DEPARTMENT OF CIVIL ENGINEERING

LABORATORY MANUAL

FOR

CIVIL ENGINEERING DRAWING LAB-I,
3RD SEMESTER

C. V. RAMAN POLYTECHNIC

(Affiliated to SCTE & VT and Approved by Govt. Odisha)
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Vision:

Civil engineering department is committed to impart knowledge and excellence in civil Engineering to the students and to produce civil engineers of high calibre, technical skills and ethical values to meet current and future challenges.

Mission:

M1: To produce civil engineers with quality technical skills aligned with industry needs to solve real life problems of the society.

M2: To create teaching learning environment for students to acquire knowledge as per need and to motivate towards entrepreneurship and to pursue higher studies.

M3: To serve construction industries, civil engineering profession and the community at large through dissemination of knowledge and technical services to improve quality of life and enhance employability.

M4: To inculcate self-learning attitude and professionalism.

Program Educational Objectives (PEOs)

PEO1- To analyze in civil engineering profession or Higher education by acquiring thorough knowledge and concepts in fundamentals of engineering.

PEO2-To Apply knowledge and skills to real life problems and there by rendering safe and economical structures against natural calamities and also environmentally sustainable and useful to society.

PEO3- To understand entrepreneurial endeavors and to develop effective communication skill and passion for learning.

Program Specific outcomes (PSO)

PSO1- Able to meet the needs of public in the design and execution of quality construction work considering health, safety, cultural and environmental factors.

PSO2- Analyze and design regular and complex structures applying knowledge of building analysis software package.

PSO3- Able to work effectively as an individual or in a team having acquired leadership skills and manage projects in multidisciplinary environment.

CONTENT

Exercise1: Introduction to computer aided drafting (CAD)

Introduction

Computer Aided Drafting can be done by using the graphic commands available in High Leveling usages (HLL) like BASIC, FORTRAN, PASCAL, Cand C++.

CAD is an important industrial art extensively used in many applications, including automotive, ship building, and aerospace industries, industrial and architectural design, prosthetics,jewellery designing and many more. CAD is also widely used to produce computer animation for special effects in movies, advertising and technical manuals, often called Digital content creation (DCC)

Advantages of using CAD:

- Increases effiency of your drawings
- Timesaving
- Accurate, precise, & immediately alterable

Disadvantages of using CAD:

- Financially costs more per license
- Must and should have computer basic knowledge irrespective of concept

CAD is divided in many types

- 2D
- 3D
- Orthographic
- Isometric
- Perspective

Exercise2: Software for CAD –Introduction to different software‘s

AutoCAD is as of tare application for 2D and 3Dcomputer-aided design(CAD) and drafting available since1982 developed by Autodesk founded by ***John Walker.***

AutoCAD®

Logos of the AUTODESK & AutoCAD ®are trademark registered the diamond like A shape Icon shows latest logo of AutoCADforupcoming2014product

Official Name	Version	Release	Date of release	Comments
AutoCADVersion1.0	1.0	1	1982,December	DWGR1.0fileformatintroduced.
AutoCADVersion1.2	1.2	2	1983,April	DWGR1.2fileformatintroduced.
AutoCADVersion1.3	1.3	3	1983,August	DWGR1.3fileformat introduced.
AutoCADVersion1.4	1.4	4	1983,October	DWGR1.4fileformatintroduced.
AutoCADVersion2.0	2.0	5	1984,October	DWGR2.05fileformatintroduced.

AutoCADVersion2.1	2.1	6	1985,May	DWGR2.1fileformatintroduced.
AutoCADVersion2.5	2.5	7	1986,June	DWGR2.5fileformatintroduced.
AutoCADVersion2.6	2.6	8	1987,April	DWGR2.6fileformatintroduced.Lastversionto run without a math co-processor.
AutoCADRelease9	9.0	9	1987,September	DWGR9file format introduced.
AutoCADRelease 10	10.0	10	1988,October	DWGR10fileformatintroduced.
AutoCADRelease11	11.0	11	1990,October	DWGR11fileformatintroduced.
AutoCADRelease12	12.0	12	1992,June	DWGR11/R12fileformatintroduced.Lastrel easeforAppleMacintoshtil2010.
AutoCADRelease13	13.0	13	1994,November	DWGR13fileformatintroduced.Lastreleasefor Unix, MS-DOS and Windows3.11.
AutoCADRelease14	14.0	14	1997,February	DWGR14fileformatintroduced.
AutoCAD2000	15.0	15	1999,March	DWG2000fileformatintroduced.
AutoCAD2000i	15.1	16	2000,July	
AutoCAD2002	15.6	17	2001,June	
AutoCAD2004	16.0	18	2003,March	DWG2004fileformatintroduced.

AutoCAD2005	16.1	19	2004,March	
AutoCAD2006	16.2	20	2005,March	Dynamic Block introduced.
AutoCAD2007	17.0	21	2006,March	DWG2007fileformatintroduced.
AutoCAD2008	17.1	22	2007,March	Annotative Objects introduced. AutoCAD 2008 andhigher(includingAutoCADLT)candirectlyimportandunderlay*DGN*V8files.
AutoCAD2009	17.2	23	2008,March	Revisions to the user interface including the option of a Microsoft Office 2007-like tabbedribbon.
AutoCAD2010	18.0	24	2009,March24	DWG 2010 file format introduced. Parametricsintroduced.Mesh3Dsolid modeling introduced. Both 32-bit and 64-bit versions of AutoCAD2010 and AutoCAD LT 2010 are compatiblewithandsupportedunderMicrosoftWindows7.
AutoCAD2011	18.1	25	2010,March25	Surface Modeling, Surface Analysis and Object Transparency introduced. October15, 2010AutoCAD2011forMac was released. Are compatible with and supported under MicrosoftWindows7
AutoCAD2012	18.2	26	2011,March22	Associative Array, Model Documentation. Support for complex line types in DGN files is improved in AutoCAD2012.DGNediting.
AutoCAD2013	19.0	27	2012,March27	DWG2013fileformatintroduced.

AutoCAD2014	19.1	28	2013,March26	File Tabs, Design Feed, Reality Capture, Autodesk Live Maps

Table showing various versions of AutoCADsince1982

Top10freeopensourcesoftwareas alternatives for AutoCAD:

1. QCAD

This is an application that will allow you to draft two dimensions objects. It's a great tool for all types of technical drawings, works for Windows, Mac OS X and many Linux and Unix Systems, and of course, it is completely free.

2. Cero Elements

One of the more popular choices for 3D work. It is a very fast and flexible alternative to AutoCAD with many options included that AutoCAD is known for having.

3. Google Sketch Up

Just as Google seems to have an alternative for just about any paid program you can think of, it has an AutoCAD alternative as well. Sketch Up has been lauded as a very versatile and easy-to-use alternative for design students and professionals.

4. Free CAD

This is an Open Source 3D modeler that works great for mechanical engineering and product design. The program can help in various types of design and modeling programs and runs exactly the same way on Windows, Mac OSX and Linux platforms.

5. Draft Sight

Great software for students, professionals and teachers which can be used to create, edit and view all types of DWG files, which is the most common format for most CAD-related applications.

6. BRL-CAD

A cross-platform and open source solid modeling system that has a bunch of different features to offer, including interactive geometry editing, image and signal-processing tools and large libraries for making tons of different types of geometric representations.

7. gCAD3D

This free software offers many features, including an integrated 3D-OpenGL viewer, a programinterpreter for geometry and NC commands in 3D, an integrated NC processor and can be usedwithWindowsandLinux. Thewebsiteis alittlesparseandconfusing,butthefreewareisnot.

8. Archimedes

A 3D modeling application that allows you to create complex compound 3D shapes. It is toutedforbeingoneof themost functional freeAutoCADalternatives out there.

9. PythonCAD

One for the Linux users, this is a CAD package that was written in the Python programminglanguage, hence the name. One of the best open-source CAD packages for Linux, and it's alsoquite simple to use if you have any kind of prior experience with two and three dimensionalmodeling.

10. progeCAD

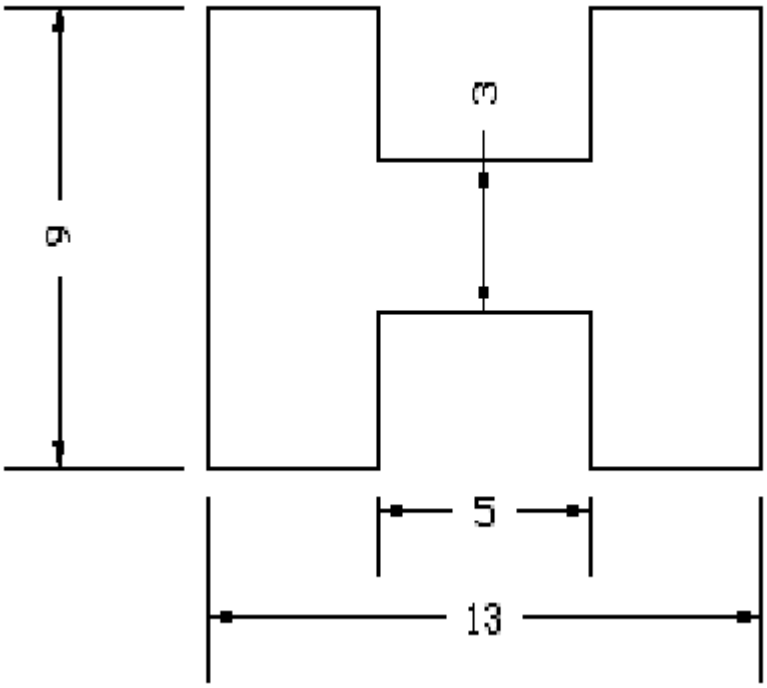
This one is free for private use but cannot be used commercially. It reads and writes pretty muchall AutoCAD files and has an interface that is very similar to AutoCAD's, which makes it highlyrecommendedamongpeople who haveexperiencewith AutoCADbeforehand.

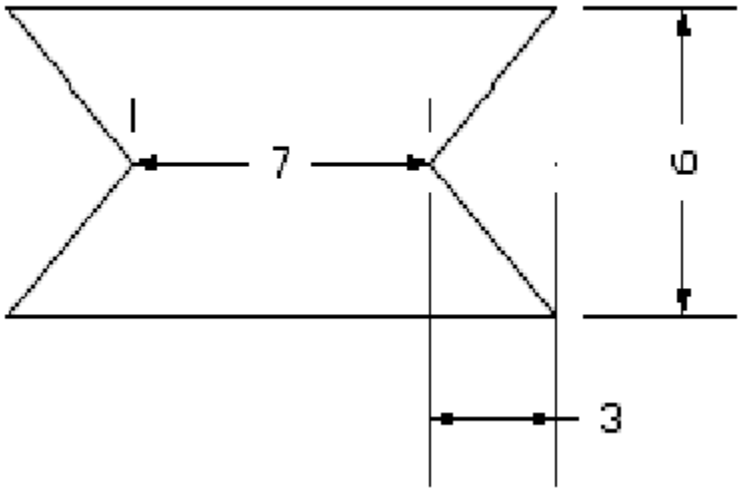
DWG (DraWinG) is a binary file format used for storing two and three dimensional design dataand metadata. It is the native format for several CADpackagesincludingDraftSight,AutoCAD,IntelliCAD(andits variants)

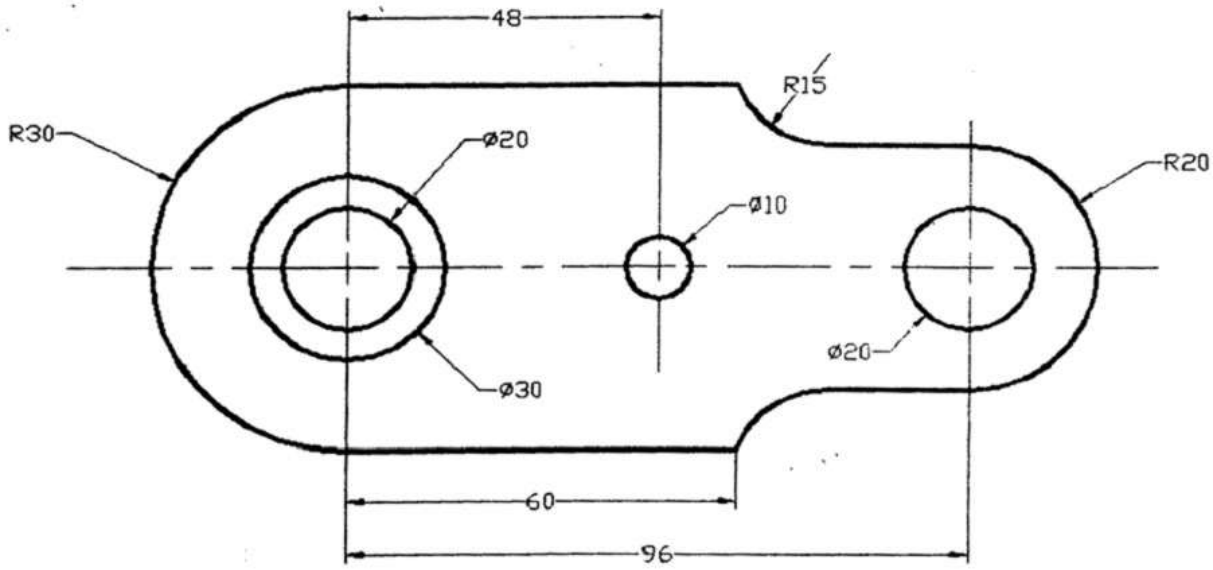
Weuse***commands***inuser interfaceof AutoCAD.

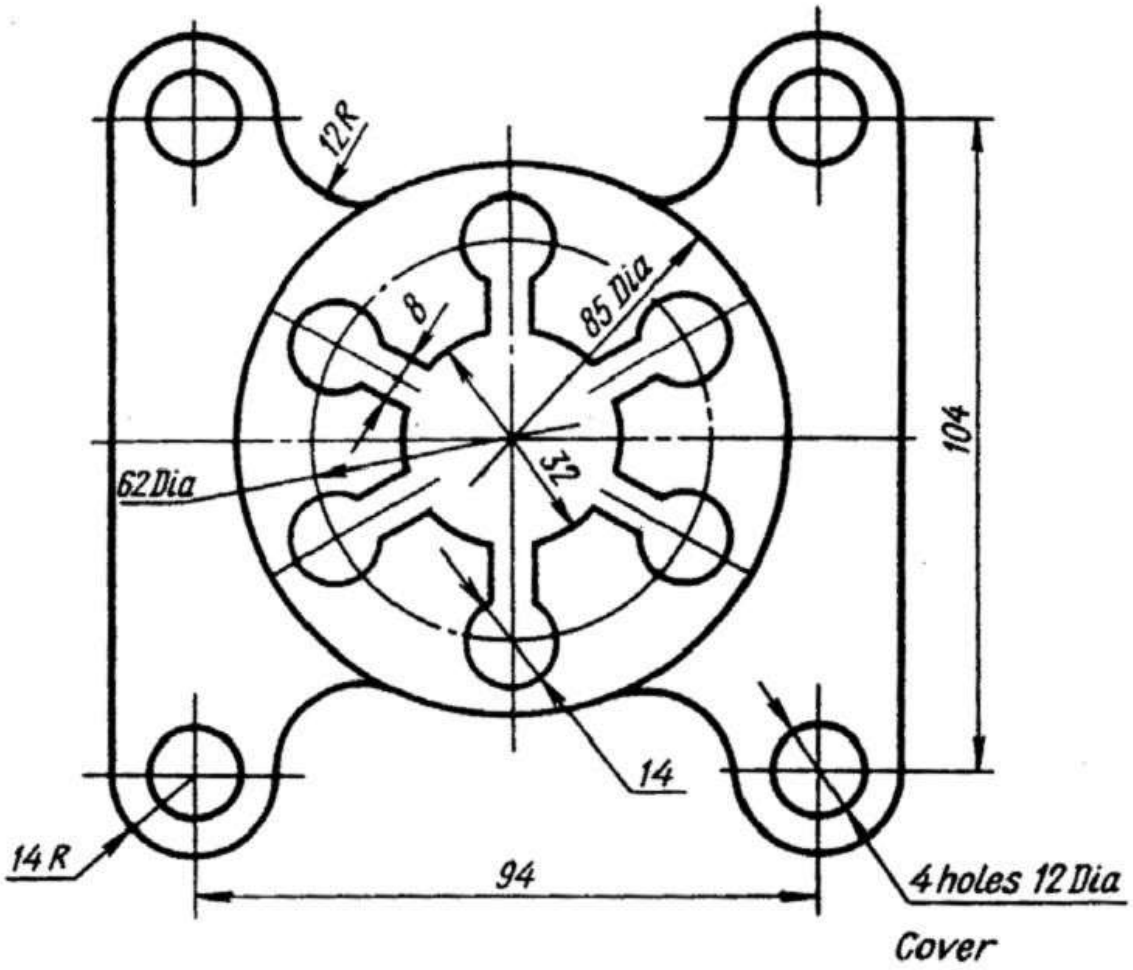
- Commandsarecase Insensitive
- Commandmeanswhichhadpredefinedfunction.

Exercise3:Practiceexerciseson CADsoftware

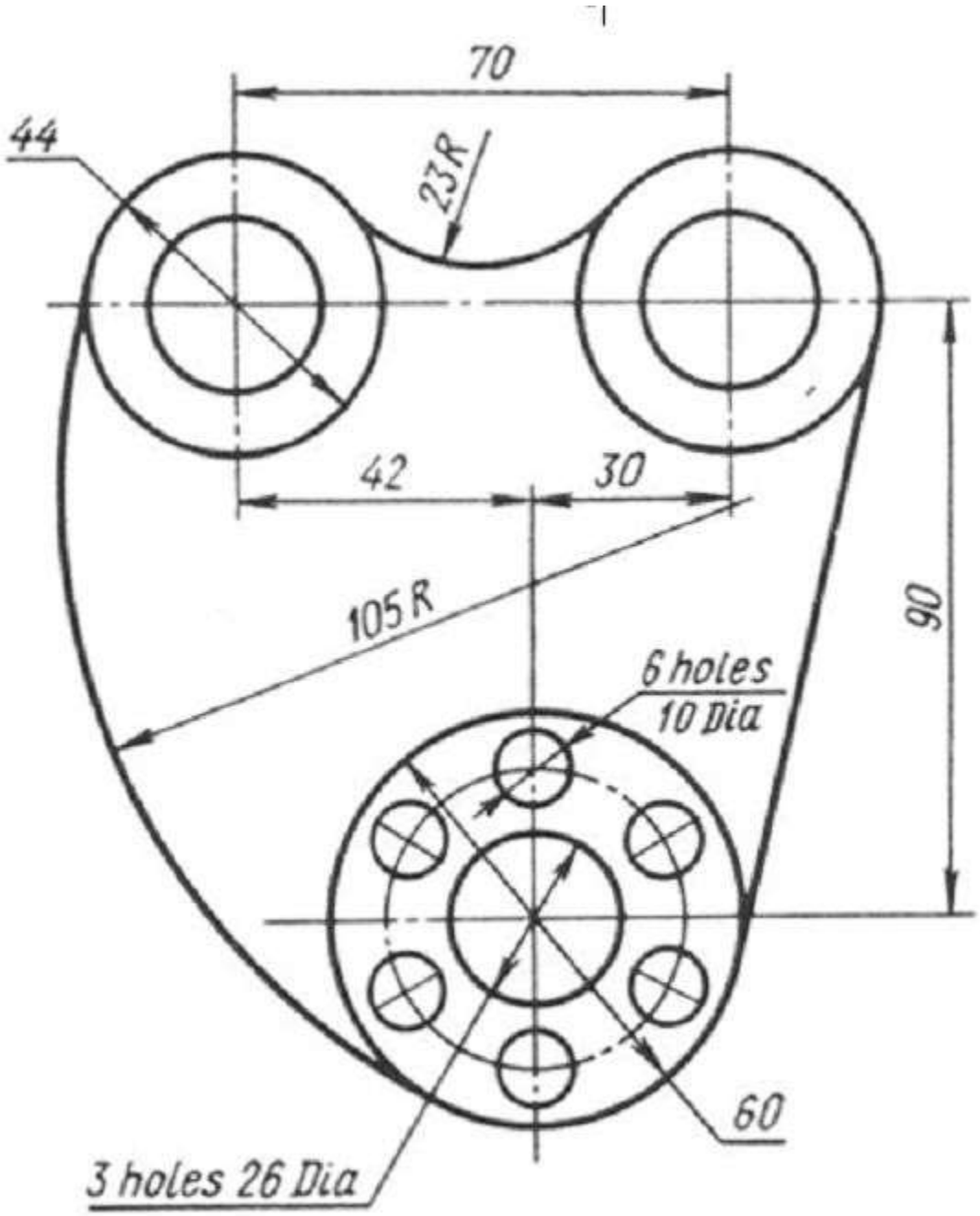


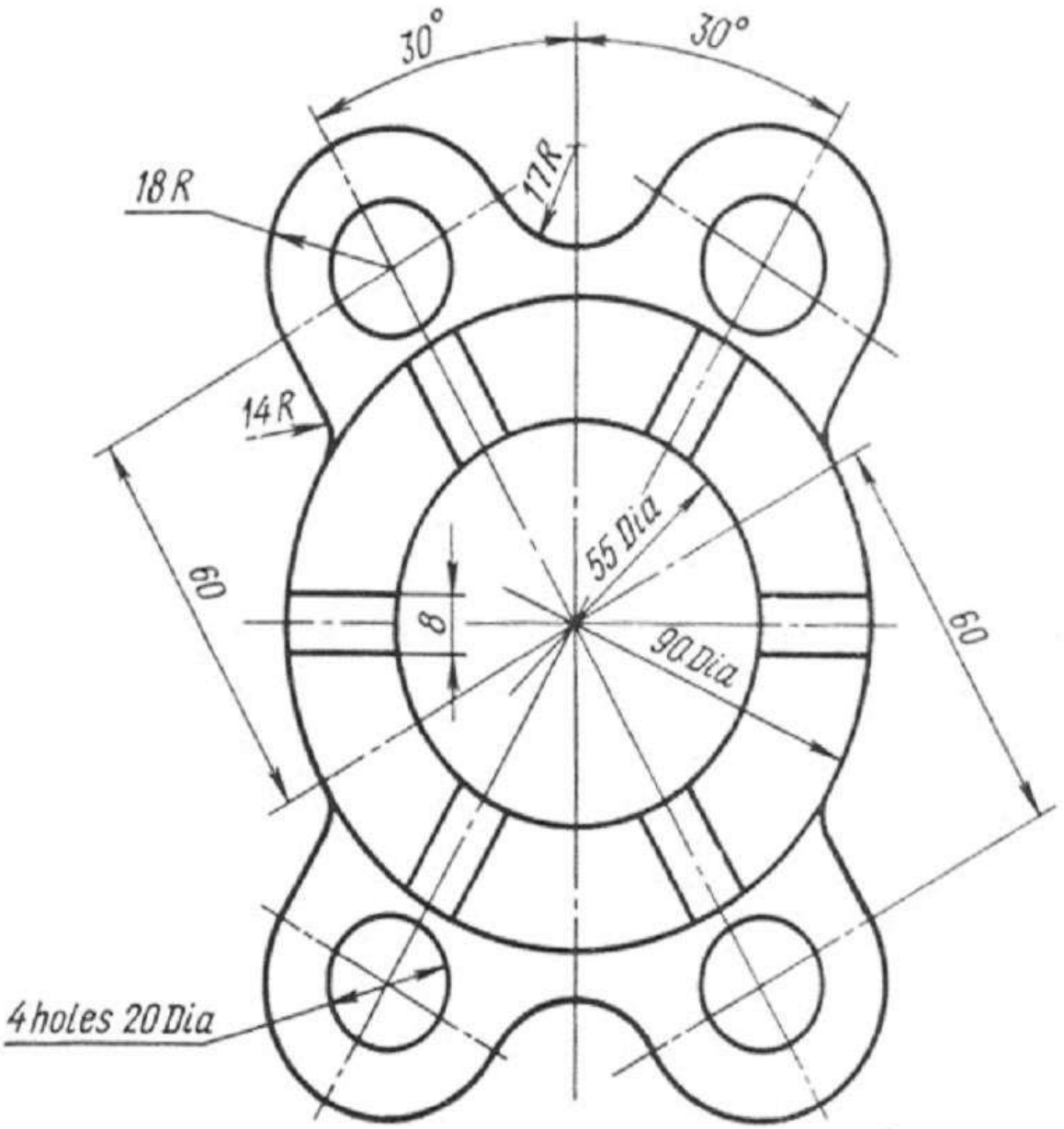



48
R15
R30
ø20
ø10
R20
ø20
ø30
60
96

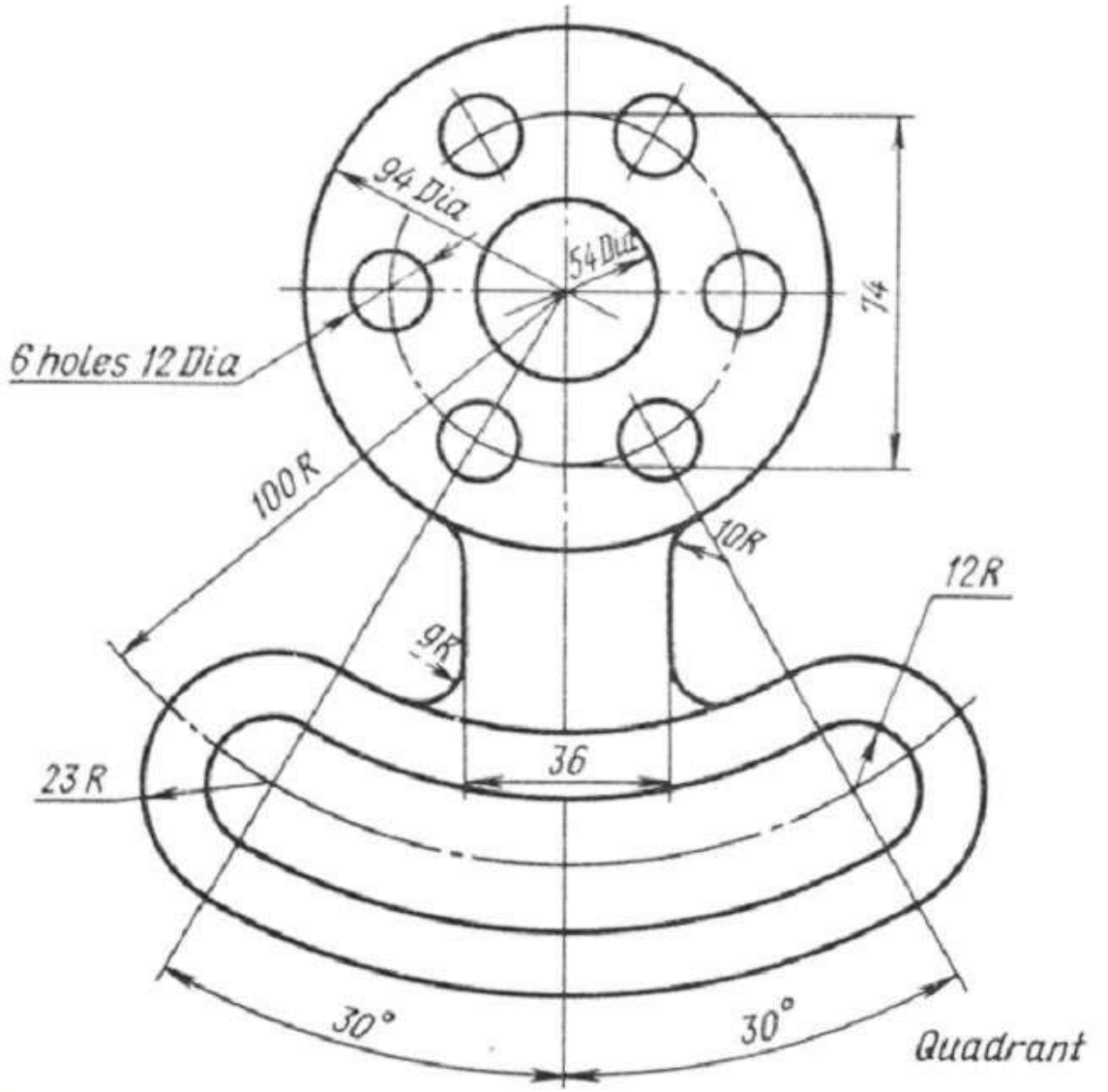

12R
8
85 Dia
62 Dia
32
104
14
14 R
94
4 holes 12 Dia

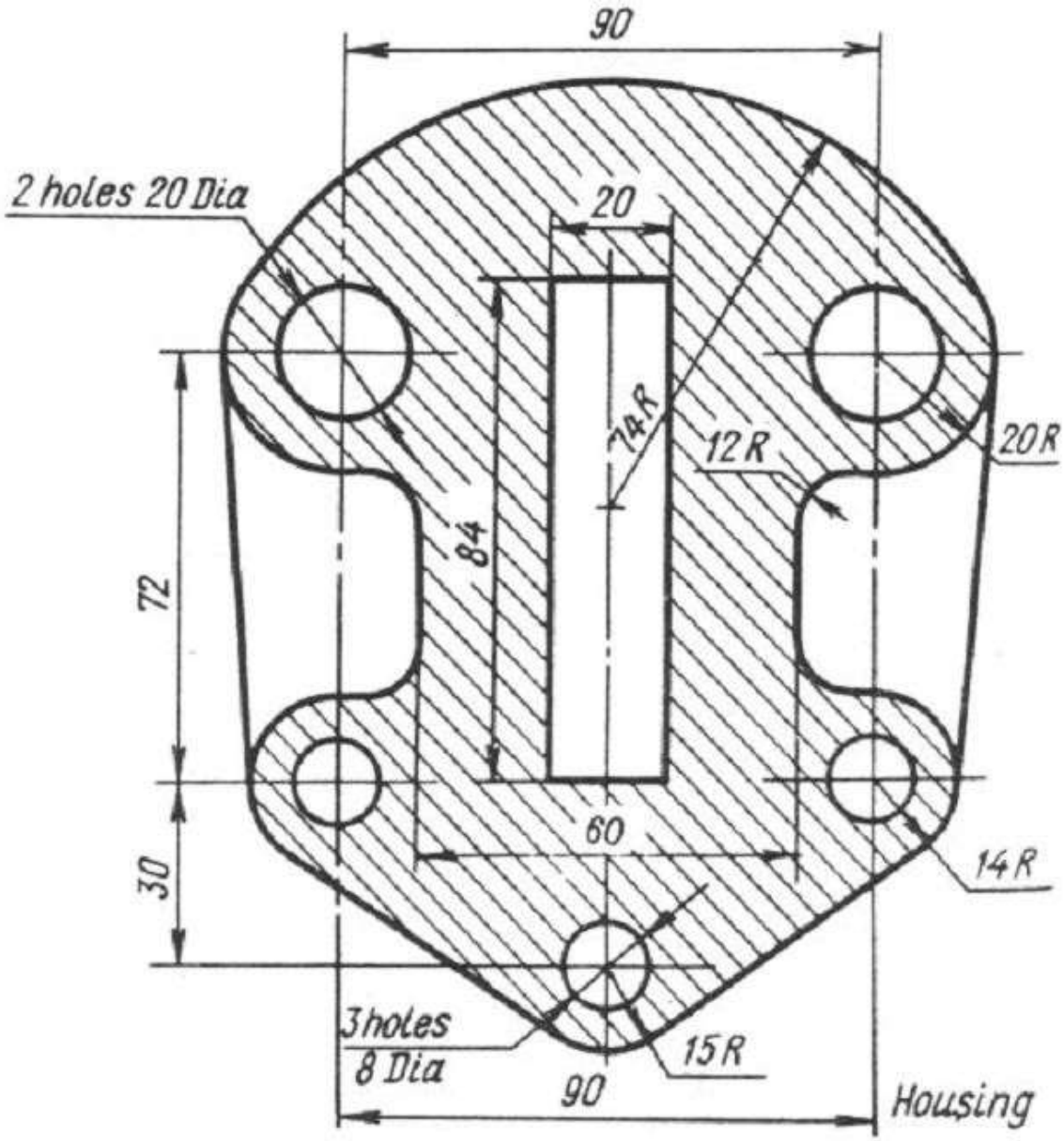
Cover

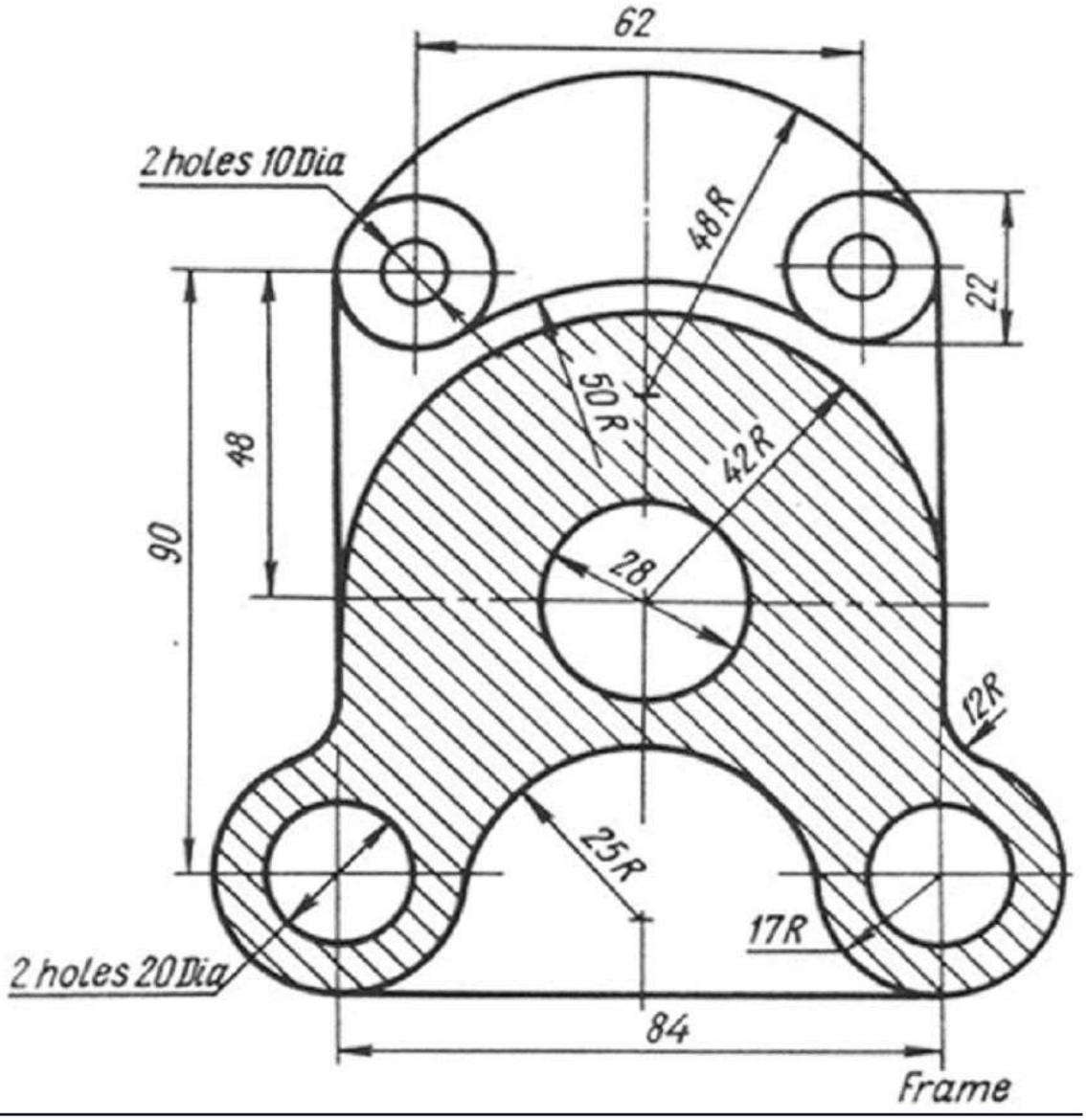

70
44
23R
42
30
105 R
90
6 holes
10 Dia
60
3 holes 26 Dia



Cover


94 Dia
54 Dia
74
6 holes 12 Dia
100 R
10R
12R
9R
36
23 R
30°
30°
Quadrant


90
2 holes 20 Dia
20
74R
12R
20R
84
72
60
30
14R
3 holes
8 Dia
15R
90
Housing


62
2 holes 10 Dia
48R
22
50R
42R
48
90
28
12R
25R
17R
2 holes 20 Dia
84
Frame

Command	*Description*	*Options*
ARC **or** **A**	**Draws an arc. The defaultmethod of drawing arcs isselecting three points (so-called"3pointarc"),whicharethetwoendpoints of the arc and someother point along its locus. Othermethods of drawing an arc canbe specified by three letters, suchas SEA, which means "StartPoint, End Point, and IncludedAngle."**	**AIncluded angle** **CCenterpointof arc** **D Direction angle of a line tangenttothearc** **EEndpointofarc** **L Length of chord passing thrubothendpoints ofthe arc** **RRadius** **SStartpoint ofarc** **<RET>usestheendofthelastlineorarcasthe start point forthe arc**
BREAK	**Erases part of a line, arc orcircle, or splits it into two linesorarcs**	**F allows respecification of firstpoint**
CHAMFER	**Creates a chamfer (a angled lineconnection) at the intersection oftwolines**	**DSetschamferdistances** **PChamfersan entirepolyline**
CIRCLE **or** **C**	**Draws a circle of any size. Thedefault method is to pick acenterpointandpickapointonthe radius or type the radiusdimension, but other methodscanbeselected.**	**2PSpecifiescirclebypicking2points thediameter** **3P Specifies circle by picking 3points through which the circle willpass** **D Allows entering the diameterdimension instead of radiusdimension** **TTR Specifies circle by picking twolines,arcsorcirclesforthecircleto be tangent to, and entering thedimension ofthe radius** **<RET>Entersradiusofcircle(thedefault)**

COPY or CP	**Drawsacopyofselectedobjectsusing two methods -- "basepoint" method, or"displacement"method.**	**M Allows multiple copies to bemadeofan object**
ELLIPSE	**Drawsellipses**	**CAllowsspecificationofCenterpoint of ellipse rather than firstaxisendpoint R Allows specification ofeccentricityrotationratherthan lengthofsecond axis IDrawsIsometriccircleincurrentisoplane**
EXTEND	**Lengthens a line, arc, or polylineto meet a specified "boundaryedge"**	**UUndoeseffectoflastExtendcommand**
EXPLODE	**Separates a block, dimension orhatch pattern into its constituententitiesormakesapolylineintoa series of straight lines. In thecase ofablockthatisexploded,if it was originally drawn on the0 layer, it returns to that layer,regardless of the layer it wasinserted on, and it loses itsreferential connection to theoriginal block. In the case of adimension or hatch pattern thathasbeenexploded,theirpartsgoback to the 0 layer, and areassigned the logical color(BYBLOCK) regardless of thelayer they were drawn on. In thecase of an exploded polyline, itlosesanywidthitmayhavehad.**	
ERASE or E	**Erasesselectedentitiesfromthedrawing**	

FILLET	**Constructs an arc of specifiedradius between two lines, arcs,circles, or will create arcs of thespecifiedradiusattheverticesofa polyline. Radius of the arc tobe constructed may be set to 0,whichwillmakeasharpcorner**	**P Fillets an entire Polyline at thevertices R Allows setting of the fillet radius.Default value is 0. Radius remainssetuntil changed again**
HATCH	**Allows drawing of cross-hatchingandpatternfilling**	**<pattern-name>useshatchpatternname from library file to filldesignated area with a pseudo-blockhatchentity--canbereduced to individual lines andpointsby EXPLODEing it. <*pattern-name>useshatchpattern name from library file tofilldesignatedareawithindividuall inesandpoints, not a block U "User-defined" hatch patterndrawn of parallel lines with aspecified distance between, at aspecified angle, and either single-hatchingordouble(cross)-hatching ?Listsnamesofavailablehatchpa tterns <pattern-name> or U can befollowed by a comma and thefollowingsub-commands: IIgnoresanyboundariesinsidetheou termostboundary N Normal style of selectingboundaries with alternatinghatchedandunhatc hednestedareas O Hatches outermost boundaryareaonly**
LIMITS	**Changes the imaginaryboundaries of the drawing, andcontrolswhetherdrawingcanbemade outside of the boundaries.IfLimit-checkingisON,drawing cannot be done outsideof limits.**	**canbetransparent <2 points> Sets lower-left andupper -right drawing limitsON Enables limit-checkingOFFDisableslimit-checking**

LINE or L	**Drawsstraightlines**	**<RET>InreplytoFromPoint:pr ompt, line begins at end ofpreviouslineorarc CInreplytoTopoint:prompt,clos es the polygon back to first"FromPoint" UInreplytoTopoint:prompt,un doeslast linesegment**
MEASURE	**Places points (or, optionally,Blocks) at intervals along aselected line, polyline, arc orcircle. The interval distance isgiven by the user. If points areused as the marker to be placedalong the entity, they are notvisibleunlessthePointtypeisset to type 3 with the PDMODEcommand.**	**B specifies that a defined Block isto be used as a marker instead of apoint.**
MIRROR	**Reflectsdesignatedentitiesa boutauser-specifiedaxis**	
MOVE or M	**Movesdesignatedentitiestoa notherlocation**	
OFFSET	**Creates a new line, polyline arcor circle parallel to the entityandataspecifieddistancefr omit.**	**<number> specifies offset distanceT"Through"allowsspecific ationof a point through which the offsetline,polyline,arcorcircleistopa ss**
OSNAP	**Enables points to be preciselylocated on reference points ofexisting objects. This is the so-called "Running Mode" ofOSNAP, which sets selectionmethod to run continuously untilset to NON (none) or untiloverridden by selecting another"Interrupt Mode"**	**canbetransparent CEN CENter of arc or circleENDclosestENDpointofar corline INS INSertion point of Text orBlock INTINTersectionofline,arc,orcir cle MID MIDpoint of line, arc,rectangle side, or polygon sideNEA NEArest point selected byapertureonline,polyline,arc,or**

	a series of options separated bycommas. For instance, if youwant ot always pick eitherendpoints or intersection pointswhen locating endpoints of lines,youwouldissuethecommand asfollows: **OSNAP<RET> END,INT <RET>**	**circle** **NODNODe(anothernameforaPoint)** **NON NONe -- used when a"Running OSNAP" is on totemporarilyturnoffOSNAP selection** **PER PERpendicular point to line,arc or circle -- when used with anarc or circle it will draw a line tothe surface of the arc or circleheading toward the center pointQUA QUAdrant point of arc orcircle (top, bottom, right or leftside)** **QUI QUIck mode -- this is amodifier to one of the otherOSNAP options -- it will find thefirst point that meets therequirements,notnecessarilythe closestpoint tothe aperture.** **TANTANgentpointtoarcorcircle**
PEDIT	**Allows editing of polylines whicharealready drawn**	**CClosesanopenpolyline** **D Decurves, or returns a Splinecurvetoitscontrolframeorseriesof connected straightlines** **EEditvertices** **F Fits curve to a polyline -- makes aseries of straight lines into a curvewhichwillpassthroughtheverticesJ Joins a line or arc or anotherpolylineto an openpolyline** **LTogglesslinetypegenerationtobeeither a continuous pattern ofdashespassingthroughthevertices, or a pattern which startsandends at eachvertex** **OOpensaclosedpolyline** **S Uses the polyline vertices as aframe for a Spline Curve -- type ofSpline Curve is set by the Variable"Splinetype."**

		U-Undoes one editing operationW Sets a uniform width for thePolyline
PLINE	**Draws a 2D polyline, which areconnected line or arc segmentswith user-determined width andtaper**	**H sets the half-width of the polylinesegments U Undoes previous segmentW sets the width of polylinesegments <RET> Exits the Pline commandThefollowingoptionsarea vailableonly as long as you are drawing inLinemode: A Switches to the Arc mode toallow integration of arcs into thepolyline C Closes the polyline with straightsegment LSegmentlength(continuesp revioussegment) Thefollowingoptionsareavailableon ly as long as you are in the Arcmode: A Included angleCECenterP oint CLCloseswitharcsegmentD Starting direction L Chord length, or switches to linemode RRadius SSecondpointof3-pointarc**
PLOT	**Plots a drawing to a plottingdevice,aprinter,ortoa" PlotFile."**	
POINT	**Drawssinglepoints.Appearanceof the points is set by theVariablePDMODE**	
POLYGON	**Draws regular polygons with aspecifiednumberofsides. Polygonsare Polylineentities.**	**E Specifies size and rotation ofpolygon by picking endpoints ofoneedge CCircumscribespolygon arounda**

		circle IInscribespolygonwithin acircle
PURGE	Removes unused Blocks, TextStyles, Layers, Linetypes, andDimensionStylesfromcurrentdrawing	APurgesAllunusednamedobjectsBPurges unusedBlocks D Purges unused DimstylesLAPurgesunusedLAyersLT Purges unused LinetypesSH Purges unused Shape filesSTPurgesunusedTextStyles
QSAVE	Saves the current drawing"Quickly"withoutrequestingafilename (as long as file hasalreadybeen givena name)	
QTEXT	Controlsdisplayoftext--command stands for"QuickTEXT"	ONLinesoftextdisplayedasrectangles OFFLinesof textdisplayedastext
QUIT	Exits AutoCAD -- if the currentdrawing has not been Saveds inits current state, a dialogue boxwillappearaskingifyouwanttoSave the drawing, Discard thechanges, or Cancel the Exitcommand	
REGEN	RegeneratesthecurrentViewport by recalculating thevectorlocationsofallendpoints	
ROTATE	Rotatesexistingobjectsparallelto thecurrent UCS	
SAVE	Requestsafilenameandsavesthedrawing	
SAVEAS	SameasSAVE,butalsorenamesthecurrent drawing and keepsthenewnamecurrent	

STRETCH	**Allowsmoving a portion ofadrawing while retaining theirconnectionstootherpartso fthedrawing. You cannot stretchBlocks, Hatch patterns, or Textentities,however.**	
TEXT	**Draws text characters of any sizewithselected styles**	J Prompts for justification optionsSListsorselects textstyle AAlignstextbetweentwopoints,withstyle-specified width factor, AutoCAD computesapproximate height proportional to length oftext line CCenterstexthorizontallyaboutadefinedp oint FFitstextbetweentwopoints,withspecifiedhe ight, AutoCAD computes approximatewidth factor to fill the distance between thetwo points M Centers text horizontally and verticallyabouta defined point RRight-justifiestext BL Bottom Left justificationBC Bottom Center justificationBR Bottom Right justificationML Middle Left justificationMCMiddleCente rjustificationMR Middle Right justificationTLTopLeft justification TCTopCenterjustificatio nTRTopRightjustificatio n
TRIM	**Erases a portion of selectedentitiesthatcrossas pecified"cuttingedge"**	UUndoeslast trimoperation
Uorundo	**Reversestheeffectofthe previouscommand**	
UCS	**Definesormodifiesthecurrent UserCoordinateSystem**	D("Delete")Deletesoneormoresavedc oordinatesystems E ("Entity") Sets a UCS with the sameextrusiondirectionasthatoftheselected entity

		O("Origin")Shiftstheoriginofthecurrentcoordinatesystem P ("Previous") Restores the Previous UCSR ("Restore") Restores a previously savedUCS S("Save")SavesthecurrentUCS V("View")EstablishesanewUCSwhoseZ-axis is parallel to the current viewingdirection W ("World") Sets the current UCS to theWorldCoordinate System XRotatesthecurrentUCSaroundtheX-axisYRotatesthecurrentUCSaroundtheY-axisZ Rotates the current UCS around the Z-axisZA Defines a UCS using an origin point andapointonthepositiveportionoftheZ-axis3 Defines a UCS using an origin point, apoint on the positive portion of the X-axis,and a point on the positive Y-portion of theXYplane ?Listsspecifiedsavedcoordinatesystems
UCSICON	**Controls visibility andplacement of the UserCoordinate System Icon, whichgraphically indicates the originand orientation of the currentUCS. The options normallyaffectonlythecurrentviewport.**	A Changes settings of all active viewportsN("NoOrigin")DisplaystheUCSICONat thelower-leftcorneroftheviewport(i.e.,notattheOrigin) OR("ORigin")Displays theUCSICONattheorigin of the current UCS, if possible (if theoriginpointisnotwithinthecurrentviewport, the location of the UCSICONdefaults to the lower-left corner of theviewport) OFFTurnstheUCSICONoffO NTurns theUCSICONon
UNDO	**Reverses the effect of multiplecommands,andprovides controloverthe "Undo" facility**	<number>Undoesthe<number>ofmostrecentcommands inreverseorder A ("Auto") Controls treatment of menu itemsasUNDO"Groups" B("Back")UndoesbacktopreviousUNDO"Mark" C("Control")Enables/disablestheUNDOfeature E("End")Terminates an UNDOGroup (a

		sequence to be treated as one command)G ("Group") Begins an UNDO Group (asequencetobetreatedasonecommand) M ("Mark") Places "marker" in UNDO file(forusewith"Back") ControlSub-Options AllEnablesthefullUNDOfeature NoneDisablesUandUNDOentirely,anddiscards any previous UNDO informationsavedearlier in theeditingsession One Limits U and UNDO to a singleoperation
UNITS	**Selects coordinate and angledisplayformatsandprecision**	canbetransparent
ZOOM	**Enlarges or reduces the displaymagnification of the drawing,without changing the actual sizeof the entities**	canbetransparent <number>multiplierfromoriginalmagnification <numberX>multiplierfromcurrentmagnification <number XP>multiplier of magnificationrelativetopaperspace--usedforplottingtogetright plotscalein eachviewport A("All") fillslimitsofdrawingtoscreen C("Center")makespickedpointthecenterofthescreen D("Dynamic") makesanadjustiblerectangularlensappearonthescreenwhichiscapable of being made smaller or larger andmoved to different positions over the drawingand once set by the user, the drawing willquickly zoom to the location andmagnification set for the lens. This sub-command is no longer useful because allcomputers have very fast zooms naturallynow. E("Extents")makesthefarthestedgesoftheactual visible drawing fill up the graphicsscreen L ("Lower-Left") makes the point pickedbecomeshovedtothelower-leftcornerofthegraphicsscreen P("Previous")zoomsbacktowhateverthe

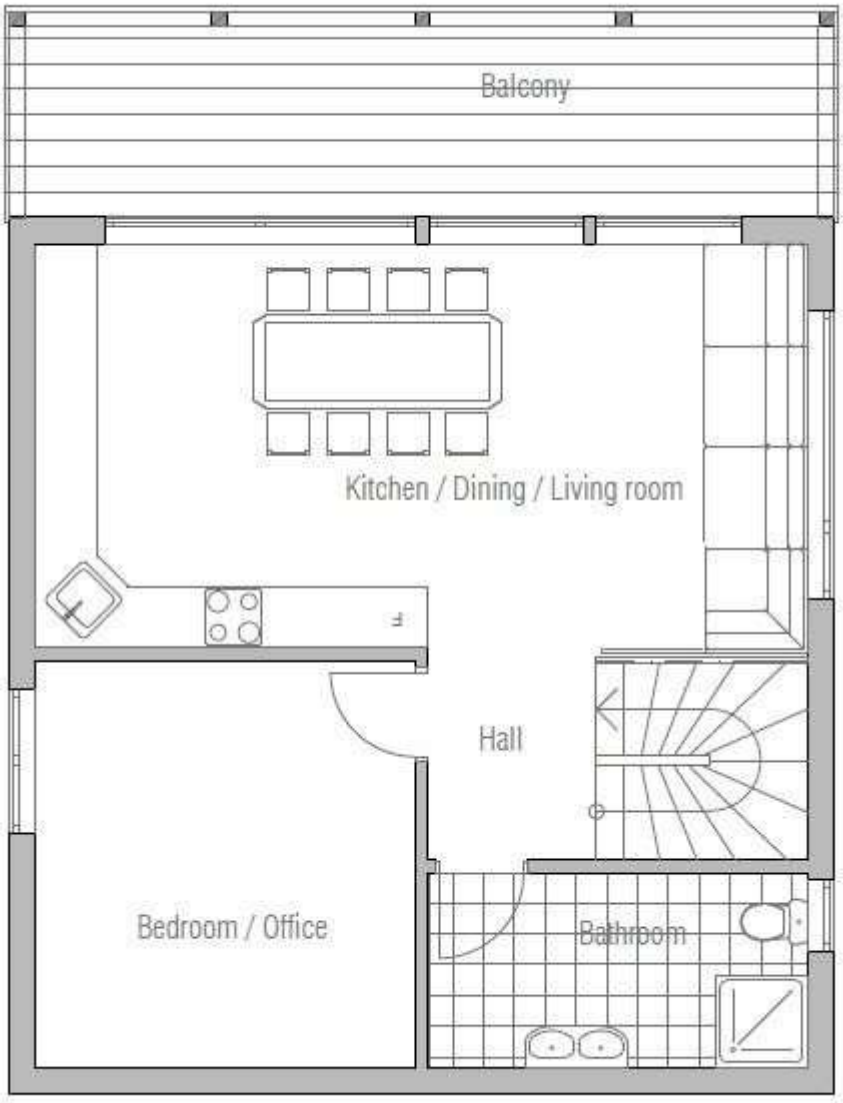
		lastzoom,previous tothecurrent zoomwas- - AutoCAD stores about 10 of these, so youcanwalkbackwardinzoommagnification10 times V ("Virtual Screen") makes the largest areaavailabletothegraphicscardfillthegraphics screen -- this varies with the quantity ofgraphicsRAMthatyour graphicscardhas W("Window")asksyoutopickthelowerleftcorner and the upper right corner of a zoomwindowand then fitsthatwindow to thegraphicsscreen
3DPOLY	**Createsa3Dpolyline**	C Closes the polyline back to the first pointUUndoes(deletes)thelastsegmententered <RET>Exits 3DPOLYcommand

EXERCISE4:Drawingofplansofbuildingsusingsoftware

a)Singlestoreyedbuildingsb)multistoryedbuildings

Building plan: a drawing that showsthe shape,size, and arrangement of rooms in a buildingfromabove

Theabovepicturea3D isometric viewof abuildingplan



Theabovepictureshows2dPlan drawn in AutoCAD

PLAN@GROUND
FLOOR
PARKING
ENTRANCE
8'
60'
45'
10'-11"
21'-4"
5'-4"
WATCHMAN
ROOM
10'X12'
TOILET
4'6"X3'6"
OFFICE
ROOM
10'X12'
ENTATRAINMENT
CENTER
LIVING
HALL CUM
DINING
27'X12'6"
BED ROOM
10'6"X12'6"
TOILET
4'6"X3'6"
LOBBY
KITCHEN
10'6"X8'6"
BED ROOM
10'6"X12'6"
TOILET
7'X3'6"
BACK
COURT 8'
WIDTH

PLAN@FIRST FLOOR
TERRACE
BACK COURT 8' WIDTH
PRIVATE ROOM 11'X9'
TOILET 6'6"X4'
BED ROOM 11'X14'11"
STORE ROOM 11'X9'
TERRACE 6'X11'
6'
45'-7"
10'-11"
2'-8"
2'-8"
27'-3"
3'
60'
45'

Exercise6:DetailingofbuildingcomponentslikeDoors,Windows,RoofTrussesetc.usingCADsoftware

Types of Doors:

• Battened and ledge door

• Battened and braced door

• Battened and framed door

• Battened, ledge, and framed door

• Framed and paneled door

• Glazed door

• Flush door

• Louvered door

• Wire gauged door

• Revolving door

• Sliding door

• Swing door

• Collapsible steel door

• Rolling shutter door

• Mild steel sheet door

• Hollow metal door

• PVC door

Types of Windows:

• Fixed

• Pivoted

• Double hung

• Sliding

• Casement

- Sash
- Louvered
- Metal
- Bay
- Corner window
- Dormer window
- Gable window
- Lantern