

### **Q. Explain the role of computers in building planning and designing.**

**A.** Today, the process of building planning and designing has largely been automated and accelerated through the use of computer-aided drawing systems (CAD). It helps in the creation, modification, analysis, or optimization of a building design. Computers are used to increase the productivity of the designer, improve the quality of design, improve communications through documentation and to create a database for building construction.

There are two types of computer-aided building design systems used for the planning and designing of buildings: two dimensions ("2D") and three dimensions ("3D").

2D CAD systems such as AutoCAD or MicroStation replace the paper drawing discipline. The lines, circles, arcs and curves are created within the software. It is down to the technical drawing skill of the user to produce the drawing. There is still much scope for error in the drawing when producing first and third angle orthographic projections, auxiliary projections and cross sections. A 2D CAD system is merely an electronic drawing board. Its greatest strength over direct to paper drawing is in the making of revisions. Whereas in a conventional hand drawn building drawing, if a mistake is found, or a modification is required, a new drawing must be made from scratch. The 2D CAD system allows a copy of the original to be modified, saving considerable time. 2D CAD systems can be used to create plans for large projects such as building complexes and airports, but provide no way to check whether the various components will fit together.

3D CAD systems such as AutoDesk Inventor or SolidWorks first produce the geometry of the parts, the technical drawing comes from user defined views of the parts. Any orthographic, projected and section views are created by the software. There is no scope for error in the production of these views. The main scope for error comes in setting the parameter of first or third angle projection, and displaying the relevant symbol on the building drawing. 3D CAD allows individual parts to be assembled together to represent the final product. Buildings are modelled, assembled and checked in 3D before technical drawings are released for construction.

BS and ISO produce standards to show recommended practices but it is up to individuals to produce the drawings. There is no definitive standard for layout or style. The only standard cross engineering workshop drawings is in the creation of the orthographic projections and cross section views.

Drafting can represent two dimensions ("2D") and three dimensions ("3D") although the representation itself is always created in 2D. Drafting is the integral communication of technical or engineering drawings and is the industrial arts sub-discipline that underlies all involved technical endeavours.

In representing complex, three-dimensional objects in two-dimensional drawings, many details become hidden thereby not giving the engineer a complete view of the building. This obstacle may be overcome by 3D CAD drawings where a designed building may be rotated in all 3 dimensions and also individual parts may be zoomed in to get better idea of all the details.