

26-10. THREE DIMENSIONAL DRAWINGS

Module 26-43. Draw a three dimensional diagram as shown in fig. 26-55. Use 3D commands such as Region, Extrude and Subtract.

To draw a three dimensional diagram using the steps mentioned below. After executing the commands in sequence, we will get the output as shown in fig. 26-55(i) to fig. 26-55(vii).

- (1) Command: **LIMITS** (↵)
Reset Model space limits:
Specify lower left corner or [ON/OFF] <0.0000,0.0000>: (↵)
Specify upper right corner <12.0000,9.0000>: **120,90** (↵)

- (2) Command: **ZOOM** (↵)
Specify corner of window, enter a scale factor (nX or nXP), or
[All/Center/Dynamic/Extents/.....] <real time>: **ALL** (↵)

- (3) Create 2D diagram (fig. 26-55(i)) Using **Pline** command, take Coordinate of P1 as **0,0**

- (4) Command: **VPOINT** (↵)

Current view direction: VIEWDIR =
0.0000,0.0000,1.0000

Specify a view point or [Rotate] <display compass and tripod>: **1,-1,1** (↵)

- (5) Command: **REGION** (↵)

Select objects: (Select any Line)

Select objects: (↵)

1 loop extracted.

1 Region created.

- (6) Command: **SHADEMODE** (↵)

Enter an option [2dwireframe/3dwireframe/3dHidden/Realistic/Conceptual/Other] <Conceptual>: **H** (↵)

- (7) Command: **EXTRUDE** (↵)

Current wire frame density: ISOLINES=4

Select objects: (Select any line)

Select objects: (↵)

Specify height of extrusion or [Path]: **40** (↵)

- (8) Command: **ROTATE3D** (↵)

Current positive angle: ANGDIR = counterclockwise
ANGBASE=0

Select objects: (Select Solid S1)

Select objects: (↵)

Specify first point on axis or define axis by

[Object/Last/View/Xaxis/Yaxis/Zaxis/2points]: **X** (↵)

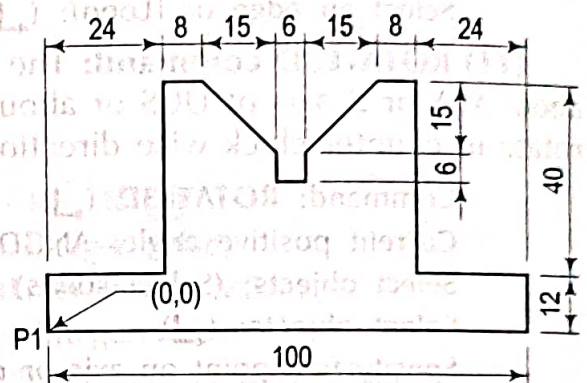


FIG. 26-55(i)

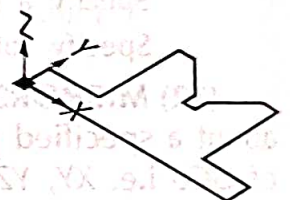


FIG. 26-55(ii)

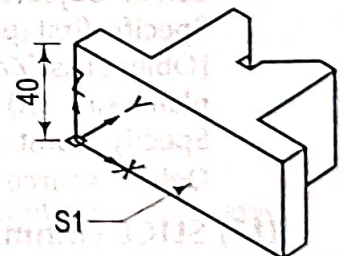


FIG. 26-55(iii)

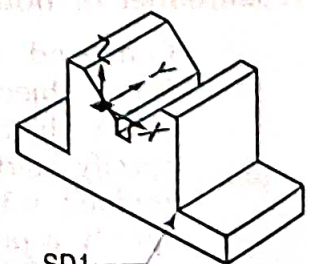


FIG. 26-55(iv)

Specify a point on the X axis <0,0,0>: (↵)
 Specify rotation angle or [Reference]: 90 (↵)

(9) Command: **ZOOM** (↵)

Specify corner of window, enter a scale factor (nX or nXP), or
 [All/Center/Dynamic/Extents/.....] <real time>: ALL (↵)

(10) Command: **UCS** (↵)

Current ucs name: *TOP*

Enter an option [New/Move/orthoGraphic/...] <World>: M (↵)

Specify new origin point or [Zdepth]<0,0,0>: (Select Point **SD1**)

(11) Command: **CIRCLE** (↵)

Specify center point for circle or [3P/2P/Ttr (tan tan radius)]: 12,20 ()

Specify radius of circle or [Diameter]: D (↵)

Specify diameter of circle: 13 (↵)

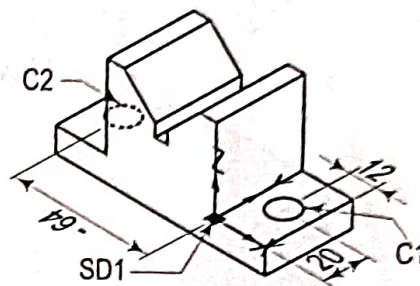


FIG. 26-55(v)

(12) Command: **CIRCLE** (↵)

Specify center point for circle or [3P/2P/Ttr (tan tan radius)]: -64,20 (↵)

Specify radius of circle or [Diameter] <0.6500>: D (↵)

Specify diameter of circle: 13 (↵)

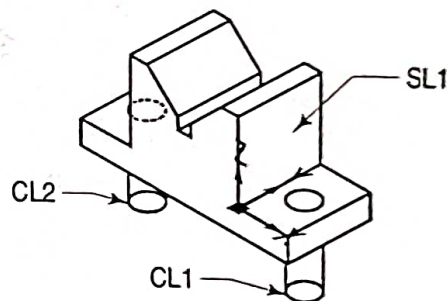


FIG. 26-55(vi)

(13) Command: **EXTRUDE** (↵)

Current wire frame density: ISOLINES=4

Select objects: (Select Circle **C1**)

Select objects: (Select Circle **C2**)

Select objects: (↵)

Specify height of extrusion or [Path]: -40 (↵)

(14) Command: **SUBTRACT** (↵)

Select solids and regions to subtract from ..

Select objects: (Select Solid **SL1**)

Select objects: (↵)

Select solids and regions to subtract ..

Select objects: (Select Cylinder **CL1**)

Select objects: (Select Cylinder **CL2**)

Select objects: (↵)

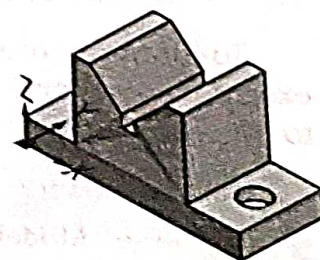


FIG. 26-55(vii)

(15) Command: **SHADEMODE** (↵)

Enter an option [2dwireframe/3dwireframe/3dHidden/Realistic/Conceptual/Other] <Conceptual>: C (↵)

(16) Save This File As **Module 26-43.DWG**

Output of Module 26-43 (fig. 26-55):

MODULE 26-43: USE OF 3D COMMANDS REGION, EXTRUDE AND SUBTRACT

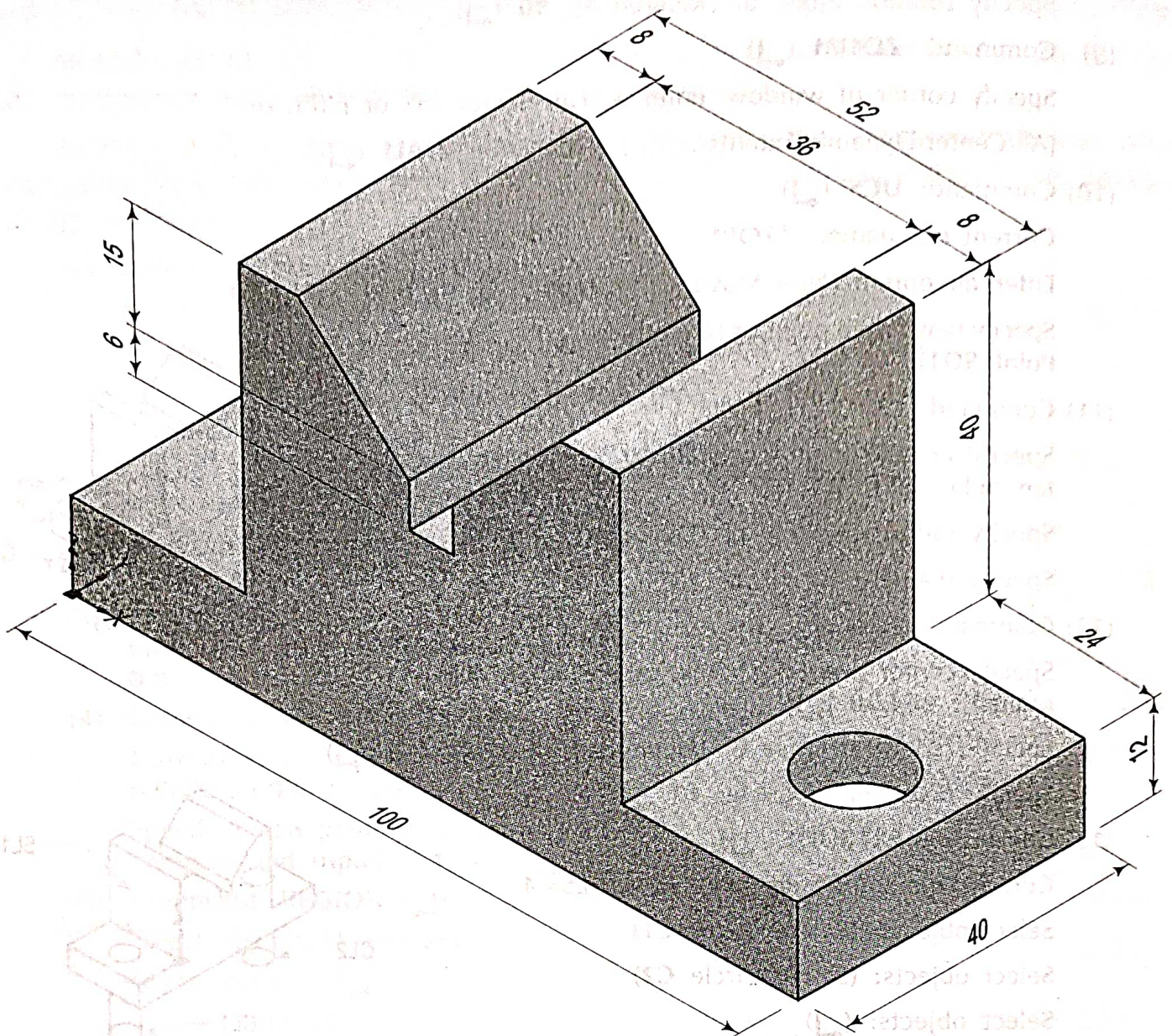


FIG. 26-55

Module 26-44. Draw a three dimensional diagram as shown in fig. 26-56. Use 3D commands such as *Region*, *Revolve* and *Fillet*.

To draw a three dimensional diagram using the steps mentioned below. After executing the commands in sequence, we will get the output as shown in fig. 26-56(i) to fig. 26-56(iv).

(1) Command: **LIMITS** (↵)

Reset Model space limits:

Specify lower left corner or [ON/OFF] <0.0000,0.0000>: (↵)

Specify upper right corner <12.0000,9.0000>: **360,270** (↵)

(2) Command: **ZOOM** (↵)

Specify corner of window, enter a scale factor (nX or nXP), or

[All/Center/Dynamic/Extents/Previous/Scale/Window] <real time>: **ALL** (↵)

Regenerating model.

(3) Using **PLINE** Command Create 2D diagram (fig. 26-56(i)), take co-ordinate of **P1 0,0**

(4) Command: **VPOINT** (↵)

Current view direction: VIEWDIR = 0.0000,0.0000,1.0000

Specify a view point or [Rotate] <display compass and tripod>: **1,-1,1** (↵)

Regenerating model.

(5) Command: **REGION** (↵)

Select objects: (Select any Line)

Select objects: (↵)

1 loop extracted.

1 Region created.

(6) Command: **SHADEMODE** (↵)

Enter an option [2dwireframe/3dwireframe/3dHidden/Realistic/...] <Conceptual>: **H** (↵)

(7) Command: **REVOLVE** (↵)

Current wire frame density: ISOLINES=4

Select objects to revolve: (Select any Line)

Select objects to revolve: (↵)

Specify axis start point or define axis by [Object/X/Y/Z] <Object>: **X** (↵)

Specify angle of revolution or [Start angle] <360>: **360** (↵)

(8) Command: **ZOOM** (↵)

Specify corner of window, enter a scale factor (nX or nXP), or

[All/Center/Dynamic/Extents/Previous/Scale/Window] <real time>: **ALL** (↵)

(9) Command: **FILLET** (↵)

Current settings: Mode = TRIM, Radius = 0.0000

Select first object or [Polyline/Radius/Trim]: (Select Edge **E1**)

Enter fillet radius: **6** (↵)

Select an edge or [Chain/Radius]: (↵)

1 edge(s) selected for fillet.

(10) Command: **SHADEMODE** (↵)

Enter an option [2dwireframe/3dwireframe/3dHidden/Realistic/...] <Conceptual>: **C** (↵)

(11) Save this File as **Module 26-44.DWG**

Output of Module 26-44 (fig. 26-56):

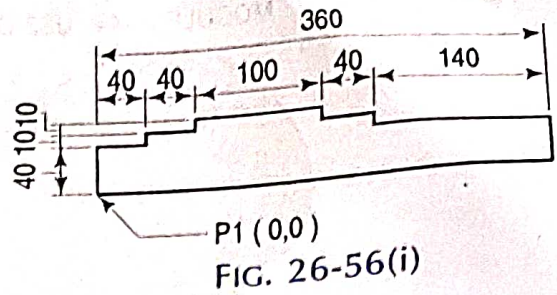


FIG. 26-56(i)

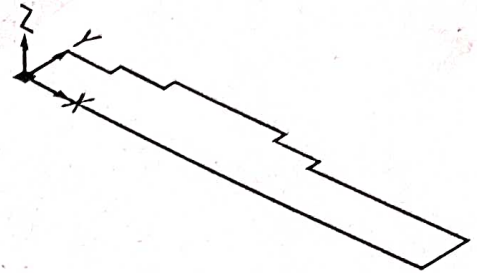


FIG. 26-56(ii)

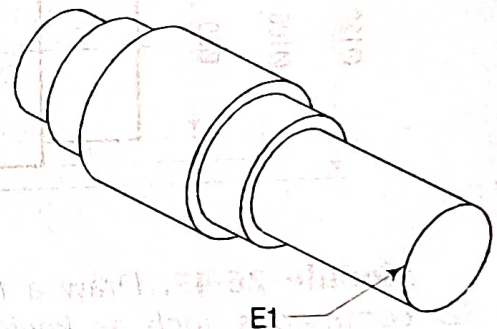


FIG. 26-56(iii)

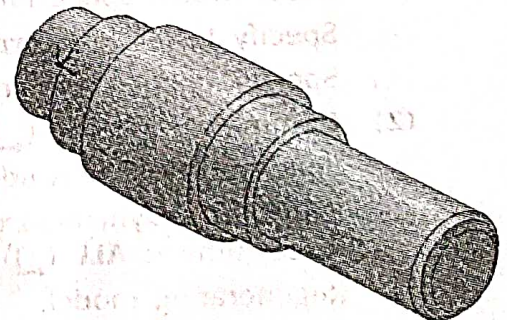


FIG. 26-56(iv)

MODULE 26-44: USE OF 3D COMMANDS REGION, REVOLVE AND FILLET

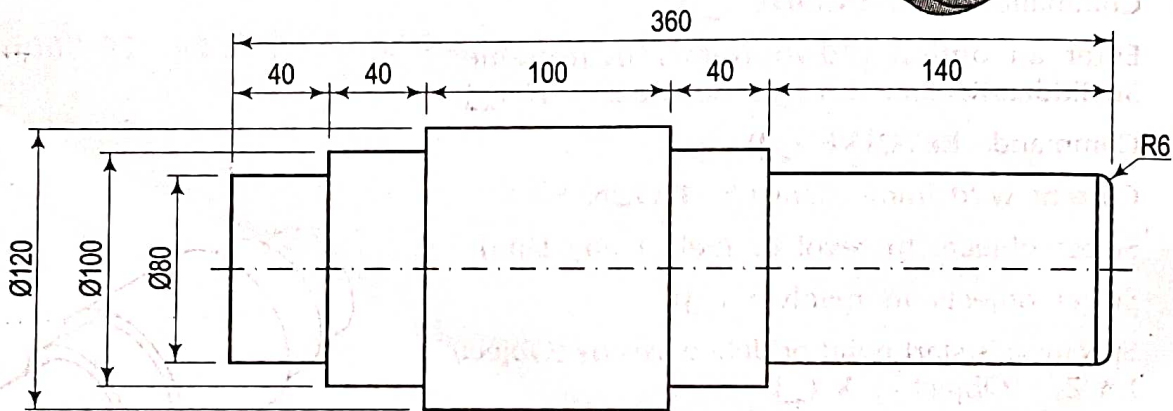
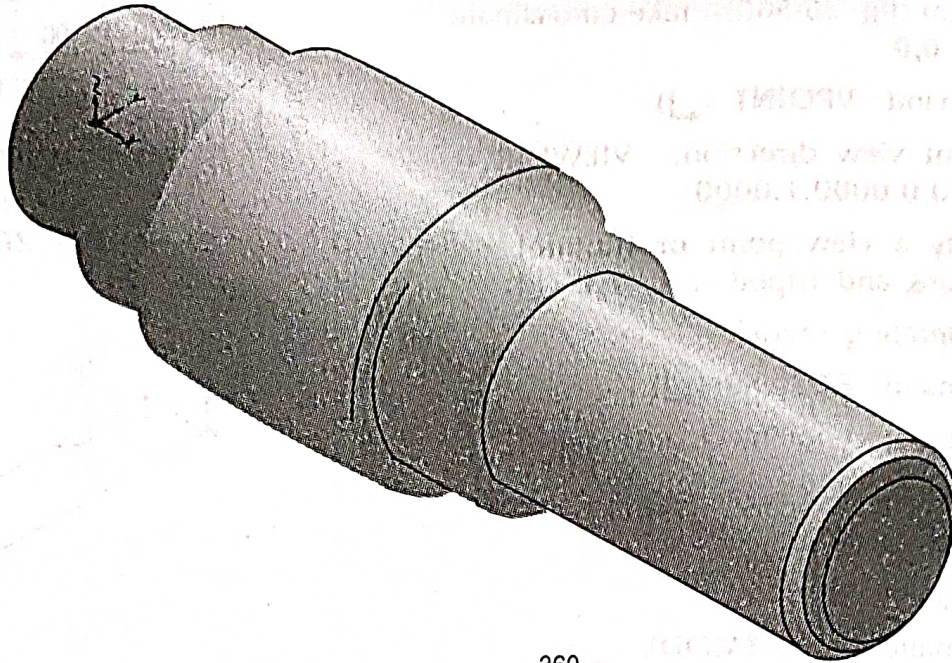


FIG. 26-56

Module 26-45. Draw a three dimensional diagram as shown in fig. 26-57. Use 3D commands such as Region, Extrude and Union.

To draw a three dimensional diagram using the steps mentioned below. After executing the commands in sequence, we will get the output as shown in fig. 26-57(i) to fig. 26-57(ix).

- (1) Command: **LIMITS** (↵)
 Reset Model space limits:
 Specify lower left corner or [ON/OFF] <0.0000,0.0000>: (↵)
 Specify upper right corner <12.0000,9.0000>: **600,450** (↵)
- (2) Command: **ZOOM** (↵)
 Specify corner of window, enter a scale factor (nX or nXP), or [All/Center/Dynamic/Extents/Previous/Scale/Window]
 <real time>: **ALL** (↵)
 Regenerating model.
- (3) Command: **RECTANGLE** (↵)
 Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]: **0,0** (↵)
 Specify other corner point or [Dimensions]: **0,0**
@100,50 (↵)

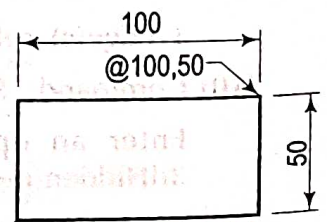


FIG. 26-57(i)

(4) Command: **VPOINT** (↵)
 Current view direction: VIEWDIR=0.0000,0.0000,1.0000
 Specify a view point or [Rotate] <display compass and tripod>: **1,-1,1** (↵)
 Regenerating model.

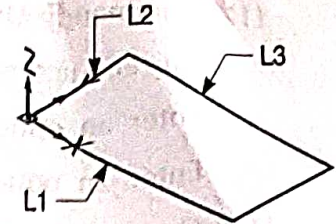


FIG. 26-57(ii)

(5) Command: **FILLET** (↵)
 Current settings: Mode = TRIM, Radius = 0.0000
 Select first object or [Polyline/Radius/Trim]: **R** (↵)
 Specify fillet radius <0.0000>: **25** (↵)
 Select first object or [Polyline/Radius/Trim]: (Select **L1**)
 Select second object: (Select **L2**)

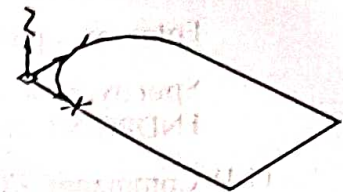


FIG. 26-57(iii)

(6) Command: **FILLET** (↵)
 Current settings: Mode = TRIM, Radius = 25.0000
 Select first object or [Polyline/Radius/Trim]: (Select **L2**)
 Select second object: (Select **L3**)

(7) Command: **CIRCLE** (↵)
 Specify center point for circle or [3P/2P/Ttr (tan tan radius)]: (Select CENTER magnet **C1**)
 Specify radius of circle or [Diameter]: **D** (↵)
 Specify diameter of circle: **24** (↵)

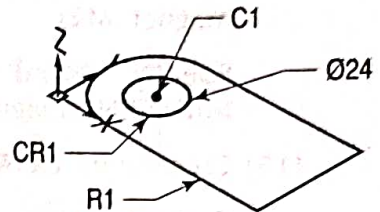


FIG. 26-57(iv)

(8) Command: **EXTRUDE** (↵)
 Current wire frame density: ISOLINES=4
 Select objects to extrude: (Select Rectangle **R1**)
 Select objects to extrude: (↵)
 Specify height of extrusion or [Direction/Path/Taper angle] <40.0000>: **40** (↵)

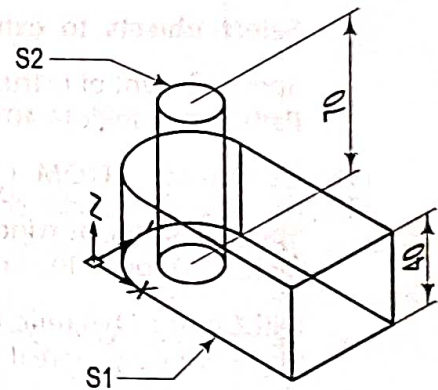


FIG. 26-57(v)

(9) Command: **EXTRUDE** (↵)
 Current wire frame density: ISOLINES=4
 Select objects to extrude: (Select Circle **CR1**)
 Select objects to extrude: (↵)
 Specify height of extrusion or [Direction/Path/Taper angle] <40.0000>: **70** (↵)

(10) Command: **ZOOM** (↵)
 Specify corner of window, enter a scale factor (nX or nXP), or
 [All/Center/Dynamic/Extents/Previous/Scale/Window]
 <real time>: **ALL** (↵)
 Regenerating model.

(11) Command: **SUBTRACT** (↵)
 Select solids, surfaces and regions to subtract from ..
 Select objects: (Select Solid 3D Box **S1**)
 Select objects: (↵)
 Select solids, surfaces and regions to subtract ..
 Select objects: (Select Solid 3D Cylinder **S2**)
 Select objects: (↵)

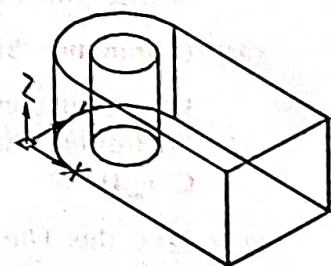


FIG. 26-57(vi)

(12) Command: **UCS** (↵)

Current ucs name: *WORLD*

Enter an option [New/Move/orthoGraphic/Prev/.../World]<World> : **G** (↵)

Enter an option [Top/Bottom/Front/BAck/Left/Right]<Top>: **RIGHT** (↵)

(13) Command: **UCS** (↵)

Current ucs name: *RIGHT*

Enter an option [New/Move/orthoGraphic/Prev/.../World] <World>: **M** (↵)

Specify new origin point or [Zdepth]<0,0,0>: (Select ENDPOINT magnet **E1**)

(14) Command: **CIRCLE** (↵)

Specify center point for circle or [3P/2P/Ttr (tan tan radius)]: **2P** (↵)

Specify first end point of circle's diameter: (Select MIDPOINT magnet **M2**)

Specify second end point of circle's diameter: (Select MIDPOINT magnet **M3**)

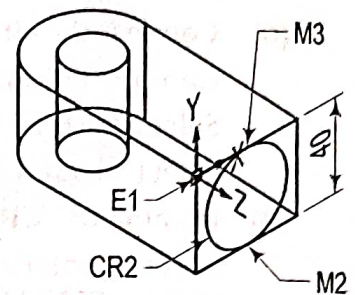


FIG. 26-57(vii)

(15) Command: **EXTRUDE** (↵)

Current wire frame density:

ISOLINES=4

Select objects to extrude: (Select Circle **CR2**)

Select objects to extrude: (↵)

Specify height of extrusion or [Direction/Path/Taper angle]<40.0000>: **150** (↵)

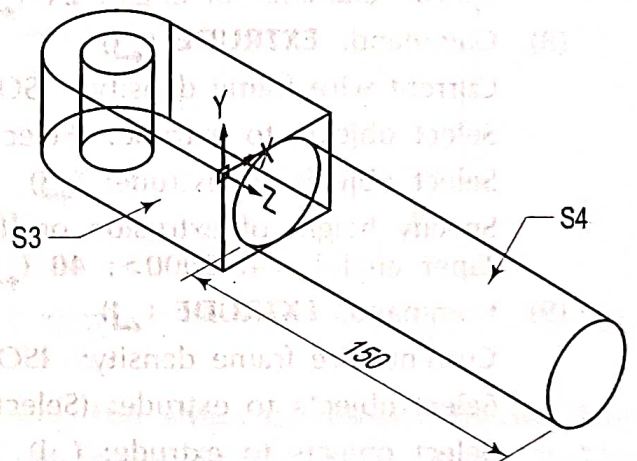


FIG. 26-57(viii)

(16) Command: **ZOOM** (↵)

Specify corner of window, enter a scale factor (nX or nXP), or

[All/Center/Dynamic/Extents/Previous/Scale/Window] <real time>: **ALL** (↵)

(17) Command: **UNION** (↵)

Select objects: (Select Solid **S3**)

Select objects: (Select Solid **S4**)

Select objects: (↵)

(18) Command: **SHADEMODE** (↵)

Enter an option [2dwireframe/3dwireframe/3dHidden/Realistic/...] <Conceptual>:

C (↵)

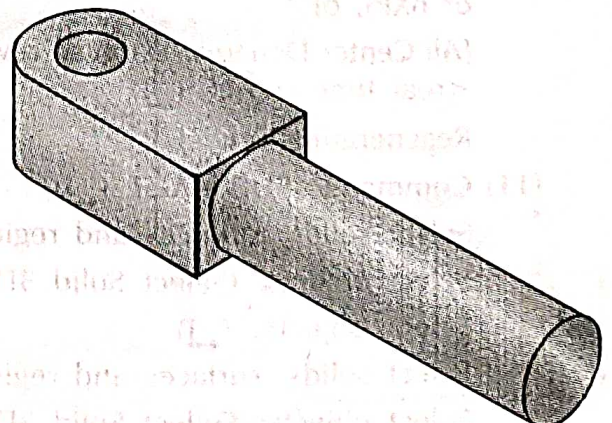


FIG. 26-57(ix)

(19) Save this File As **Module 26-45.DWG**

Output of Module 26-45 (fig. 26-57):

MODULE 26-45: USE OF 3D COMMANDS REGION, EXTRUDE, SUBTRACT AND UNION

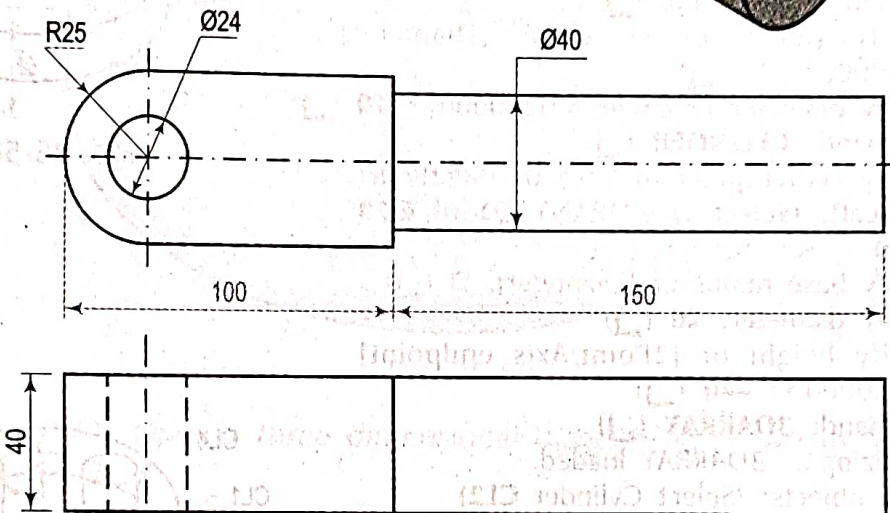
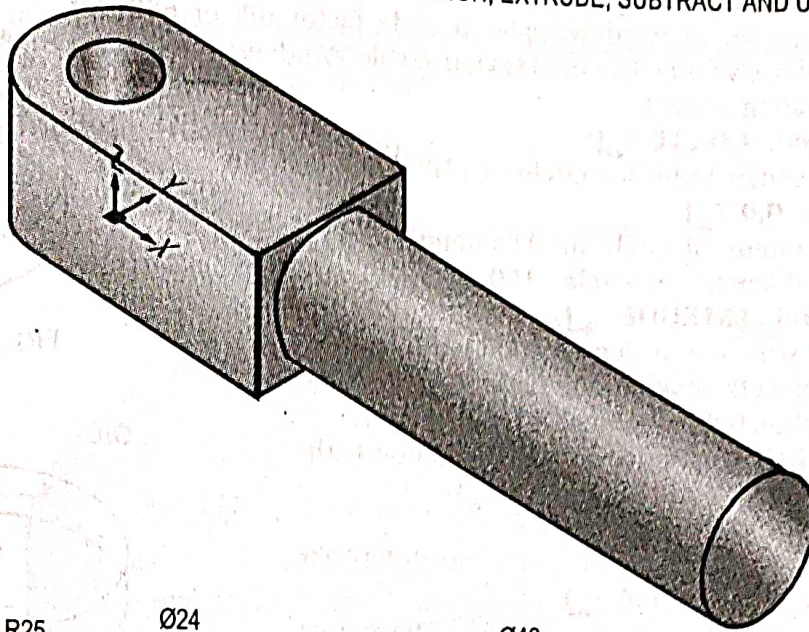


FIG. 26-57

Module 26-46. Draw a three dimensional diagram as shown in fig. 26-58. Use 3D Polar Array.

To draw a three dimensional diagram using the steps mentioned below. After executing the commands in sequence, we will get the output as shown in fig. 26-58(i) to fig. 26-58(vi).

- (1) Command: **LIMITS** (↵)
 Reset Model space limits:
 Specify lower left corner or [ON/OFF] <0.0000,0.0000>: (↵)
 Specify upper right corner <12.0000,9.0000>: **120,90** (↵)
- (2) Command: **ZOOM** (↵)
 Specify corner of window, enter a scale factor (nX or nXP), or [All/Center/Dynamic/Extents/Previous/Scale/Window] <real time>: **ALL** (↵)
- (3) Command: **VPOINT** (↵)
 Current view direction: VIEWDIR=0.0000,0.0000,1.0000
 Specify a view point or [Rotate] <display compass and tripod>: **1,-1,1** (↵)
 Regenerating model.

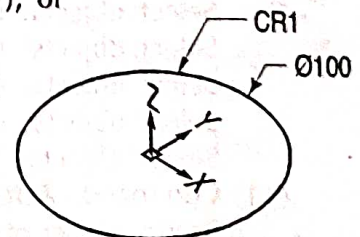


FIG. 26-58(i)