QUESTION BANK

UNIT – I Part A

1. Define CAD.
2. Define Automated drafting.
3. Define model coordinate system.
4. What is a geometric model? Mention its types.
5. Write the various design tasks performed by CAD system.
6. What is the graphic configuration of a graphic system?
7. What are functions of a graphic package?
8. List the types of output devices used in conjunction with computer Aided design system.
9. What are the modules of ICG?
10. Write the display devices used in computer graphics application.
11. Define Recognition of need.
12. Write the analysis step of design process.
13. Define CAD. Mention areas of application of CAD.
14. What is meant by concurrent engineering?
15. What are the advantages of Concurrent engineering?
16. What are the benefits of CAD?
17. What are the characteristics of concurrent engineering?
18. Name any 3 reasons for implementing CAD in design?
19. Define computer graphics.
20. What are the functions of IGC?
21. What are the various display control facilities in graphics?
22. What is the need of homogeneous coordinates?
23. What is viewing transformation and windowing transformation?
24. What is meant by Clipping?
25. State the use of reflection transformation.
26. What are the main types of 2D transformations?
27. Write a note on engineering design?
28. Define wireframe model.
29. Define Rotation

Part-B

1. Elaborate on the basic requirements that CAD software has to satisfy.
2. Distinguish between modes of the design process and models of designs.
3. Describe the various database models which are generally used.
4. What are the differences between the sequential approach to the product development
process and the concurrent engineering approach? Why should the latter be adopted?

5. A scaling factor of 2 is applied in the Y direction while no scaling is applied in the X
direction to the line whose two end points are at coordinates (1, 3) and (3, 6). The line is to be
rotated subsequently through 300, in the counter clockwise direction. Determine the necessary
transformation matrix for the operation and the new coordinates of the end points.
6. What are the reasons for implementing a computer aided design system.
7. The vertices of a triangle are situated at points (15, 30), (25, 35) and (5, 45). Find the
coordinates of the vertices if the triangle is first rotated 100' counter clockwise direction about
the origin and then scaled to twice its size.
8.. Describe the basic types of coordinate transformation in CAD, and then show how these
may all be calculated using matrix operations through the homogeneous coordinate with an
example of matrix .How the general rotation transformation be expressed in terms of a
combination of other transformation.
9. What is meant by Interactive Computer Graphics? Explain its various elements.
10. Briefly explain the Clipping and Line drawing with an example.
11. Compare and Contrast Sequential and Concurrent Engineering with suitable examples.
12. Explain with block diagram, the CAD process with suitable examples..
13. A rectangle with co-ordinate A(2,3), B(2, 5), C(6, 5) and D(6, 3) is reflected along line whose equation
is y = 2x + 4, and sheared by 2 units in x direction and 2 units in y direction. Find the new co-ordinates of
the object.
14. A triangle has coordinates with A(5, 2), B(3, 5), and C(7, 5).
First rotate the triangles by about the origin and then translate the triangle 2 units in x direction and 2 units
in y direction. • Then translate the triangle 2 units in x direction and 2 units in y direction and then rotate
by about the origin.Obtain the resultant for both cases and write your inferences.

UNIT – II

Part A

1. Define geometric modelling?
2. Classify geometric modelling.
3. Define sculptured surface.
4. What is meant by lofted surface?

5. List the common entities of a typical surface modeler?
6. Name the two basic approaches followed in solid modeling.
7. Give any two characteristics of Bezier curves.
8. Distinguish between Bezier curves and Cubic Spline curve.
9. Define B-Spline curve?
10. What is a spline?
11. What are the different ways of specifying spline curve?
12. Define surface model.
13. Define solid model.
14. Define rational curve.
15. What are the various representation schemes used in three dimensional objects?
16. What is surface patch?
17. Write short notes on rendering bi-cubic surface patches of constant u and v method?
18. What are the important properties of Bezier Curve?
19. Describe the 'Surface patch'.
20. List out properties of B-Spline.
21. Write down two important solid modeling techniques.

Part B

1.Write a note on:
1.NURBS
2. B-splines.
2. Discuss the modelling guidelines to be followed by the user while constructing a surface model as a CAD/CAM system.
3. Differentiate between Bezier and B- spline surface with reference to number of control points, order of continuity and surface normal.
4. Explain how a Bezier curve is defined.
5. What are the advantages of Bezier curves over cubic spline?
6. Explain how the curves are represented in Generic form
7. Explain how the curves are represented in parametric form.
8. Describe the effect of characteristic polyhedron over the resulting Bezier surface.
9. What do you mean by blending function? Explain rep of a surface.
10. Briefly explain CSG and B–Rep of solid modelling techniques.
11. Explain the different schemes used to generate a solid model
12.Write short notes on approximated synthetic curves.
13. Derive the equation for Bezier Curve. Find the equation of a Bezier curve which is defined by the
four points as P0 (2, 2, 0), P1(2, 3, 0), P2(3, 3, 0) and also find the points on the curve for u = 0, ¼, ½,
¾, 1.

14Find the equation of the Bezier surface with four corner points as shown in figure and also find midpoint of surface.

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15. Derive the equation for Hermite Cubic spline curve.

16. Draw a Bezier spline for the following control points: (0, 0), (4, 3), (8, 4) & (12, 0)

UNIT – III

Part A

1. Define Graphical Kernel System.
2. What is OpenGL?
3. What is IGES?
4. Define Data Exchange Standards.
5. What is Standards?
6. Write the functions of GKS.
7. List out the international organizations involved to develop the graphics standards.
8. List out the various standards in graphics programming
9. Define Graphics Kernel System (GKS)
10. Enumerate Open Graphics Library.
11. Narrate IRIS GL.
12. Define NAPLPS.
13. Define IGES
14. Define DXF
15. Define STEP
16. Define GKS
17. Define, PHIGS
18. List the various file sections in IGES.
19. List down the requirement s of data exchange.
20. State the methods of data exchange.

Part B

1. Explain the following polyhedral object using b-rep elements and verify the Euler equation for the same

1 Simple polyhedral.

2 Polyhedral object a face may have loops.

3 Objects with holes that do not go through the entire object.

4 Objects have holes that go through entire objects.

2. Sketch the following feature operations using CSG.

1. Extruded 2.revolved feature

3. Chamber 4.loft feature

5. Pocket 6.shell
7. Fillet 8.draft
9. Rib 10.Dimpe.
3. Explain briefly with sketches any six tests used for hidden line identification.
4. Describe the IGES methodology.
5. Describe the PDES methodology.
6. Compare various testing methods of IGES processors.
7. Explain about Graphics Kernel System (GKS).
8. Write short notes on drawing exchange format (DXF) standard.
9. Briefly explain any one of the known graphic standards.
10. Discuss the functions of Software Graphic package.
11. Create a CAD model and obtain the export files in different formats and make a comparative study.

UNIT – IV

Part A

1. How does NC differ from CNC?
2. When do you go for incremental system? Why?
3. List the main elements of NC machine tool.
4. List out the demerits of NC machine.
5. Define continuous path control. .
6. How will you classify the CNC machines based on axis?
7. What are the advantages of CNC machines?
8. How does NC differ from conventional machines?
9. List out the merits of NC machines.
10. What is the use of drawing tool path diagram while using manual part programming?
11. How can one identify a CNC machine?
12. Define subroutine.
13. List the nature of jobs, which are suitable for NC manufacturing.
14. How does CNC increase the precision of a machine tool?
15. Define interpolation.
16. Why do we use stepper motor for axis drive?
17. What is the role of optical grating in CNC drive?
18. Why do we go in for pneumatic chuck in a CNC lathe?
19. Difference between NC lathe and Turning center.
20. What are the parts of a CNC program?
21. What are the disadvantages of manual part programming?
22. What do you meant by “Canned Cycle”?

Part – B

1. Describe the different data input devices of NC machine tool.
2. Explain the working of NC machine tool with the help of the diagram.
3. Describe the constructional details of CNC machine tools.
4. Describe the classifications of CNC based on feedback control system.
5. Describe the various type of CNC machine based on tool motion.
6. Explain the classification of interpolation.
7. Briefly explain the different types of control systems in NC.
8. Describe the features of a machining centre. Why machining centers are particularly advantage for the use of NC.
9. Briefly explain the Canned cycle in manual part programming.
10.With the aid of block diagram explain the steps involved in computer assisted part programming.
11. Briefly explain the process of CALS System.
12.Write a short note on communication standards.
13. Discuss about software used for mechanism simulations.
14. Explain CAD interference checking capabilities.
15. What are the roles of a PLC in a CNC machine?

UNIT – V

Part – A

1. What led to the development of Group Technology?
2. Define part family and machine cell.
3. What is cellular manufacturing?
4. What are the objectives of Group Technology?
5. What is Design part family?
6. What is manufacturing part family?
7. Define Hybrid code.
8. Define MICLASS.
9. Write a short note on DCLASS.
10. What is meant by Production Flow Analysis?
11. Define Composite Part concept.
12. Define FMS.
13. What are the different types of flexibility in FMS?
14. List out the various components of FMS.
15. Mention the commonly used layout for machine cell systems.
16. What are the applications of FMS?
17. List the parameters that must be met for a facility of FMS standards.
18. List the types of quantitative analysis of FMS.

Part – B

1. Enumerate the role of GT in CAD/CAM integration.
2. Briefly discuss the various benefits of implementing a GT in a firm; also bring out the
advantages and limitations of using GT.
3. Define part classification and coding. How is it useful in forming group technology layout?
4. Discuss with examples the following:
(a)Monocode (b)Polycode (c)Mixed code.
5. List the factors to be considered in selecting a suitable classification and coding system.
6. Discuss DC CLASS and MI CLASS coding systems.
7. Discuss DC CLASS and OPITZ coding system with suitable examples.
8. Explain OPITZ parts classification and coding system with examples.
9. Briefly explain the techniques used in Automatic Identification systems for computer
process monitoring.
10. Explain the different flexibilities in FMS.
11. Discuss tool management in relation to the operation of a FMS.
12. What is a FMC? How does FMC ensure flexibility in manufacturing?
13. Describe the additional subsystems that make a machining centre a flexible machining
system.
14. Compare FMS with transfer lines and CNC on the basis of volume and variety of parts
produced..