1. If a client of yours is having difficulty visualizing a design, what type of drawing would be the easiest to understand?

A) axonometric  
B) three-view orthographic  
C) one-view orthographic  
D) bimetric  
ANS: A

2. Which of the following is not a pictorial drawing?

A) isometric  
B) multiview  
C) perspective  
D) axonometric  
ANS: B

3. Which of the following projection methods does not use projectors perpendicular to the projection plane?

A) isometric  
B) orthographic  
C) oblique  
D) axonometric  
ANS: C

4. A circle will appear on an isometric drawing as a(n) __________.

A) ellipse  
B) cycloid  
C) circle  
D) parabola  
ANS: A

5. An axonometric drawing which has two axes divided by equal angles is:

A) dimetric
B) trimetric
C) orthographic
D) isometric
ANS: A

6. An axonometric drawing which has all three axes divided by equal angles is:
A) dimetric
B) trimetric
C) orthographic
D) isometric
ANS: D

7. In a trimetric drawing, the relationship of the angle between axes to each other is:
A) three are equal
B) two are equal
C) three are unequal
D) none of the above
ANS: D

8. In an isometric sketch of a cube:
A) the frontal face appears in its true shape
B) the receding axes are at 45 degrees to the horizontal
C) all faces are equally distorted
D) only the depth distances must be reduced
ANS: C

9. In isometric drawings:
A) Two axes are perpendicular
B) True measurements can be made only along or parallel to the isometric axes
C) All faces are unequally distorted
D) None of the above
ANS: B

10. In an axonometric drawing, the projection rays are drawn ________ to each other and _______ to the plane of
projection.
A) parallel.....oblique
B) oblique.....parallel
C) parallel.....perpendicular
D) parallel....parallel
ANS: C

11. One method of drawing an ellipse that represents an isometric pictorial circle is known as:
A) the box construction method
B) the coordinate construction method
C) the four-center approximation method
D) the offset construction method
ANS: A

12. Non-isometric lines are located and sketched how?
A) They are drawn parallel to the isometric axis.
B) They are measured using the angle from the multiview.
C) They are measured using a non-isometric template.
D) They are located by determining the endpoints of the non-isometric line.
ANS: D

13. In an oblique sketch of a cube:
A) the frontal face appears in its true shape
B) both receding axes are at 30 degrees to the horizontal
C) all faces are equally distorted
D) the depth distances must be reduced
ANS: A

14. In an oblique drawing, all of the following angles are commonly used for drawing the depth axis, except:
A) 30°
B) 45°
C) 60°
D) 90°
ANS: D

15. In an oblique drawing, the projection rays are drawn _______ to each other and _______ to the plane of projection.

A) oblique.....oblique
B) oblique.....parallel
C) parallel.....oblique
D) parallel....parallel

ANS: C

16. All of the following are processes (as opposed to input or output) in a manufacturing business except:

A) Material
B) Planning
C) Documenting
D) Designing

ANS: A

17. following operations can make use of the CAD database, except:

A) Designing
B) Marketing
C) Producing
D) None of the above

ANS: D

18. Which of the following is the responsibility of the production manager?

A) people
B) plants
C) processes
D) all of the above
19. Which of the following would be a typical use for Product Data Management?

A) tracking potential clients by Marketing
B) generating variations of a preliminary design
C) searching for how many designs used a particular fastener
D) evaluating the strength of a rib support on a cast piece

ANS: C

20. Which design process involves responding to the emotional needs of the consumer?

A) aesthetic design
B) functional design
C) systems design
D) e-business

ANS: A

21. Which network system gives outside vendors access to a company's internal network?

A) Intranet
B) Extranet
C) Internet
D) Outernet

ANS: B

22. All of the following are part of a typical design team, except:

A) vendors
B) quality control specialists
C) manufacturing engineers
D) accountants

ANS: D
23. Which of the following input devices does not translate hand movements into instructions for the computer?
A) Scanner
B) Mouse
C) Keyboard
D) 3D Mouse
ANS: A

24. Which type of output device creates images which look and feel like photographs?
A) Electrostatic plotter
B) Laser printer
C) Dye-sublimation printer
D) Inkjet plotter
ANS: C

25. Which tool can be used to draw a 90 degree angle?
A) 30/60 triangle
B) protractor
C) drafting machine
D) all of the above
ANS: D

26. Which set of lead grades has a grade out of sequence?
A) H, HB, B, 3B
B) 7B, H, F, 3H
C) 6B, B, H, 4H
D) 9H, HB, B, 2B
ANS: B

27. Which type of line is part of a dimension?
A) break lines
B) phantom lines
C) extension lines
D) cutting plane lines
ANS: C

28. Which type of line is particular to section drawings?
A) break lines
B) phantom lines
C) extension lines
D) cutting plane lines
ANS: D

29. Which angle cannot be made with either a 45 or 30/60 triangle or a combination of the two?
A) 90
B) 70
C) 30
D) 15
ANS: B

30. A drawing instrument set usually contains all of the following, except:
A) bow compass
B) scale
C) dividers
D) extra leads
ANS: B

31. Which of the following operating systems is used with CAD systems?
A) DOS
B) UNIX
C) Linux
D) all of the above
ANS: D

32. Which line type is thin and light?
A) visible lines
B) center lines
C) construction lines
D) all of the above
ANS: C

33. Which line type is thick and black?
A) visible lines
B) center lines
C) construction lines
D) all of the above
ANS: A

34. What type of sketches are typically used in the refinement stage of the design process?
A) isometric
B) document
C) oblique
D) ideation
ANS: B

35. What type of sketch incorporates convergence?
A) isometric
B) perspective
C) oblique
D) multiview
ANS: B

36. What type of sketch shows the front in true shape?
A) isometric
B) perspective
C) oblique
D) axonometric
ANS: C

37. What is the major difference(s) between perspective and parallel projection?
A) Parallel projection can only be used with objects containing parallel edges.
B) Perspective projection gives a more realistic representation of an object.

C) Parallel projection is equivalent to a perspective projection where the viewer is standing infinitely far away.

D) Perspective projection can only be used for creating oblique and not isometric pictorials.

E) b and c

ANS: E

38. What type of sketch uses a miter line?

A) a two-view multiview

B) an isometric pictorial

C) a three-point perspective pictorial

D) a three-view multiview

ANS: D

39. Which type of line has precedence over all other types of lines?

A) a hidden line

B) a center line

C) a visible line

D) none of the above

ANS: C

40. Which statement(s) is true about the precedence of lines?

A) a hidden line has precedence over a center line

B) a center line has precedence over a visible line

C) a visible line has precedence over a miter line

D) all of the above

ANS: A

41. Where do the projection lines converge in a perspective sketch?

A) the vanishing point

B) the ground line

C) the horizon line

D) the eye point

ANS: A
42. When you want to make the letters of a line of text narrower, you would set its:

A) aspect
B) scale
C) alignment
D) font

ANS: A

43. When you want to make sure that all of the text stays to the right of a given point on the drawing, you would set its:

A) aspect
B) scale
C) alignment
D) font

ANS: C

44. Which of the following is typically represented in a drawing but does not have a true physical counterpart on the object?

A) edge of planar surface
B) edge of a circular face
C) corner of a rectangle
D) limiting element of a curved surface

ANS: D

45. A cutting plane normal to a face of a cube has to be __________ in order to cut an oblique face.

A) rotated about one axis
B) rotated about one axis and translated
C) rotated about two axes
D) rotated about two axes and translated

ANS: C

46. All of the following are variables involved in the use of image planes, except:

A) the object being viewed
B) the size of the object
C) the eye of the viewer
D) the image plane
ANS: B

47. In a VR system, all of the following statements about immersiveness are true, except:
A) response time is an important factor
B) both display resolution and display size can affect it
C) the visual sense is the only sense to affect it
D) tracking body movement is an important factor
ANS: C

48. Imagine a "L" shaped face extruded into three dimensions. How many faces does it contain?
A) seven
B) eight
C) ten
D) six
ANS: B

49. Which type of variable is the following list: Texas, Utah, California, Delaware?
A) Nominal
B) Ordinal
C) Scalar
D) Vector
ANS: A

50. Which type of variable is the following list: Thinnest, Thin, Medium, Fat, Fattest?
A) Nominal
B) Ordinal
C) Scalar
D) Vector
ANS: B

51. A dependent variable is derived by subtracting the temperature reading on Gauge A from the reading on Gauge B. This
variable would be a _________ variable.
A) ratio
B) independent
C) interval
D) absolute
ANS: C

52. A dependent variable is derived by measuring the distance a ball lands from a marker. This variable would be a _________ variable.
A) ratio
B) independent
C) interval
D) absolute
ANS: D

53. The direction and velocity of air currents can be expressed as a:
A) Scalar
B) Vector
C) Tensor
D) two of the above
ANS: D

54. All of the following are simple marks, except:
A) lines
B) points
C) arrows
D) areas
ANS: C

55. Which of the following is not a technique normally used with a surface plot?
A) hidden line removal
B) color coding based on z value
C) specular reflection
D) Gouraud shading
ANS: C

56. All of the following are common methods used for solving descriptive geometry problems except:
A) direct view method
B) reference plane method
C) fold-line method
D) revolution method
ANS: B

57. All of the following statements about creating a point view of a line are true, except:
A) the line of sight must be parallel to the line
B) two auxiliary views are needed off an oblique line
C) it will never be seen in one of the principal views
D) it is used to show the edge view of a plane
ANS: C

58. Graphically, planes can be represented as:
A) three non-linear points
B) a point and a line
C) two intersecting lines
D) all of the above
ANS: D

59. Which coordinate system uses two angles and one distance?
A) world
B) spherical
C) local
D) cylindrical
ANS: B

60. Which coordinate system uses two distances and one angle?
A) world
B) spherical
C) local
D) cylindrical
ANS: D

61. If you are going to create a tangent arc between two arcs that cannot intersect, to find the center of the tangent arc you must set your compass to a radius that is:
A) the existing arc radius minus the tangent arc radius
B) centered at the tangent point of the new arc and the existing arc
C) the existing arc radius plus the tangent arc radius
D) the sum of the two existing arc radii
ANS: C

62. ________ do not define a plane.
A) Two parallel lines
B) Three points
C) Two skew lines
D) A line and a point
ANS: C

63. What type of curve is created by the intersection of a plane parallel to the side of a cone?
A) parabola
B) hyperbola
C) ellipse
D) roulette
ANS: A
64. What type of curve is created by the intersection of a plane with a cone which makes an angle with the axis greater than the angle between the side of the cone and the axis?

A) parabola  
B) hyperbola  
C) ellipse  
D) roulette  
ANS: C

65. a (n) ________ is created by the motion of a point on a circle as the circle rolled along a straight line

A) epicycloid  
B) hyperbola  
C) cycloid  
D) spiral  
ANS: C

66. When making a 'pipe' with a ruled surface, the ________ determines whether the pipe is straight or curved.

A) generator  
B) generatrix  
C) cutting plane  
D) directrix  
ANS: D

67. The path that a generatrix follows is called the:

A) parabola  
B) b-spline  
C) ruler  
D) directrix  
ANS: D

68. Another name for a cube is a

A) hexahedron.  
B) tetrahedron.
C) isocahedron.
D) octahedron.
ANS: A

69. A(n) ________ cone has two planar surfaces parallel to each other
A) truncated
B) frustrum
C) right
D) oblique
ANS: B

70. The selection of the front view in executing a multiview drawing of an object is dependent upon the following factors:
A) size and shape of the object and their relationship to all views.
B) the number of principal views required and the related auxiliary views needed to describe the object.
C) the greatest contour shape, the related dashed lines, and the position of use.
D) the size of the object, size of the paper, position of use, and least number of hidden lines.
ANS: D

71. All of the following statements about multiview drawings are true, except:
A) each view is a 3-D pictorial image
B) based on orthographic projection
C) at least two views of the object
D) views are defined by planes of projection
ANS: A

72. Which type of projection does not have the projection rays parallel to each other?
A) axonometric projection
B) oblique projection
C) orthographic projection
D) perspective projection
ANS: D

73. Which is not a principal view?
A) bottom
B) left side
C) auxiliary
D) front
ANS: C

74. Principle planes will appear as:
A) normal planes or edges
B) oblique planes or edges
C) normal planes or oblique planes
D) skewed planes or edges
ANS: A

75. In orthographic projection, visual rays or lines of sight for a given view are __________ to each other.
A) perpendicular
B) oblique
C) normal
D) parallel
ANS: D

76. What two types of projections give a pictorial view of the object without convergence?
A) orthographic and perspective
B) oblique and axonometric
C) perspective and oblique
D) isometric and orthographic
ANS: B

77. Inclined planes in a three-view drawing will appear as:
A) two surfaces and one edge
B) two edges and one surface
C) three edges
D) foreshortened in each view
ANS: A

78. Oblique planes in a three-view drawing will appear as:
A) two surfaces and one edge
B) two edges and one surface
C) three edges
D) three surfaces
ANS: D

79. Normal planes in a three-view drawing will appear as:
A) one surface and two edges
B) three surfaces
C) one edge and two surfaces
D) three edges
ANS: A

80. A viewing direction which is perpendicular to the surface in question gives a(n) __________ view.
A) inclined
B) normal
C) oblique
D) perspective
ANS: B
81. A viewing direction which is parallel to the surface in question gives a(n) __________ view.
   A) inclined
   B) normal
   C) edge
   D) perspective
   ANS: C

82. When a surface of an object is inclined to a plane of projection, it will appear ______________ in the view.
   A) foreshortened
   B) in true size and shape
   C) as a line
   D) as a point
   ANS: A

83. What are the three principle planes in orthographic projection?
   A) front, top, profile
   B) back, top, profile
   C) top, front, right side
   D) frontal, horizontal, profile
   ANS: D

84. The top view of an object should typically be drawn:
   A) to the right of the front view.
   B) anywhere on the same page.
   C) directly above the front view.
   D) on a separate piece of paper.
   ANS: C

85. A horizontal surface of a multiview drawing will appear as a(n) ____________ in the front view.
   A) edge
   B) normal surface
   C) point
D) foreshortened surface
ANS: A

86. Which view is usually developed first, contains the least amount of hidden lines, and shows the most contours in multiview drawings?
A) right side
B) top
C) back
D) front
ANS: D

87. A sphere can be described in how many views?
A) 4
B) 3
C) 2
D) 1
ANS: D

88. An asymmetric object is usually described by how many views?
A) 6
B) 3
C) 4
D) 2
ANS: B

89. An axially symmetric object, such as one turned on a lathe, normally can be shown in ________ view(s).
A) one
B) two
C) three
D) four
ANS: B

90. In orthographic projection, visual rays are _________ to the projection plane.
A) parallel  
B) adjacent  
C) perpendicular  
D) tangent  
ANS: C

91. The top and right side views have what common dimension(s)?
A) height and width  
B) width and depth  
C) height  
D) depth  
ANS: D

92. For orthographic projection, the engineering custom in the United States dictates the use of:
A) first-angle projection  
B) second-angle projection  
C) third-angle projection  
D) fourth-angle projection  
ANS: C

93. For orthographic projection, the engineering custom in Europe dictates the use of:
A) first-angle projection  
B) second-angle projection  
C) third-angle projection  
D) fourth-angle projection  
ANS: A

94. The sequence for the direction of view (or line of sight) for any orthographic projection as utilized in the United States is:
A) eye of observer>projection plane>object  
B) eye of observer>object>projection plane  
C) projection plane>object>eye of observer  
D) projection plane>eye of observer>object
95. Depending on its relationship to the projection plane on which the view is projected, a line may project:
   A) true length
   B) foreshortened
   C) as a point
   D) all of the above
   ANS: D

96. If a surface on an object is parallel to one of the principal planes of projection, then the angular relationship of that surface to at least two other principal projection planes is:
   A) parallel
   B) perpendicular
   C) inclined
   D) unknown
   ANS: B

97. Good practice dictates that the characteristic contour shape of the object be shown in what view?
   A) top
   B) front
   C) right side
   D) any side
   ANS: B

98. The height, width, and depth of an object can be shown with a minimum of how many orthographic projection views?
   A) six
   B) three
   C) two
   D) four
   ANS: C

99. Which of the following pairs of orthographic views both show the height dimension?
A) left side and front
B) top and front
C) top and rear
D) bottom and right side
ANS: A

100. A title block contains all of the following information, except:
A) name and address of the company
B) parts list
C) drawing sheet size letter designation
D) drawing number
ANS: B

101. An assembly drawing normally consists of all of the following pieces, except:
A) parts drawn in their operating position
B) detail numbers of the parts
C) engineering change orders
D) bill of materials
ANS: C

102. A balloon:
A) often shows up on assembly drawings
B) contains part number information
C) indicates the scale of a removed detail
D) appears at the end of a leader
ANS: C

103. An engineering change note would be placed:
A) with the other notes in the drawing area
B) on a sheet attached to the detail drawing
C) in the bill of materials
D) in the revision block
ANS: D
104. Which reproduction process allows for change of scale of the drawing?

A) microfilming  
B) diazo  
C) xerography  
D) two of the above  

ANS: D

105. All of the following distinguish digital document management technologies from traditional document management, except:

A) plotters can produce drawings much quicker than by hand  
B) drawings can be stored on electronic media for later retrieval  
C) database tools can be used to manage and organize product information  
D) drawing files can be instantly transported long distances  

ANS: A