MS101 – MAKERSPACE

Spring 2023

IIT Bombay

LAB 1 – VISUALIZATION

20 POINTS

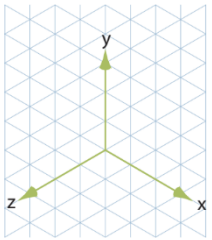
NAME:

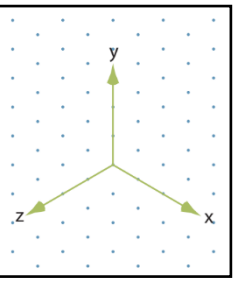
ROLL NO.:

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 5×5×5 block.

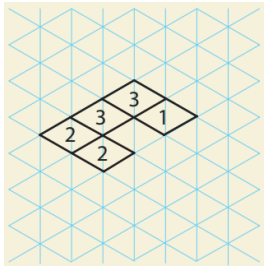
(b) a 6×6×3 block with a hole of diameter 4 on the 6×6 side.

(c) a cylinder of diameter 4 and length 6 with its longitudinal axis parallel to the x-axis.

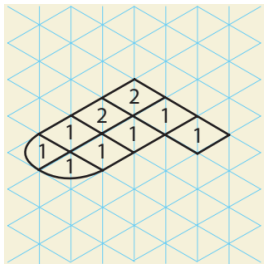
(d) a cylinder of diameter 4 and length 6 with its longitudinal axis parallel to the y-axis.

2. [3 points] On isometric grid paper, create isometric sketches from the following coded plans.

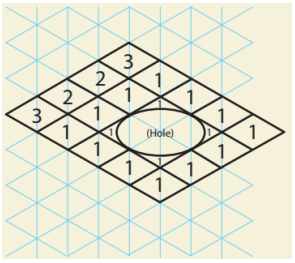
(a)



(b)

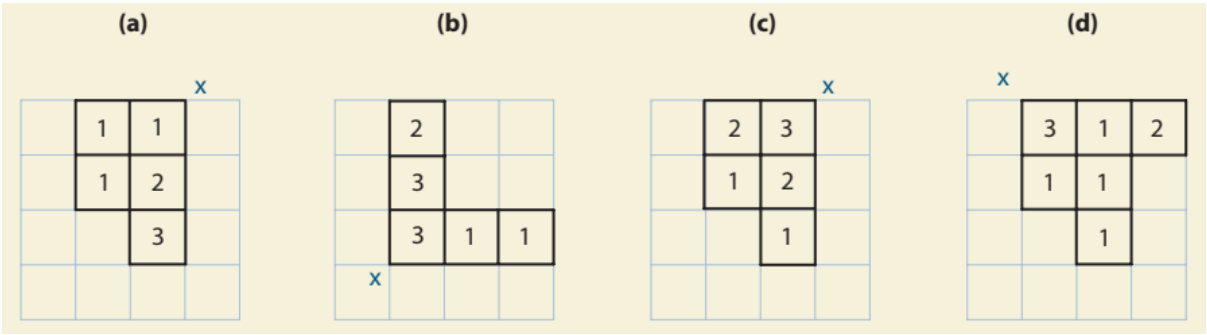


(c)

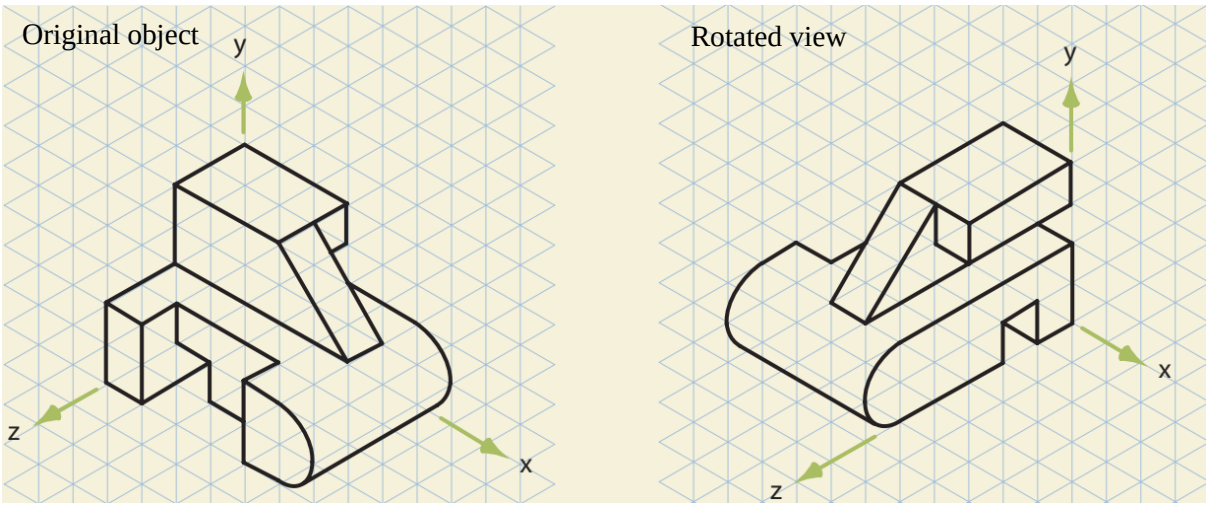


3. [3 points] On isometric grid paper, create an isometric sketch of the object provided to you, clearly showing all features such as round corners, buttons, switched, casing etc. as applicable.

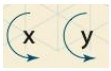
4. [2 points] On isometric grid paper, sketch the indicated corner view (marked with an ×) as per the given coded plans.

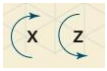


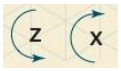
5. [2 points] The object shown (left) is rotated by -90 degrees about the y-axis to obtain the rotated view (right). Such a rotation reveals more details about the object.

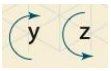


Similarly, rotate the object sequentially in increments of 90 degrees about the axes indicated. Arrows indicate the direction of rotation. Sketch the results on isometric grid paper.

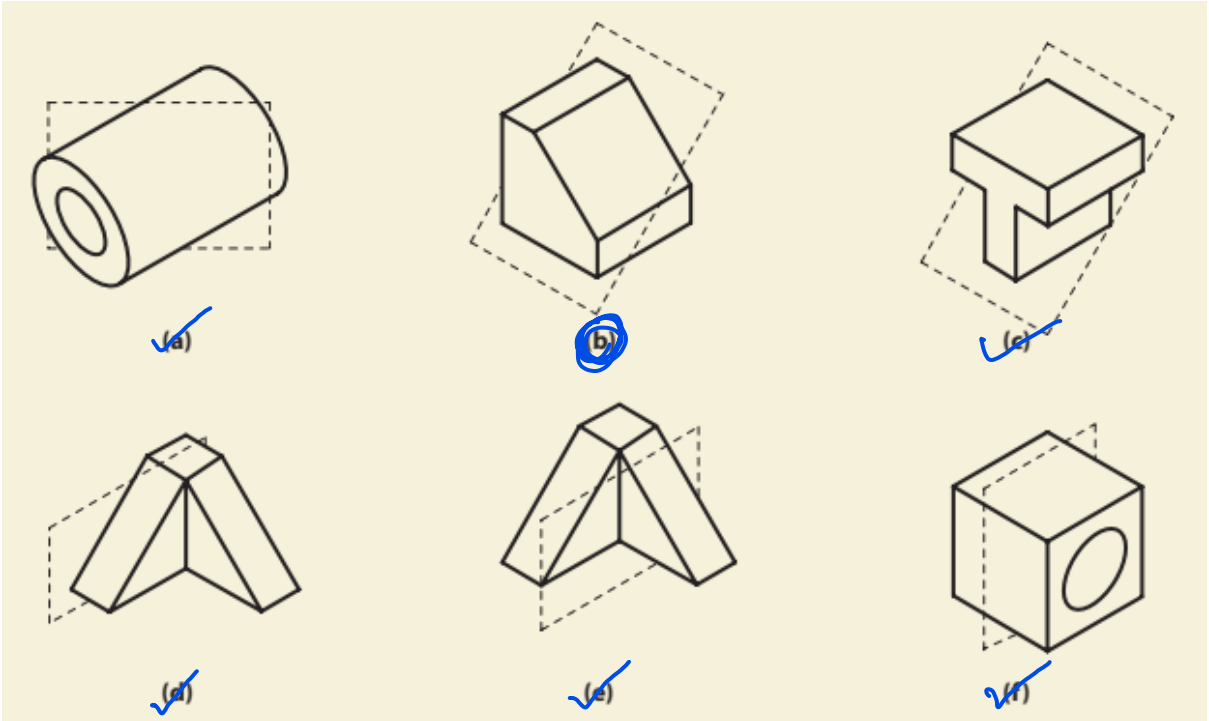
i. 

ii. 

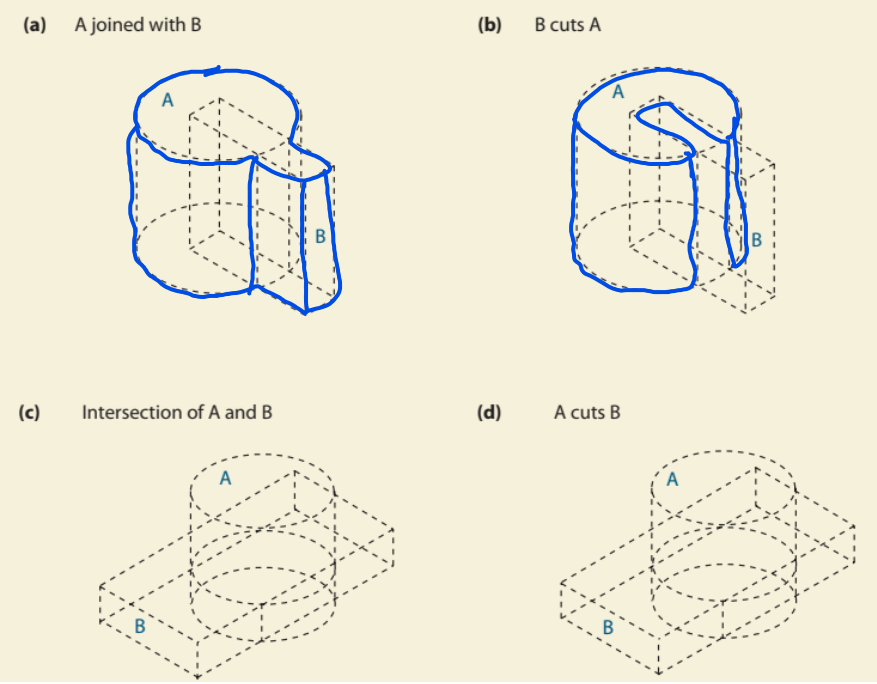
iii. 

iv. 

6. [3 points] Sketch the cross-section obtained between the intersection of the object and the corresponding cutting plane shown. Draw on top of the given figure.



7. [2 points] Sketch (on top of the given figures) the result of combining the following objects by the indicated method.



How the hell are they positioned? Does A intersect with boundary of B only at one edge?

8. [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.