QUESTION BANK

SUB CODE & NAME: COMPUTER AIDED DESIGN

UNIT I (FUNDAMENTALS OF COMPUTER GRAPHICS)

PART-A

- 1. What is design process?
- 2. Define synthesis.
- 3. What is meant by analysis?
- 4. Define optimization.
- 5. Explain the characteristics of concurrent engineering.
- 6. What is CAD?
- 7. What are the factors considered for selecting CAD?
- 8. Write the benefits of CAD.
- 9. Define Computer Graphics.
- 10. What is transformation? List its types.
- 11. Define Translation.
- 12. What is homogeneous coordinate representation?
- 13. Write the applications of homogeneous coordinate representation.
- 14. Write the features needed to be satisfied for line drawing algorithm.
- 15. Define clipping.
- 16. What is viewing transformation?

PART - B

- 1. Explain product cycle model with flow chart.
- 2. Describe various stages of design process.
- 3. Differentiate sequential and concurrent engineering in detail.
- 4. Explain CAD system architecture with neat sketch.
- 5. Explain 2D and 3D transformation with matrix
- 6. Explain the techniques involved in line drawing algorithm.
- 7. Briefly explain various methods of clipping.
- 8. Explain viewing transformation matrix with neat sketch.

UNIT-II (GEOMETRIC MODELING)

$\mathbf{PART} - \mathbf{A}$

- 1. How curves are represented?
- 2. What are synthetic curves?
- 3. What are Hermite curves?
- 4. How Hermitic curves can be modified?
- 5. What are the limitations of Hermitic curves?
- 6. What are the observations made in Bezier curve?
- 7. What are the advantages of B-spline curve?
- 8. What are rational curves?
- 9. What is surface modeling?
- 10. What are the techniques available for surface modeling?
- 11. List the advantages and disadvantages of CSG model.
- 12. What are the different modeling tools?
- 13. What is geometric modeling?
- 14. What is solid modeling?
- 15. What are the advantages of B-rep?
- 16. List the differences between Bezier curve and Hermite curve.

PART – B

- 1. Explain Hermite curve with neat sketch?
- 2. Explain different types of Bezier Curves in detail.
- 3. Explain B-spline curves and its characteristics.
- 4. Describe various surface modeling with neat sketch.
- 5. Describe construction of "Coons patch".
- 6. Describe the Bicubic patches with mathematical functions.
- 7. Explain the Bezier surface with its properties.
- 8. Explain the construction of B Spline surface with neat sketch.
- 9. Describe the CSG model with suitable example.
- 10. Explain B-rep elements and its data structure.

UNIT –III (VISUAL REALISM) PART – A

- 1. What is visual realism?
- 2. What is rendering?
- 3. What are the various approaches to achieve visual realism?
- 4. What are the difference between object space method and image space methods?
- 5. What are the steps involved in creation of final image?
- 6. List the various test to determine visibility.
- 7. What are silhouette edges?
- 8. Define sorting.
- 9. What is coherence?

- 10. Why removal of hidden line is important?
- 11. State Z buffer algorithm.
- 12. What is ray tracing?
- 13. What is the basic principle of Ray tracing algorithm?
- 14. What is shading?
- 15. State Lambert's Law.
- 16. How the visual realism of images can be enhanced?
- 17. What is a colour model?
- 18. What is computer animation?

PART – B

- 1. Explain Z buffer algorithm with its operations.
- 2. Explain the basic operations in Painter's algorithm.
- 3. Describe the Warnock algorithm with its basic operations.
- 4. Explain the Ray- tracing algorithm with neat sketch.
- 5. Explain various shading techniques with neat sketch.
- 6. Describe the various light sources with example.
- 7. Describe various colour model with neat sketch.
- 8. Explain 2D and 3D animation.
- 9. Describe 'Pseudo code' algorithm for 2D animation.

UNIT -IV (ASSEMBLY OF PARTS)

PART -A

- 1. Why are the needs for assembly modeling?
- 2. What are the main advantages and disadvantages of localized welding?
- 3. What are the advantages and disadvantages of adhesives techniques?
- 4. Define tolerance.
- 5. What is automated assembly?
- 6. What are the considerations in designing that facilities assembly process?
- 7. Why there is a need for tolerances?
- 8. When do we use Geometric tolerances?
- 9. How mass property calculation is applied in CAD/CAM?
- 10. Define simulation.
- 11. What are simulation models?
- 12. How are mechanical systems simulated?
- 13. What is motion simulation?
- 14. List the advantages and disadvantages of mechanical simulation.
- 15. What is interference checking?
- 16. What are the factors that influence interference checking?
- 17. What are the benefits of interchangeable parts?
- 18. Draw a graph plotting the relation between tolerance and cost?

PART –B

- 1. Describe bottom up and top down assembly with example.
- 2. Derive the interference free matrix with example.
- 3. Explain tolerance stack-up with example.
- 4. Describe RSS for tolerance analysis with RSS cube.
- 5. Discuss importance of tolerance analysis.
- 6. Explain the calculating method for center of gravity.
- 7. Describe the calculation of moment of inertia.
- 8. List out and describe various mass properties for a cross section.
- 9. Explain virtual simulation.
- 10. Discuss the applications of simulation.
- 11. Describe CAD interference checking capabilities.

UNIT-V (CAD STANDARDS)

PART-A

- 1. What are the two methods of exchanging data among the CAD/CAM system?
- 2. What is Graphics Kernel System (GKS)?
- 3. When in SET command used in GKS?
- 4. What is bitmap?
- 5. What is a graphics metafile?
- 6. What are metafile standards?
- 7. What is the simplest way to store a bitmap?
- 8. What is directory section in IGES?
- 9. What is open graphics library?
- 10. What is CALS?
- 11. What is a start section/
- 12. Write short notes on error handling.
- 13. What are fiber optic links?
- 14. Write short notes on standards for computer graphics.

PART-B

- 1. Describe graphics standards in graphics programming.
- 2. Explain various layers of GKS.
- 3. Explain OpenGL with schematic diagram.
- 4. Discuss Data exchange standards in detail.
- 5. Describe the structure of IGES file.
- 6. Explain IGES entities with format.
- 7. Explain IGES common testing methods.
- 8. Explain STEP architecture with neat sketch.
- 9. Compare CGM and CGI.