

Question no.1: Multiple Choice Questions (MCQs)

1. To reverse the UNDO command the correct entry is?
 - a. **REDO**
 - b. REDRAW
 - c. ESC
 - d. U
2. The command to scale a paper space viewport to half the drawn size is?
 - a. **Zoom 0.5px**
 - b. Zoom 1/2x
 - c. Zoom 2xp
 - d. Zoom 0.5xp
3. Which of the following statements is true for AutoCAD?
 - a. **Zoom all will reach beyond the drawing limits if an object is there.**
 - b. Zoom all only reaches out to the drawing limits.
 - c. There is not real difference between zoom all and zoom E.
 - d. Zoom all makes all objects visible irrespective of the layer visibility state.
4. Which one of the following commands forces AutoCAD to revise the entire drawing taking into account the effect of changes within the system?
 - a. CHANGE
 - b. REDO
 - c. **REDRAW**
 - d. REGEN
5. Which one of the following options of the UNDO command allows the undo facility to be disabled?
 - a. AUTO
 - b. CONTROL
 - c. END
 - d. **GROUP**
6. Which one of the following commands allows simultaneous pan and zoom?
 - a. Zoom dynamic
 - b. **Zoom extents**
 - c. Zoom center
 - d. Zoom pan
7. Which one of the following commands cannot be undone?
 - a. XREF
 - b. **SETVAR**
 - c. SAVE

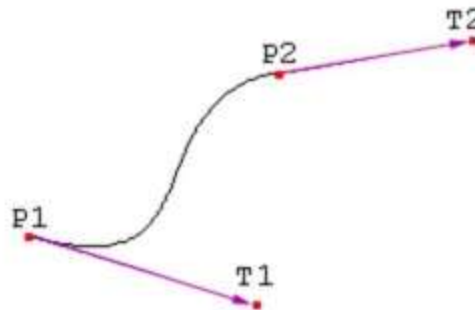
- d. LIST
- 8. The MAXIMUM number of commands whose effect can be undone by the UNDO command is?
 - a. 256
 - b. 1000
 - c. All the command issued since the drawing was first created
 - d. All commands issued since the drawing was last loaded into the drawing editor
- 9. Which one of the following commands would be used to limit the movement of the cursor to specified increments?
 - a. AXIS
 - b. GRID
 - c. ORTHO
 - d. SNAP
- 10. Which one of the following commands can be used to turn the grid through 45 degrees?
 - a. AXIS
 - b. GRID
 - c. ROTATE
 - d. UCS

Question no.2:

a. **Define Hermite curve.**

A hermite curve is a spline where every piece is a third degree polynomial defined in hermite form: by its value and initial derivatives at the end points of the equivalent domain interval.

Cubic polynomial splines used in computer geometric modelling to attain curves that pass via defined points of the plane in 3D space.



The following vectors needs to compute a Hermite curve:

1. P1: the start point of the Hermite curve
2. T1: the tangent to the start point
3. P2: the endpoint of the Hermite curve
4. T2: the tangent to the endpoint

b. Explain APT language?

APT: AUTOMATICALLY PROGRAMMED TOOLING

1. APT is a three-dimensional NC programming system.
2. APT is not only a language; it is also the computer program that processes the APT statements to calculate the corresponding cutter positions and generate the machine tool control commands.
3. **Four basic types of statements in the APT language:**
 - a. Geometry statements.
 - b. Motion commands.
 - c. Postprocessor statements.
 - d. Auxiliary statements.

c. Write down advantages of group technology?

1. Time saving
2. Good quality
3. Low cost
4. Good productivity
5. Automation

Question no.3:

a. What is kinematic analysis?

Kinematic analysis is the process of measuring the kinematic quantities used to describe motion. In engineering, kinematic analysis may be used to find the range of movement for a given mechanism and working in reverse, using kinematic synthesis to design a mechanism for a desired range of motion.

b. What are the functions of post – processor in FEM module?

The post processor is the section of the program that converts the XYZ coordinates for the tool moves into a format that is suitable for a particular router or machine tool.

c. State the advantages of FMS (Flexible manufacturing system)

1. Large variety of same products
Flexible manufacturing system FMS can produce a large variety of the same type (homogeneous) of products.
2. Profitable investment
The company invests a lot of money in machines. However, FMS makes optimum use of these machines. Therefore, though costly, FMS is still a profitable investment.
3. Requires limited inventory
FMS requires limited inventories compared to other production systems.
4. Low labour cost

In FMS, most of the work is done by automated machines and robots. There is hardly any need of a manual work or some human intervention. Therefore, in FMS, the labour cost becomes very low.

5. Flexible system

FMS is a very flexible system. This is because it can produce a large variety of similar products. The quantity and design of production can also be changed very quickly.

6. Speedy production

The products can be produced very quickly because the material are loaded, unloaded and transferred from one machine to another by robots.

Question no.4:

a. What is computer-aided process planning?

1. CAPP is a linkage between the CAD and CAM module.
2. Process planning is concerned with determining the sequence of individual manufacturing operations needed to produce a given part or product.
3. The resulting operation sequence is documented on a form typically referred to as a "Route sheet".
4. Process planning in manufacturing also refers to the planning of use of blanks, spare parts, packaging material, user instructions (manuals) etc.

b. Write euler-poincare formula used in solid modelling.

Euler operators allow for atomic modification of a B-rep model in a manner that keeps the following equation (known as euler-poincare formula) satisfied:

$$v - e + f = 2(s - h) + r$$

Here v is the number of vertices, e is the number of edges, f is the number of faces, s is the number of shells, h is the genus of manifold, and r is the number of internal loops.

Two kinds of Euler operators:

1. Make group: MEV, MEF, etc.
2. Kill group: KEV, KEF, etc.

c. Define FMS?

A flexible manufacturing system (FMS) is a manufacturing system in which there is some amount of flexibility that allows the system to react in case of changes, whether predicted or unpredicted.

Question no.5

a. What is the role of mesh generation in FEM (finite element method)?

It includes the use of mesh generation techniques for dividing a complex problem into small elements, as well as the use of software coded with a FEM algorithm.

b. Define "Flexibility" in flexible manufacturing system.

Flexibility is the ability to change a production schedule, to change a part, or to handle multiple parts.

c. When do you use a rotation transformation matrix?

When we have to rotate an object just parallel (or along) a specific axis so that the coordinate about which the object rotates, remains unchanged and the rest two of the coordinates get changes. There are three kinds of such rotations that are possible:

1. Rotation about the X-axis,
2. Rotation about the Y-axis,
3. Rotation about the Z-axis,