LIST OF EXPERIMENTS

AUTO CAD LAB

S No	Experiment Name
1	**Introduction to Auto CAD**
2	**Different Softwares for CAD**
3	**Practice Exercises on Auto CAD Software**
4	**Drawing Plan of a building in Auto CAD** a) **Plan of a Single Storeyed building in Auto CAD** b) **Plan of a Multi Storeyed building in Auto CAD**
5	**Drawing Section and Elevation of a building in Auto CAD** a) **Section and Elevation of a Single Storeyed building in Auto CAD** b) **Section and Elevation of a Multi Storeyed building in Auto CAD**
6	**Detailing of building components like Doors, Windows, Roof Trusses**
7	**Exercises on development of working drawings of buildings in Auto CAD**

Introduction to Auto CAD

Aim: - To study about special features, advantages and applications of Auto CAD in detail.

Requirements: -

- Auto CAD Software
- Intel Pentium IV, or compatible
- Microsoft Windows XP (Professional, Home Edition, or Tablet PC Edition), Windows 2000 Professional SP4
- 512 MB RAM (minimum)
- 750 MB free disk space
- 1024x768 VGA with true color (minimum)
- Mouse or other pointing device
- CD-ROM drive
- Microsoft Internet Explorer 6 SP1

Theory: -

CAD means Computer Aided Design or Drafting. Auto cad is most widely used software developed by auto desk. Auto cad is a drafting package in almost all engineering branches. There are drafting packages like cad are DIAP, CAMD, and Delights. Auto cad is one of the most popular cad packages. It is a general purpose computer aided design. We can draw geometrical entries like plan, section and elevation of a building.

Advantages: -
- We can make accurate and precise drawings like plan, section and elevation of a building.
- Improved engineering productively.
- Reduced engineering personal requirement.
- Drawing modification or eraser to intake.
- Drawings prepared in the software can be stored safely.

Applications of CAD: -

- Preparation of Architectural drawings in the Auto CAD
- Preparation of maps of an area
- Preparation of Building drawings
- Preparation of circuit layouts for water distribution and sewer systems

Result: -

Studying of Auto CAD, its applications and its advantages is done.

Different Softwares for CAD

Aim: - To study different softwares for Auto CAD.

Requirements: -

- Auto CAD Software
- Intel Pentium IV, or compatible
- Microsoft Windows XP (Professional, Home Edition, or Tablet PC Edition), Windows 2000 Professional SP4
- 512 MB RAM (minimum)
- 750 MB free disk space
- 1024x768 VGA with true color (minimum)
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Theory: -

CAD means Computer Aided Design or Drafting. Auto cad is most widely used software developed by auto desk. Auto cad is a drafting package in almost all engineering branches. There are drafting packages like cad are DIAP, CAMD, and Delights. Auto cad is one of the most popular cad packages. It is a general purpose computer aided design. We can draw geometrical entries like plan, section and elevation of a building.

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Applications of CAD: -

- Preparation of Architectural drawings in the Auto CAD
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- Preparation of circuit layouts for water distribution and sewer systems

Result: -

Studying of Auto CAD, its softwares and its advantages is done.

Practice Exercises on Auto CAD Software

Aim: - To study and practice basic draw commands exist in the Auto CAD.

Requirements: -

- Auto CAD Software
- Computer Hardware

Commands: -

- Line
- Poly line
- Construction line
- Polygon
- Rectangle
- Arc
- Circle
- Ellipse

Theory: -

Line: The LINE command is used to draw a line between two specified points. First enter the LINE command or shortcut L in the command area. Mouse Cross hair displays to specify the first point of the line and next point of the line or enter the distance of the line. Press ESC key at the end of the line.

Polyline: POLYLINE command is used to draw a series of lines continuously at a time. PL or PLINE is the keyboard shortcut for polyline.

Rectangle: RECTANGLE command is used to draw a rectangular geometry in the drawings. REC is the keyboard shortcut for rectangle. First enter the REC command in the command area. A cross hair will be displays to specify the first corner point of the rectangle and input the dimensions of the rectangle as other corner point.

Circle: Circles are created with the CIRCLE command. There are several different ways you can define a circle. Those are defining center point and radius or diameter of the circle. In the 2Point method Define the circle with points on either end of the circle diameter. In the 3Point method Define the circle with 3 non-collinear points. In the Tangent, Tangent and Radius method define the circle by specifying two other objects that are tangent to the circle and the radius of the circle.

Arc: ARC command is used draw partial circles in the Auto CAD drawings. There are seven methods available to draw an arc in the Auto CAD.
Those are

  i.   Specifying 3 points on the arc
 ii.   Specifying starting point, center and end point
iii.   Specifying starting point, center and included angle
 iv.   Specifying starting point, center and length of the cord
  v.   Specifying starting point, end point and radius
 vi.   Specifying starting point, end point and included angle and
vii.   Specifying starting point, end point and direction of start

Polygon: The POLYGONE command is used to draw a polygon with 3 to 1024 sides by specifying a circle inscribed or circumscribed with definite radius or by entering side length of the polygon.

Ellipse: This ELLIPSE command is used to draw ellipses by giving starting and ending angles

Result: Studying and practicing of all basic draw commands is done in the Auto CAD.

Experiment No: 4

Drawing Plan of a building in Auto CAD

A) **Plan of a Single Storeyed building in Auto CAD**

Aim: To draw Plan of a Single Storeyed building in Auto CAD

Requirements: -

- Auto CAD Software
- Computer Hardware

Commands: -

- Rectangle
- Line
- Copy
- Move
- Hatch
- Text
- Dim linear
- Trim
- Offset

Procedure:

Set the units and drawing limits for the drawing in the format option as required

Plan procedure:

- Draw the rooms using RECTANGLE command with 3.5mX8m, 1.3mX0.9m, 2mX1.2m, 3.5mX7.1m and 3.5mx2.5m dimensions to represent bed room, toilets, bathroom, drawing room, and kitchen respectively
- Arrange all rooms in required position using MOVE command with reference to the given line diagram
- Draw the wall thickness rectangle using OFFSET command with0.23m width

- Draw the rectangles for windows with 1.1mX1.25mat mentioned position and for door with 1.0mX2.0m and 0.75mX2m dimensions and place them in required position using MOVE command
- Open at door positions using TRIM command and draw type of the door
- Draw the sunshades of 0.6m projection with a bearing of 0.15m all-around the windows
- Draw two steps in front of the door with raise 150mm and tread 300mm using RECTANGLE command

Result: Drawing Plan of a Single Storeyed building is done in the Auto CAD

B) Plan of a Multi Storeyed building in Auto CAD

Aim: To draw Plan of a Multi Storeyed building in Auto CAD

Requirements: -

        Auto CAD Software

        Computer Hardware

Commands: -

- Rectangle
- Line
- Copy
- Move
- Hatch
- Text
- Dim linear
- Trim
- Offset

Procedure:

Set the units and drawing limits for the drawing in the format option as required

Plan procedure:

- Draw the rooms using RECTANGLE command with 3.5mX8m, 1.3mX0.9m, 2mX1.2m, 3.5mX7.1m and 3.5mx2.5m dimensions to represent bed room, toilets, bathroom, drawing room, and kitchen respectively
- Arrange all rooms in required position using MOVE command with reference to the given line diagram
- Draw the wall thickness rectangle using OFFSET command with0.23m width
- Draw the rectangles for windows with 1.1mX1.25mat mentioned position and for door with 1.0mX2.0m and 0.75mX2m dimensions and place them in required position using MOVE command

- Open at door positions using TRIM command and draw type of the door
- Draw the sunshades of 0.6m projection with a bearing of 0.15m all-around the windows
- Draw two steps in front of the door with raise 150mm and tread 300mm using RECTANGLE command
- Do the same for all floors on the ground floor of the building to represent different floor plans

Result: Drawing Plan of a Multi Storeyed building is done in the Auto CAD

Experiment No: 5

Drawing Section and Elevation of a building in Auto CAD

A) **Section and Elevation of a Single Storeyed building in Auto CAD**

Aim: To draw Section and Elevation of a Single Storeyed building in Auto CAD

Requirements: -

- Auto CAD Software
- Computer Hardware

Commands: -

- Rectangle
- Line
- Copy
- Move
- Hatch
- Text
- Dim linear
- Trim
- Offset

Procedure:

Set the units and drawing limits for the drawing in the format option as required

Section Procedure:

- Draw rectangles of dimensions 0.9mX0.3m, 0.6mX0.6m, 0.4mX0.6m and 0.25mX3m using RECTANGLE command to represent C.C bed, footing, basement and height of building respectively
- Arrange all of them in required position using MOVE command
- Draw a rectangle with depth of 120mm to represent slab of the building
- Draw the parapet(0.45m Height and 150mm thick), sunshades, doors, windows and lintels(150mm thick and 15mm bearings) in the section using LINE or RECTANGLE command

- Draw the Shahabad tile flooring over C.C of 100mm thick using LINE command
- Hatch the section using HATCH command in required portions of the drawing

By projecting lines from plan and section draw the elevation of the building with paneled door and window with steps in front of door

Result: Drawing Section and Elevation of a Single Storeyed building is done in the Auto CAD

B) Section and Elevation of a Multi Storeyed building in Auto CAD

Aim: To draw Section and Elevation of a Multi Storeyed building in Auto CAD

Requirements: -

Auto CAD Software

Computer Hardware

Commands: -

- Rectangle
- Line
- Copy
- Move
- Hatch
- Text
- Dim linear
- Trim
- Offset

Procedure:

Set the units and drawing limits for the drawing in the format option as required

Section Procedure:

- Draw rectangles of dimensions 0.9mX0.3m, 0.6mX0.6m, 0.4mX0.6m and 0.25mX3m using RECTANGLE command to represent C.C bed, footing, basement and height of building respectively
- Arrange all of them in required position using MOVE command
- Draw a rectangle with depth of 120mm to represent slab of the building
- Draw the parapet(0.45m Height and 150mm thick), sunshades, doors, windows and lintels(150mm thick and 15mm bearings) in the section using LINE or RECTANGLE command
- Draw the Shahabad tile flooring over C.C of 100mm thick using LINE command

- Hatch the section using HATCH command in required portions of the drawing

By projecting lines from plan and section draw the elevation of the building with paneled door and window with steps in front of door

Result: Drawing Section and Elevation of a Multi Storeyed building is done in the Auto CAD

Detailing of building components like Doors, Windows, Roof Trusses

Aim: To draw components like doors, windows and roof trusses of a building in Auto CAD

Requirements: -

1. Auto CAD Software
2. Computer Hardware

Commands: -

- Rectangle
- Line
- Copy
- Move
- Hatch
- Text
- Dim linear
- Trim
- Offset

Procedure:

Set the units and drawing limits for the drawing in the format option as required

- Draw a rectangle using RECTAGLE command with dimensions equal to door dimensions

Command Sequence:

Command: RECTANGLE↵

Specify first corner point:

Specify the second corner point:

- Using OFFSET command draw a parallel rectangle inside the above drawn rectangle

Command Sequence:

Command: OFFSET↵

Specify the offset distance:

Select the object to offset:

- Draw the wooden panels with required dimensions using RECTANGLE and OFFSET command
- Move all those panels into exact position by using MOVE command and hatch to show wooden portion and glazed potion using HATCH command.

Command Sequence:

Command: HATCH↵

Select the pattern: Glass

Add pick points:↵

- Do the same for drawing windows and roof trusses

Result: Drawing Components like Doors, Windows and roof Trusses of a building is done in the Auto CAD

Experiment No: 7

Exercises on development of working drawings of buildings in Auto CAD

Aim: To prepare Drawings for a building in the Auto CAD

Requirements: -

- Auto CAD Software
- Computer Hardware

Commands: -

- Rectangle
- Line
- Arc
- Copy
- Move
- Hatch
- Text or M TEXT
- Dim linear
- Trim
- Offset

Procedure:

Set the units and drawing limits for the drawing in the format option as required

- Draw the plan of the building with all rooms in the correct position using commands like LINE, RECTANGLE, OFFSET and MOVE with reference to the given line diagram
- Draw the section of the building with components like C.C bed, footings, basement and walls with sections and elevations of doors and windows with specified dimensions and in exact position using MOVE command
- Hatch the required components of the section using HATCH command
- Draw the Elevation of the building by projecting lines from the plan and section

- Draw the site plan of the building with required spaces all around the building with details like car parking, plinth area, passages and location of the septic tank using RECTANGLE and LINE commands
- Draw the Key plan of the building which should show the position of the building among the surrounding structures and road network
- Draw the Title block at the left bottom corner of the drawing using LINE and OFFSET commands to write signature of the owner and surveyor
- Draw a tabular form above the title block and draw the details like Foundation details, Doors schedule and window schedule using LINE and M TEXT commands
- Draw the North Arrow above the table using required commands to show the direction and orientationof the drawings
- Using TEXT command write the details like room sizes, their name like bedroom or kitchen and sizes of steps

Water supply Layout:

- Draw the plan of the building with all rooms in the correct position using commands like LINE, RECTANGLE, OFFSET and MOVE with reference to the given line diagram
- Draw two parallel lines in front of the building plan with a distance of 3.75m between them to represent the road using LINE and OFFSET commands
- Draw the details like Tap, Shower, Storage tank, tubs, Water basins and sinks in the rooms of the plan using necessary commands
- Draw a line between two road lines using LINE command to represent main water pipe
- Draw a perpendicular line from the above drawn line up to points like taps and sinks to represent service or distribution pipes of the building
- Draw the circles at every intersection of the lines using CIRCLE command to represent valves between the pipes
- Using TEXT command write all the details

Sanitary Lines:

- Draw the plan of the building with all rooms in the correct position using commands like LINE, RECTANGLE, OFFSET and MOVE with reference to the given line diagram
- Draw two parallel lines in front of the building plan with a distance of 3.75m between them to represent the road using LINE and OFFSET commands

- Draw the details like Tap, Shower, Water closets, vent pipes, Water basins, septic tank, flushing cisterns and sinks in the rooms of the plan using necessary commands
- Draw a line between two road lines using LINE command to represent main sewer pipe
- Draw a perpendicular line from the above drawn line up to points like Water closets, Septic tanks and sinks to represent waste collecting pipes of the building
- Using TEXT command write all the details

Result: Preparation of Working Drawings of a building in the Auto CAD is done