MULTIPLE CHOICE QUESTIONS

SUBJECT: COMPUTER AIDED DESIGN
SUBJECT CODE: 2161903

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Chapter 1: Introduction to computer graphics

1. The graphics can be
   a) Drawing
   b) Photograph,movies
   c) Simulation
   d) All of these
2. Computer graphics was first used by
   a) William fetter in 1960
   b) James fetter in 1969
   c) James gosling in 1991
   d) John Taylor in 1980
3. Types of computer graphics are
   a) Vector and raster
   b) Scalar and raster
   c) Vector and scalar
   d) None of these
4. Pixel can be arranged in a regular
   a) One dimensional grid
   b) Two dimensional grid
   c) Three dimensional grid
   d) None of these
5. Several graphics image file formats that are used by most of graphics system are
   a) GIF
   b) JPEG
   c) TIFF
   d) All of these
6. The ISO standard for computer Graphics is ?
   a) Computer graphics standard
   b) Graphics Standard System
   c) Graphics Kernel System
   d) None of above
7. The main hardware components of a graphics workstation are_____
   a) display devices, recorder
   b) input and out put device
   c) CPU and Display Processor
   d) plotter, joystick

8. In information technology, LCD stands for
   a) Liquid Crystal Display
   b) Low Cost Display
   c) Local Current Directory
   d) Liquid Cathode Display

9. In computer terminology, CRT stands for
   a) Cathode Ray Tube
   b) Computer Remote Terminal
   c) Combat Result Table
   d) Computerized regular Thermography

10. Expansion of line DDA algorithm is
    a) Digital difference analyzer
    b) Direct differential analyzer
    c) Digital differential analyzer
    d) Data differential analyzer

11. Which algorithm is a faster method for calculating pixel positions?
    a) Bresenham's line algorithm
    b) Parallel line algorithm
    c) Mid-point algorithm
    d) DDA line algorithm

12. The disadvantage of line DDA is
    a) Time consuming
    b) Faster
    c) Neither a nor b
    d) None of the mentioned

13. An accurate and efficient raster line-generating algorithm is
    a) DDA algorithm
    b) Mid-point algorithm
    c) Parallel line algorithm
    d) Bresenham's line algorithm

14. In Bresenham's line algorithm, if the distances d1 < d2 then decision parameter Pk is_____
    a) Positive
    b) Equal
    c) Negative
    d) Option a or c

15. On raster system, lines are plotted with
    a) Lines
    b) Dots
    c) Pixels
    d) None of the mentioned

16. The process of determining the appropriate pixels for representing picture or graphics object is known as?
    a) representation
    b) rasterization
    c) animation
    d) Both (a) and (b)

17. Many online animation tools are used to create animation in the form of
    a) JPEG image
    b) PDF image
    c) GIF image
    d) None of these

18. The space in which the image is displayed are called
    a) Screen coordinate system
    b) Clipping window
    c) World coordinate system
    d) None of these

19. The rectangle space in which the world definition of region is displayed are called
    a) Screen coordinate system
    b) Clipping window or world window
    c) World coordinate system
    d) None of these

20. The object space in which the application model is defined
    a) Screen coordinate system
    b) Clipping window or world window
    c) World coordinate system
    d) None of these

21. Bresanham circle algorithm uses the approach of
    a) Midpoint
    b) Point
    c) Line
    d) None of these

22. Initial Graphic Exchange Specification (IGES) is:
    a) A modeling kernel used by several solid modeling CAD packages
    b) A way in which data is stored within a CAD database
    c) A reference to a surface meshing technique
    d) A standard format in which the drawing geometry of a 3D model can be exported for use by other CAD systems

23. The light pen is an
    a. Graphics input device
    b. Graphics output device
    c. Both a & b
    d. None of these

24. The component of interactive computer graphics are
    a. A light pen
    b. Display unit
    c. Bank of switches
    d. All of these

25. A wireless mouse works on
    a. Infra blue radiation
    b. Infra red radiation
    c. Infra green radiation
    d. None of these

26. A wireless mouse consists of _____parts
    a) One
    b) Two
    c) Three
    d) None of these

27. The parts of wireless mouse is
    a) Cable and a mouse
    b) USB and a mouse
    c) CPU and a mouse
    d) None of these

Chapter 2: Curves and Surfaces:

1. The types of spline curve are
   a) Open spline
   b) Closed spline
   c) Both a & b
   d) None of these
2. Cubic spline are
   a) Simple to compute
   b) Provides continuity of curves
   c) Both a & b
   d) None of these
3. Pixel on the graphics display represents?
   a) picture
   b) voltage values
   c) mathematical point
   d) a region which theoretically can contain an infinite number of points
4. Bezier sp line always passes through
   a. First and second control point
   b. Does not pass from First and second control point
   c. Both a & b
   d. None of these
5. The object refers to the 3D representation through linear, circular or some other representation are called
   a. Quadric surface
   b. Sweep representation
   c. Torus
   d. None of these
6. The Bezier curve obtained from the four control points is called a
   a. Square Bezier curve
   b. Cubic Bezier curve
   c. Hectare Bezier curve
   d. Rectangle Bezier curve
7. The shape of a Bezier curve primarily depends upon the
   a. Position of control points
   b. Distance of control points
   c. Position of control panel
   d. None of these

8. The no of control points in a Bezier curve ensures the
    a. Jaggies of curve
    b. Smoothness of curve
    c. Straightness of curve
    d. None of these
9. More the control points of a Bezier curve,_____ quality of the curve
    a. Higher
    b. Lower
    c. Bad
    d. None of these
10. The sweep representation of an object refers to the
    a. 2D representation
    b. 3D representation
    c. Both a & b
    d. None of these
11. The problem of discontinuity of lines is known as
    a. Jaggies
    b. Stair-casing
    c. Both a & b
    d. None of these
12. _____curve is one of the sp line approximation methods
    a. Bezier
    b. Ellipsoid
    c. Shearing
    d. None of these
13. A Bezier curve is a polynomial of degree _____the no of control points used
    a. One more than
    b. One less than
    c. Two less than
    d. None of these
14. NURBS curves can be used to generate:
    a) Planes
    b) Arcs
    c) Free-form curves
    d) Cylinders
    e) All of the above

Chapter 3: Mathematical representation of solids:

1. _____refer to the shapes created by union, intersection and difference of given shapes.
   a) Wire frame model
   b) Composite transformation
   c) Constructive solid geometry methods
   d) None of these

2. _____refer to a model that represent all the dimension of an object external as well as internal.
   a) Wire frame model
   b) Constructive solid geometry methods
   c) Composite transformation
   d) None of these

3. _____refers to the result obtained by multiplying the matrix of the individual transformation representation sequences
   a) Wire frame model
   b) Constructive solid geometry methods
   c) Composite transformation
   d) None of these

4. The projection in which the projection plane is allowed to intersect the x, y and z-axes at equal distances
   a) Wire frame model
   b) Constructive solid geometry methods
   c) Isometric projection
   d) Back face removal

5. In which projection ,the plane normal to the projection has equal angles with these three axes
   a) Wire frame model
   b) Constructive solid geometry methods
   c) Isometric projection
   d) Back face removal

6. _____is a simple object space algorithm that removes about half of the total polygon in an image as about half of the faces of objects are back faces
   a) Wire frame model
   b) Constructive solid geometry methods
   c) Isometric projection
   d) Back face removal

7. By which ,we can take a view of an object from different directions and different distances
   a) Projection
   b) Rotation
   c) Translation
   d) Scaling

8. Parallel projection shows the
   a) True image of an object
   b) True size of an object
   c) True shape of an object
   d) all of these

9. Projection rays(projectors) emanate from a
   a) COP(centre of projection)
   b) Intersect projection plane
   c) Both a & b
   d) None of these

10. The centre of projection for parallel projectors is at
    a) Zero
    b) Infinity
    c) One
    d) None of these

11. In orthographic projection, engineering use
    a) Top view of an object
    b) Front view of an object
    c) Side view of an object
    d) All of these

12. The orthographic projection that show more than one side of an object are called
    a) Axonometric projection
    b) Isometric projection
    c) Both a & b
    d) None of these

13. The projection that can be viewed as the projection that has a centre of projection at a finite distance from the plane of projection are called
    a) Parallel projection
    b) Perspective projection
    c) Isometric projection
    d) None of these

14. The perspective projection is more practical because the distant objects appear
    a) Smaller
    b) Larger
    c) Neither smaller nor larger
    d) None of these

15. In choosing the right modeling method, which of the following is a key consideration?
    a) software capabilities
    b) time to model part
    c) accuracy
    d) end uses of model
    e) all of the above

16. Which of the following is the least likely to benefit from solid modeling?
    a) Civil mapping
    b) Finite Element Analysis
    c) Product design
    d) Machine design

17. Which of the following 3D modeling methods cannot be shaded to look like a realistic object?
    a) Surface modeling
    b) Solid modeling
    c) Parametric modeling
    d) Wireframe modeling

18. Wireframe modeling software has the following advantage over solid modeling software:
    a) Modeling complex shapes
    b) Low-cost
    c) Surface area and volume calculations
    d) Visualization

19. Which of the following is not a basic method to create a surface model?
    a) Boolean operations
    b) Revolution
    c) Extrusion
    d) Spline approximations

20. Which of the following is not a modeling kernel used by many solid modeling software packages?
    a) Parasolid
    b) Proprietary
    c) CSG
    d) None of above

Chapter 4: Geometric Transformations:

1. Basic geometric transformation include
   a) Translation
   b) Rotation
   c) Scaling
   d) All of these
2. Some additional transformations are
   a) Shear
   b) Reflection
   c) c Both a & b
   d) None of these
3. The transformation in which an object is moved in a minimum distance path from one position to another is called,
   a) Translation
   b) Scaling
   c) Rotation
   d) Reflection
4. The transformation in which an object is moved from one position to another in circular path around a specified pivot point is called,
   a) Translation
   b) Scaling
   c) Rotation
   d) Reflection
5. The transformation in which the dimension of an object are changed relative to a specified fixed point is called
   a) Translation
   b) Scaling
   c) Rotation
   d) Reflection
6. The selection and separation of a part of text or image for further operation are
   a) Translation
   b) Shear
   c) Reflection
   d) Clipping

7. The complex graphics operations are,
   a) Selection
   b) Separation
   c) Clipping
   d) None of these

8. In computer graphics, a graphical object is known as,
   a) Point
   b) Segment
   c) Parameter
   d) None of these

9. An object can be viewed as a collection of
   a) One segment
   b) Two segment
   c) Several segments
   d) None of these

10. Every segment has its own attributes like
    a) Size, visibility
    b) Start position
    c) Image transformation
    d) All of these

11. By using the attributes of segment , we can_____ any segment
    a) Change
    b) Control
    c) Print
    d) None of these

12. A two-dimensional array contain the details of all the segment are called
    a) Segmentation table
    b) Segment name
    c) Operation
    d) None of these

13. We assign all the attributes of segment under this
    a) Segment name
    b) Segment size
    c) Array
    d) None of these

14. The initial size of segment will be_____
    a) 1
    b) 0
    c) 2
    d) 3

15. Two types of coordinates are
    a) Positive and negative coordinates
    b) Absolute and relative coordinates
    c) Both a & b
    d) None

16. The transformation that produces a parallel mirror image of an object are called
    a) Reflection
    b) Shear
    c) Rotation
    d) Scaling

17. The transformation that disturbs the shape of an object are called
    a) Reflection
    b) Shear
    c) Rotation
    d) Scaling

18. The process of mapping a world window in world coordinate system to viewport are called
    a) Transformation viewing
    b) View Port
    c) Clipping window
    d) Screen coordinate system

19. In which transformation the shape of an object can be modified in x-direction ,y-direction as well as in both the direction depending upon the value assigned to shearing
    a) Reflection
    b) Shearing
    c) Rotation
    d) Scaling

20. The process of extracting a portion of a database or a picture inside or outside a specified region are called
    a) Translation
    b) Shear
    c) Reflection
    d) Clipping

21. The rectangle portion of the interface window that defines where the image will actually appear are called
    a) Transformation viewing
    b) View port
    c) Clipping window
    d) Screen coordinate system

22. A composite transformation matrix can be made by determining the _____of matrix of the individual transformation
    a) Addition
    b) Subtraction
    c) Product
    d) None of these

23. Each successive transformation matrix _____ the product of the preceding transformation
    a) pre-multiples
    b) post-multiples
    c) both a & b
    d) none of these

24. Forming products of transformation matrices is often referred as
    a) Composition of matrix
    b) Concatenation of matrix
    c) Both a & b are same
    d) None of these

25. Two consecutive translation transformation t1 and t2 are
    a) Additive
    b) Subtractive
    c) Multiplicative
    d) None of these

26. Two consecutive rotation transformation t1 and t2 are
    a) Additive
    b) Subtractive
    c) Multiplicative
    d) None of these

27. Two consecutive scaling transformation t1 and t2 are
    a) Additive
    b) Subtractive
    c) Multiplicative
    d) None of these

Chapter 5: Finite Element Analysis:

1. The finite element method formulation of the problem results in a system of
   a) algebraic equations
   b) logical equations
   c) Arthimatic equations
   d) flow equations
2. FEM gives accurate representation of
   a) real geometry
   b) complex geometry
   c) real and complex geometry
   d) constant geometry
3. Finite element method is also called
   a) infinite element analysis
   b) frequency element analysis
   c) finite element analysis
   d) partial element analysis
4. Numerical algorithms are based on
   a) FEM and FDTD
   b) FEM and IFEM
   c) TD and FD
   d) FEM and FD
5. To solve the FEM problem, it subdivides a large problem into smaller, simpler parts that
   are called
   a) finite elements
   b) infinite elements
   c) dynamic elements
   d) static elements
6. A three noded triangular element is called as
   a) linear strain triangular element
   b) constant strain triangular element
   c) varaiable strain triangular element
   d) differable strain triangular element
7. A triangular plane stress element has_____degree of freedom
   a) 3
   b) 4
   c) 5
   d) 6

8. Number of displacement polynomials used for an element depends on
   a) Nature of element
   b) type of an element
   c) degrees of freedom
   d) nodes

9. In weighted residual technique,the methods adopted are
   a) point collocation method
   b) least squares method
   c) galerkin's method
   d) all

10. The higher order elements are also called as
    a) complex elements
    b) compound element
    c) linear element
    d) none

11. The eight node quadrilateral element belongs to…………. Family fo elements
    a) Serendipity
    b) interdipity
    c) sardipity
    d) none

12. The displacement function for 1-D ,two node linear element in terms of shape function will be
    a) u = N1u2 + N2u1
    b) u = N2 u1 + N1u2
    c) u = N1u1+N2u2
    d) u = N1u1+N1u2

13. On gathering stiffness and loads, the system of equations is given by
    a) KQ=F
    b) KQ≠F
    c) K=QF
    d) K≠QF

14. A six noded triangular element is known as
    a) linear strain triangular element
    b) constant strain triangular element
    c) varaiable strain triangular element
    d) differable strain triangular element

15. The art of subdividing a structure int a convenient number of smaller components isCalled
    a) discretization
    b) numbering of nodes
    c) continumm
    d) both a &b
16. A three noded triangular element is called as
    a) linear strain triangular element
    b) constant strain triangular element
    c) varaiable strain triangular element
    d) differable strain triangular element
17. The geometry and other parameters of an element in terms of only one spatial coordinate then the element is
    a) 2 dimensional
    b) one dimensional
    c) three dimensional
    d) none
18. The finite element method is mostly used in the field of
    a) structural mechanics
    b) classical mechanics
    c) applied mechanics
    d) engg mecahnics
19. FEM cant produce exact results as those of…………methods
    a) analytical
    b) logical
    c) theoritical
    d) all the above
20. 16 Sum of all shape functions is equal to
    a) Zero
    b) -1
    c) +1
    d) 2
21. The higher order elements are also called as
    a) complex elements
    b) compound element
    c) linear element
    d) none

22. At Fixed support The displacements are equal to ……………………………
    a) 1
    b) 2
    c) 3
    d) 0

23. FEM also operates the parameters like
    a) heat transfer
    b) temperature
    c) both A&B
    d) none

24. The sub domains are called as
    a) Particles
    b) molecules
    c) elements
    d) None

25. If any element is specified by the polynomial of the order of two or more, the element is known as,
    a) non linear element
    b) higher order element
    c) both A&B
    d) none

26. The shape function of the beam elements are known as
    a) hermite shape functions
    b) element shape functions
    c) hermite element functions
    d) both A&B

27. FEM also operates the parameters like
    a) heat transfer
    b) temperature
    c) both A&B
    d) none

28. The total potential energy is the algebraic sum of
    a) integral strain energy and work potential
    b) integral strain energy and external work done
    c) integral stress energy and work potential
    d) integral stress energy and external work done

29. In FEM the complex domain defining a continuum is divided into
    a) points
    b) elements
    c) traiangles
    d) none

30. The numbers of nodes for 1 D element are...
    a) 1
    b) 2
    c) 3
    d) none

31. Finite element analysis deals with
    a) approximate numerical solution
    b) non boundary value problems
    c) partial differential equations
    d) Laplace equations

32. The sum of shape functions is always
    a) 1
    b) 0
    c) infinite
    d) None

33. Stiffness matrix depends on
    a) material
    b) geometry
    c) both
    d) none

34. The sub domains are called as
    a) particles
    b) molecules
    c) elements
    d) None

35. If any element is specified by the polynomial of the order of two or more, the element is known as,
    a) non linear element
    b) higher order element
    c) both A&B
    d) none

36. The force required to produce unit displacement is
    a) pressure
    b) traction
    c) stiffness
    d) none

37. The distributed force per unit area on the surface of the body is
    a) pressure
    b) surface tension
    c) traction
    d) none

38. Domain is divided into some segments called
    a) finite element
    b) stiffness matrix
    c) node function
    d) shape function

39. Unit of body force acting on every elemental volume of the body is
    a) force per unit area
    b) force per unit length
    c) force per unit volume
    d) force per unit time

40. _____ are used to find the nodal displacements in all parts of element
    a) shape function
    b) node function
    c) element function
    d) coordinate function

41. The _____ is the numerical method for solving complex problems in wide variety of engineering fields
    a) FEA
    b) computational analysis
    c) ansys
    d) ANSA

42. The nature of loading at various locations and other surfaces conditions called
    a) boundary condition
    b) traction
    c) friction
    d) surfacing

43. Example of 1-D Element
    a) Bar
    b) Triangle
    c) Square
    d) Tetrahedron

44. The art of sub dividing a structure into a convenient number of smaller components is known as
    a) node
    b) elementization
    c) discretization
    d) numbering

45. The point in the entire structure is defined using coordinates system is known as
    a) local coordinate
    b) natural coordinate
    c) region coordinate
    d) global coordinate

46. _____magnitude never exceeds unity
    a) local coordinate
    b) natural coordinate
    c) region coordinate
    d) global coordinate

47. The shape function has…value at one nodal poi nt and…value at other nodal point
    a) unity, negative
    b) positive, negative
    c) unity, zero
    d) high, low

48. A small unit having definite shape of geometry and node is known as
    a) Discrete element
    b) finite element
    c) assembled element
    d) Infinite element

49. Example for one – Dimensional element is …..
    a) Triangular element
    b) Brick element
    c) Truss element
    d) Axisymmetric element

50.   The state of stress for a three dimensional body has ——— components.
   a)   six
   b)   three
   c)   two
   d)   four

51.   The determinant of an element stiffness matrix is always
   a)   one
   b)   zero
   c)   depends on size of [K]
   d)   Two

52.   Finite element analysis deals with
   a)   Approximate numerical solutions
   b)   Non boundary value problems
   c)   Partial Differential equations
   d)   All the above

53.   How many nodes are in 3-D brick element
   a)   3
   b)   6
   c)   5
   d)   8

54.   A Deformable system is in equilibrium, if the first variation in the total P.E of the system is zero'refers to
   a)   theorem of stationary P.E
   b)   theorem of virtual work
   c)   theorem of virtual displacement
   d)   bettis theorem

55.   In one of the property of shape function, summation of shape function [Σfi] is
   a)   n
   b)   2n
   c)   1
   d)   0

56.   In case of a truss member if there are 3 nodes and each node 2 DOF, then the order of
      Stiffness matrix is
   a)   2x2
   b)   3x3
   c)   2x3
   d)   6x6

57. The size of the stiffness matrix is equal to the degree of freedom of the
   a) element
   b) node
   c) shape function
   d) beam

58. In FEM the degree of freedom is often called as
   a) shape function
   b) nodal displacement
   c) element matrix
   d) coordinates

59. The final global finite element equation for the complete structure can be written in the
   Matrix form,
   a) $\{F\}=[k]+\{u\}$
   b) $\{F\}=[k]-\{u\}$
   c) $\{F=[k]\{u\}$
   d) $\{F=[k]/\{u\}$

60. The number of shape functions will be equal to the number of
   a) nodes of element
   b) elements of the structure
   c) size of the structure
   d) coordinates

61. At Fixed support the displacements are equal to ……………………………
   a) 1
   b) 2
   c) 3
   d) 0

62. LST element has _____nodes.
   a) 3
   b) 4
   c) 5
   d) 6

63. _____ elements are preferred to four node rectangular elements.
   a) Triangular
   b) square
   c) orthogonal
   d) None

64. First derivatives of the three node elements are called as,
    a) CST
    b) LST
    c) VST
    d) None

65. In CST element _____ is constant.
    a) Stress
    b) Strain
    c) shape function
    d) All

66. In local co-ordinate system the nodes of the structure are specified by the _____.
    a) Origin
    b) End points
    c) Any point on the element
    d) None

67. In local co-ordinate system _____case letters are preferred.
    a) Upper
    b) Lower
    c) both a & b
    d) None

68. The two dimensional elements are called _____elements.
    a) Para symmetric
    b) dia symmetric
    c) Axi symmetric
    d) All

69. To convert Cartesian co-ordinates in to local co-ordinates we use_____ matrix method.
    a) Crammer
    b) Henry
    c) Jacobian
    d) None

70. If the geometry and field displacement variables of the elements are described by the same shape functions, then these elements are called_____.
    a) Iso Parametric
    b) Axi Symmetric
    c) Super parametric
    d) Sub Parametric

71. In FEA, to evaluate the strain displacement matrix we use_____ method.
    a) Crammer
    b) Henry
    c) Jacobian
    d) None
72. The steady state problems are those which are independent of _____ .
    a) time
    b) temperature
    c) pressure
    d) all of the above
73. Based on which parameter an polynomial function can be chosen_____
    a) Nodes
    b) Nodal points
    c) Nodal displacements
    d) Elements
74. The truss element can resist only
    a) axial force
    b) surface force
    c) point load
    d) none
75. The truss element can deform only in the
    a) axial direction
    b) vertical direction
    c) horizontal directional
    d) inclined direction