

1. Exercise : 7

Week - 7

2. Date: _____

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

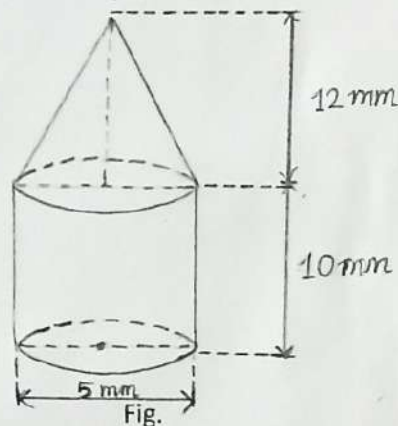
4. Aim : To model simple combination of solids by Constructive Solid Geometry (CSG), and some advanced models using sweep, loft, shell solid models and obtain their projections.

5. Software used: AutoCAD-20

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. These are done mostly by combining a few primitive objects and figures.

6.2 CSG sketch):



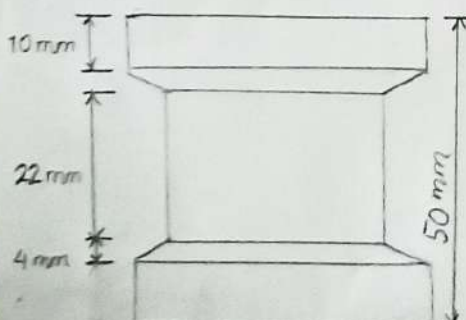
6.2 Real time example - Picture



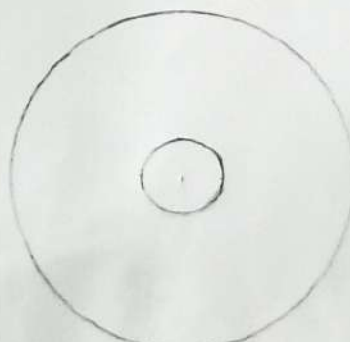
A Pencil
Fig.

7. Procedure (for solving question #):

- 7.1 Question outline : Draw the figure of dimension 30 revolved 360° on axis
- 7.2 Object : Thread bobbin
- 7.3 Resting on Conditions : Rests on HP in front view
- 7.4 Other resting condition (if any) : -
- 7.5 Other condition (if any) : Distance from axis is 6 mm revolved 360° on axis-



Front View



Top View



Isometric View

Fig. Free hand sketch of the solution to question #

7.6 Procedure:

Step 1.

After selecting suitable 'Units', 'Limits' and 'Zoom', remove grid view and from workspace switching, switch to '3D Modelling'.

Step 2: Draw the given layout in front view using 'ortho' and 'line' commands.

Step 3: Draw a straight line as axis 6mm away from left of the drawn layout.

Step 4: Use 'Revolve' command to select object and the axis line and enter rotation angle as 360° . Using 'union' command, unify the final object as one.

Step 5: Using 'View' and selecting 'Base', select 'From Model Space'. After that select the object from model & from 'Front View', 'Side View', 'Top View' and 'Isometric View'. Give a suitable name for the final layouts.

8. Commands used:

S.N.	Command	Use
1.	UNITS	To set precision to 0
2.	LIMITS	To set boundaries of work space.
3.	ZOOM	To zoom to required space.
4.	ORTHO	To draw straight lines.
5.	LINE	To draw lines
6.	REVOLVE	To revolve the 2D layout into 3D layout.
7.	UNION	To merge the parts of layout as one single unified layout/object
8.	DIMENSIONS	To give dimensions to object.

9. Result:

Using the above commands and following the above procedure, the given object (assumably a cylinder) is successfully created using AutoCAD - 2020

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Signature		Marks	