MS-101 (MAKERSPACE)

Spring 2025

IIT Bombay

LAB (1) - VISUALIZATION

20 Points

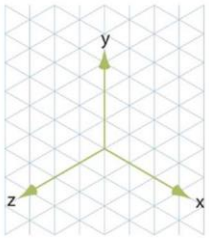
NAME:

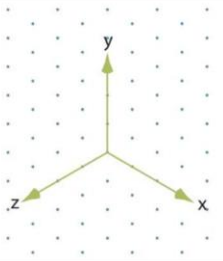
RLL NO:

DEPARTMENT:

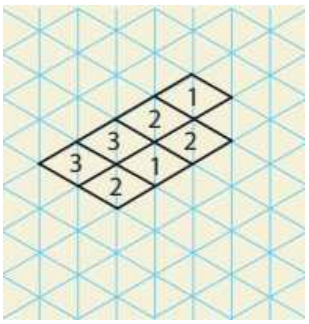
BATCH:

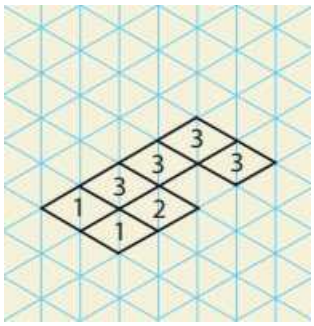
Important: Use the right-handed coordinate system, as shown here, for all solutions.

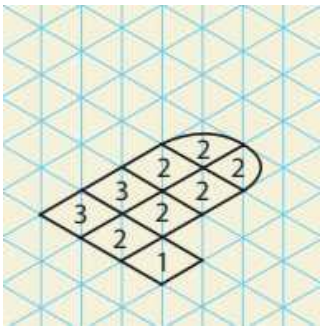




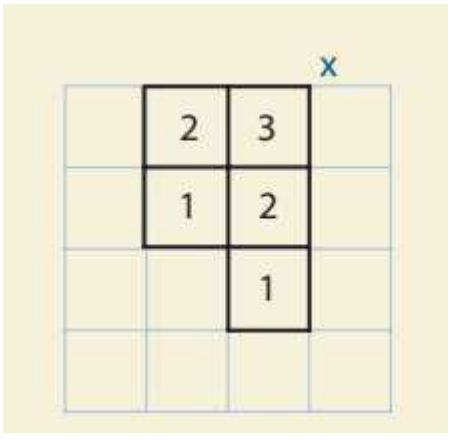
1. [2 points] On isometric grid paper, create isometric sketches of the following objects.
   (a) A 6×6×3 block with a through hole of diameter 4 centered on the 6×6 side.
   (b) A cylinder of diameter 4 and length 6 with its longitudinal axis parallel to the y-axis.
2. [3 points] On isometric grid paper, create isometric sketches from the following coded plans. (Note: the numbers indicate the height of the blocks)

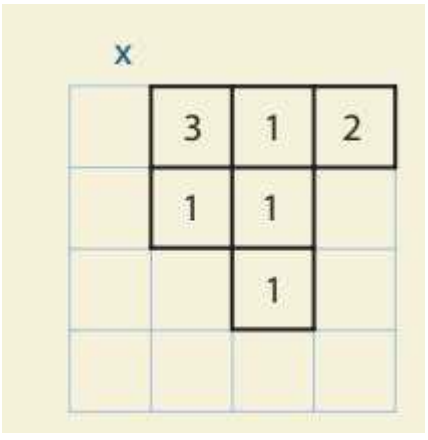
(a) 

(b) 

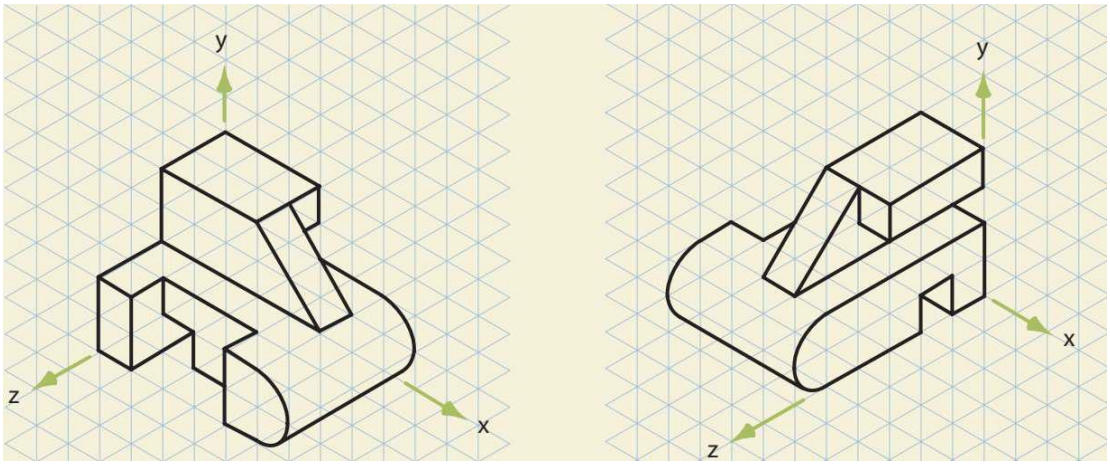
(c) 

3. [3 points] On isometric grid paper, sketch the indicated corner view (marked with an X) as per the given coded plans.

(a) 

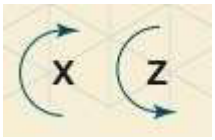
(b) 

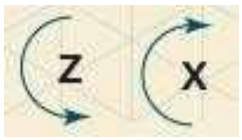
4. [4 points] The object shown (left) is rotated by -90 degrees about the y-axis to obtain the rotated view (right). Such a rotation reveals more details about the object. Note that only the object rotates, while the coordinate axes remain fixed.



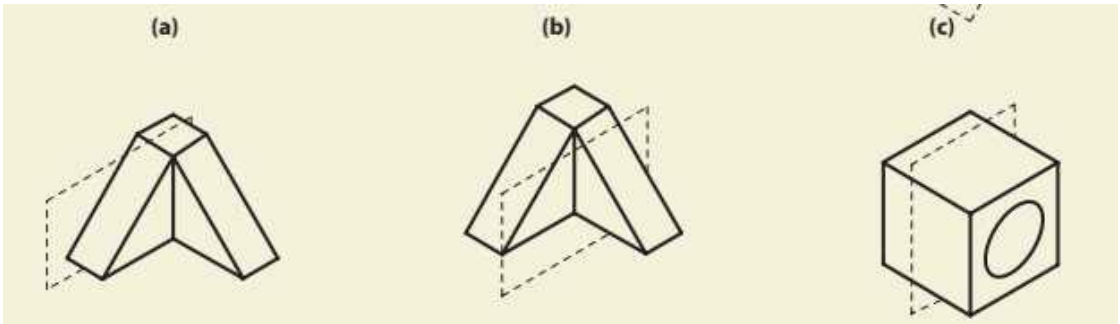
Similarly, rotate the object sequentially in increments of 90 degrees about the axes indicated.

Arrows indicate the direction of rotation. <u>Sketch the results of each rotation for both sections (a & b)</u> on isometric grid paper.

(a) 

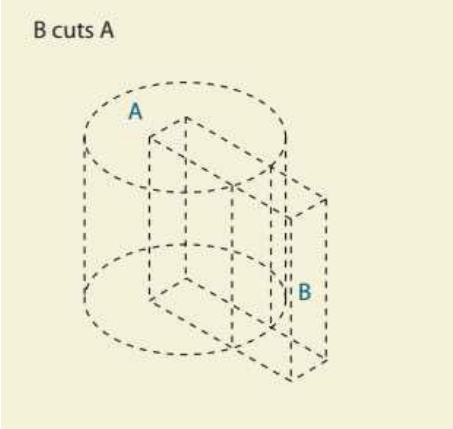
(b) 

5. [3 points] Sketch the cross-section obtained between the intersection of the object and the corresponding cutting plane shown. **<u>Draw on top of the object image itself.</u>**

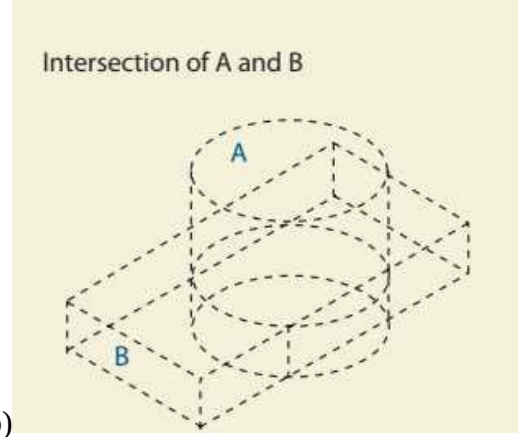


6. [2 points] Sketch (on top of the given figures) the result of combining the following objects by the indicated method.

(a)



(b)



7. [3 points] Triangular volume A, triangular volume B, and rectangular volume C are shown intersecting in space. On the dashed outline drawings, darken and add edges to show all visible edges of the final volume created by the indicated Boolean operations.