ENGR 1182  |  Midterm Exam 1: Study Guide and Practice Problems

Disclaimer

Problems seen in this study guide may resemble problems relating mainly to the pertinent homework assignments. Reading this study guide and solving the practice problems is not a sufficient level of studying for this exam. Students should also review the relevant reading material and PowerPoint slides as questions will be asked from those places as well. Please remember that the number of “show your work” practice problems exceeds the number of “show your work” exam problems.

Study Guide: Exam 1, ENG 1182 – AU15

The following restrictions apply:

- The exam will be closed book.
- No Computer Storage Devices.
- No Calculators.
- No Cell Phones.
- No Internet access.

The exam will consist of four problems:
- a coded plan problem (10 points)
- a problem to create an isometric drawing of a given orthographic drawing (15 points)
- a problem to create orthographic views from an isometric drawing (15 points)
- a surface / edge / point tracking problem (10 points)

Topics Covered:

Visualization:

- Understand Coded Plans
- Given a coded plan, be able to create an isometric drawing of the object as seen from any given corner

Isometric Drawing:

- Understand the use of the three coordinate axes in an isometric drawing
- Recognize normal (principal) and inclined surfaces
- Given an isometric view of an object, be able to create the isometric view as seen from a different direction (i.e. the object as seen when rotated)
- Given and isometric view of an object, be able to locate the three coordinates of points in isometric and then transfer the information to a set of orthographic views.

Orthographic Views:

- Know the conventional layout of orthographic drawings
- Know drawing conventions, including line types and line precedence
- Be able to identify how surfaces, edges and points correspond between the different views of a set of orthographic drawings

**Content Review**

- Below is contained the content and learning objectives that will be tested on this exam. Not all learning objectives will be tested exactly as read, however students should use this material to keep track of what they need to be reviewing.

Graphics

  a. Isometric Sketches
  b. Coded Plans
  c. Inclined, Curved and Oblique Surfaces
  d. Orthographic Projections
  e. Hidden Lines
  f. Point, Line, Edge and Surface Tracking
  g. Skills associated with providing Missing Lines
  h. Skills associated with providing Missing Views
Associated learning objectives

- Students will use coded plans to draw objects in an isometric view
- Students will be able to draw holes and determine visibility of backs of holes
- Students will be able to use multiple views of an object to determine where to include hidden lines in orthographic projections
- Students will be able to apply principles of orthographic projection to identify corresponding points, edges, and surfaces between orthogonal views
- Students will be able to produce the isometric sketch from an object’s set of orthographic projections
- Students will be able to create a corresponding set of orthographic projections from an object in isometric view
- Students will be able to incorporate inclined planes and curved features into isometric sketches
- Students will be able to create orthographic projections of objects with inclined and curved features
- Students will be able to add center marks and centerlines to orthographic drawings
Practice Problems

Directions: Make an isometric drawing for the item shown in the orthographic drawing below. One unit length in the orthographic drawing should correspond to one unit length on the isometric grid. Do not include centerlines. The point A is given for reference.
**Directions:** On the rectilinear grid make a set of orthographic drawings for the object shown in the isometric drawing. **The vertical hole has a bottom 2 units down!**
Directions: Make an isometric drawing for the item shown in the orthographic drawing below. The point A is given for reference.
Directions: On the rectilinear grid make a set of orthographic drawings for the object shown in the isometric drawing. NOTE point A is given for reference.
1. (2 points) The face on the object shown below is what kind of surface?

   a) Inclined  
   b) Oblique  
   c) Principal

2. (3 points) Circle the appropriate answer(s).

   In a set of orthographic projections, the top view of an object shows
   
   i) width  
   ii) height  
   iii) depth

3. (2 points) If the coordinates of point A in the following isometric are X=0, Y=0, and Z=0 and the grid points are 1 unit apart, what is the location of point B?

   a) X=5, Y=2, Z=5  
   b) X=2, Y=5, Z=5  
   c) X=5, Y=5, Z=2  
   d) X=2, Y=2, Z=5

4. (2 points) Which of the following is a correctly drawn isometric according to the rules given in class?

5. (2 point) A hole that is not drilled all the way through an object is called:

   a) partial  
   b) through  
   c) blind  
   d) oblique
6. (2 points) What kind of surface is not parallel to any principal plane of projection and can be seen with its characteristic shape in all three views of a standard orthographic drawing?
   a) Inclined
   b) Oblique
   c) Normal
   d) True-Length

7. (2 points) If a line appears as a point in one view of a standard three view orthographic drawing (you are looking directly down the line), then
   a) The line will appear as a line in the other two views
   b) The line will appear as a point in both the other two views
   c) The line will appear as a point in one other view and a line in the other
   d) None of the above

8. (2 points) Which of the following is a correctly drawn isometric according to the rules given in class?

![Isometric Sketches]

9. (2 points) A hole that is not drilled all the way through an object is called a ________ hole and hidden lines ________ be used to show this feature on an isometric drawing.
   a) partial, may
   b) partial, may not
   c) blind, may
   d) oblique, may
   e) blind, may not

10. (2 points) ________ sketches present the object in one projection, showing ________ of the objects’ three dimensions.
    a) Orthographic; two
    b) Pictorial; two
    c) Orthographic; three
    d) Pictorial; three
    e) Orthographic; one