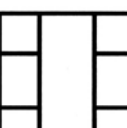
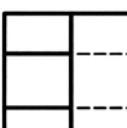
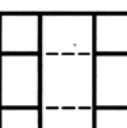


27. MINIMUM NUMBER OF DIMENSIONS:
 A. 10 B. 11 C. 12 D. 13 E. 14

28. MINIMUM NUMBER OF DIMENSIONS:
 A. 8 B. 9 C. 10 D. 11 E. 12

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

<p>29.</p> 	<div style="display: flex; justify-content: space-around; align-items: center;">     </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> A. B. C. D. NONE OF THESE </div>
<p>30.</p> 	<div style="display: flex; justify-content: space-around; align-items: center;">     </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> A. B. C. D. NONE OF THESE </div>
<p>31.</p> 	<div style="display: flex; justify-content: space-around; align-items: center;">     </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> A. B. C. D. NONE OF THESE </div>
<p>32.</p> 	<div style="display: flex; justify-content: space-around; align-items: center;">     </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> A. B. C. D. NONE OF THESE </div>

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

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

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