1. Exercise : 6 Week - 8 2. Date: 13/12/2020

3. Title : Combinations of solids, CSG, and advanced solid modelling.

4. Aim : To model simple combination of solids by Constructive Solid Geometry (CSG), and some advanced models using sweep, loft, shell solid models and obtain their projections.

5. Software used: AutoCAD - 2020

6. Introduction: CSG, Advanced solid modelling

CSG - It allows a modeler to create a complex surface or object using Boolean operators to combine simpler objects, potentially generating visually complex objects. They are done mostly by combining a few primitive objects and figures.

6.2 CSG sketch):

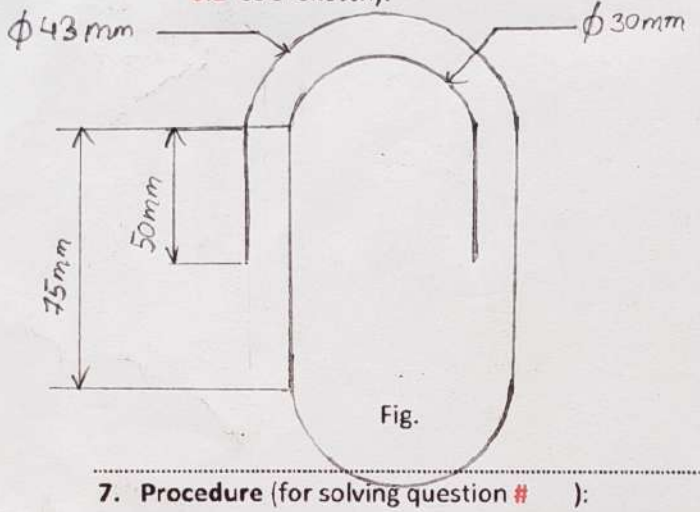
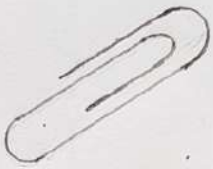


Fig.

6.2 Real time example - Picture



Paper pin

Fig.

7. Procedure (for solving question #):

7.1 Question outline : Draw the layout of the above CSG sketch

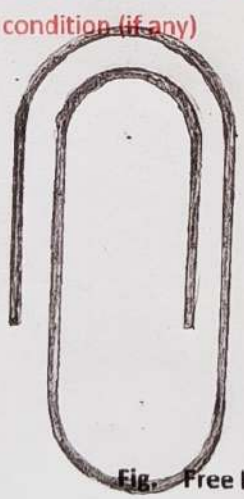
7.2 Object : Given figure

7.3 Resting on Conditions : Resting on Horizontal Plane.

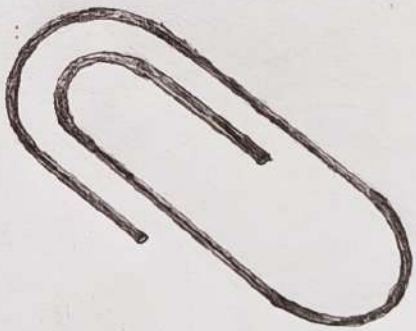
7.4 Other resting condition (if any) :

7.5 Other condition (if any) :

Front View



Top View



Isometric View & Side View

Fig. Free hand sketch of the solution to question #

7.3 **Stepwise procedure:**

Step 1.

After selecting suitable 'Units', 'Limits' and 'zoom', remove grid view and from workspace switching, select '3D Modelling'.

Step 2: In Top View, using 'ortho', draw four straight lines parallel to each other. Alternate ones should be of length 50 mm and 75 mm.

Step 3: Using '2-point circle' draw circles joining the outer-most lines and inner two lines. Then using 'Trim' command, erase the unwanted parts of circle. Use 'sweep' to select a circle of smaller radius and sweep the path to give 3D appearance. Then draw the layouts.

8. **Commands used:**

S.N.	Command	Use
1.	UNITS	To set precision to 0.
2.	LIMITS	To set boundaries of workspace.
3.	ZOOM	To zoom to required space.
4.	ORTHO	To draw straight lines
5.	2-point Circle	To draw circles joining two lines.
6.	JOIN	To join the objects into single object
7.	SWEEP	To create a 3D solid or surface by sweeping a 2D or 3D curve along a path.

9. **Result:**

Using the above commands and following the above procedure, the given solid object is successfully created using AutoCAD-2020.

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Signature		Marks	