Computer Graphics and Animation MCQ Questions and Answers

Unit:2 2D and 3D Transformation

Multiple Choice Questions and Answers

1. A translation is applied to an object by :

(a) Repositioning it along with a straight-line path

(b) Repositioning it along with a circular path

(c) Repositioning it along with an elliptical path

(d) All of these

2. We translate a two-dimensional point by adding:

(a) Translation distances

(b) Translation difference

(c) Both A & B

(d) None of these

3. Translation factor **(t_x, t_y)** is called as:

(a) Translation vector

(b) Shift vector

(c) a and b both

(d) None of these

4. To change the position of a circle or ellipse we translate :

(a) Center coordinates

(b) Center coordinates and redraws the figure in a new location

(c) Outline coordinates

(d) All of these

5. The basic geometric transformations are:

(a) Rotation

(b) Reflection

(c) Shear

(d) All of these

6. A two-dimensional rotation is applied to an object by :

(a) Repositioning it along with a straight-line path

(b) Repositioning it along with a circular path

(c) Repositioning it along with an elliptical path

(d) None of these

7. Positive values for the rotation angle define:

(a) Counterclockwise rotations about the endpoints

(b) Counterclockwise translation about the pivot point

(c) Counterclockwise rotations about the pivot point

(d) Clockwise rotations about the pivot point

8. _____ is the rigid body transformation.

(a) Scaling

(b) Shear

(c) Rotation

(d) None of these

9. The transformation that produces a mirror image of an object relative to an axis is called :

(a) Rotation

(b) Translation

(c) Reflection

(d) All of these

10. A transformation that slants the shape of objects is called :

(a) Shear

(b) Translation

(c) Reflection

(d) All of these

11. The transformation that is used to alter the size of an object is called :

(a) Scaling

(b) Reflection

(c) Rotation

(d) Translation

12. For reducing the size of the object we set both scale factor :

(a) Less than 0

(b) Greater than 1

(c) Equals to 1

(d) In between 0 and 1

13. For uniform scaling:

(a) $S_x = S_y$

(b) $S_x > S_y$

(c) $S_x < S_y$

(d) $S_x != S_y$

14. In which transformation, the shape of an object can be modified in any direction depending upon the value assigned to them?

(a) Reflection

(b) Shearing

(c) Translation

(d) Rotation

15. _____refers to the result obtained by multiplying the matrix of the individual transformation representation sequences.

(a) Wireframe model

(b) Constructive solid geometry methods

(c) Composite transformation

(d) None of these

16. Sometimes it may require undoing the applied transformation, In such a case which of the following will be used?

(a) Shear

(b) Translation

(c) Reflection

(d) Inverse transformation

17. How many homogenous representations are possible for one point (x, y)?

(a) 1

(b) 0

(c) 2

(d) Infinite

18. After applying 2D shearing transformation in x-direction unit square becomes :

(a) Parallelogram

(b) Parabola

(c) Rectangle

(d) Hyperbola

19. Which are correct coordinates after applying shear in y-direction relative to line x=-1 with shear parameter 0.5 on the unit square?

(a) [(0, 1), (1, 1), (1, 0), (0, 0)]

(b) [(1.5, 1), (0.5, 1), (1, 1), (2, 2)]

(c) [(1.5, 1.5), (0.5, 1.5), (0, 1), (1, 2)]

(d) [(0, 0.5), (1, 1), (1, 2), (0, 1.5)]

20. The process of positioning an object along a straight line path from one coordinate point to another is called -

(a) Translation

(b) Reflection

(c) Shearing

(d) Transformation

21. Which of the following equation is used in 2D translation to move a point(x,y) to the new point (x',y')?

(a) x' = x + ty and y' = y + tx

(b) x' = x - tx and y' = y - ty

(c) x' = x + tx and y' = y + ty

(d) x' = x + tx and y' = y – ty

22. Which of the following is must be specified to generate a rotation?

(a) Rotational distance

(b) Rotation angle

(c) Co-ordinates

(d) None of the above

23. A positive value of the rotation angle -

(a) rotates an object in the clockwise direction

(b) rotates an object in the counter-clockwise direction

(c) Both of the above

(d) None of the above

24. What happens if the values of scaling factors sx and sy less than 1 (i.e., sx<1 and sy<1)?

(a) No change in the object's size

(b) Reduce the object's size

(c) Increase the object's size

(d) None of the above

25. The two-dimensional translation equation in the matrix form is

(a) P'=P+T

(b) P'=P-T

(c) P'=P*T

(d) P'=p

26. _____ is a rigid body transformation that moves objects without deformation.

(a) Rotation

(b) Scaling

(c) Translation

(d) All of the mentioned

27. Polygons are translated by adding _____ to the coordinate position of each vertex and the current attribute setting.

(a) Straight line path

(b) Translation vector

(c) Differences

(d) Only b

28. To change the position of a circle or ellipse we translate

(a) Center coordinates

(b) Center coordinates and redraw the figure in new location

(c) Outline coordinates

(d) All of the mentioned

29. The basic geometric transformations are

(a) Translation

(b) Rotation

(c) Scaling

(d) All of the mentioned

30. The rotation axis that is perpendicular to the xy plane and passes through the pivot point is known as

(a) Rotation

(b) Translation

(c) Scaling

(d) Shearing

31. The two-dimensional rotation equation in the matrix form is

(a) P'=P+T

(b) P'=R*P

(c) P'=P*P

(d) P'=R+P

32. An ellipse can also be rotated about its center coordinates by rotating

(a) End points

(b) Major and minor axes

(c) Only a

(d) None

33. The two-dimensional scaling equation in the matrix form is

(a) P'=P+T

(b) P'=S*P

(c) P'=P*R

(d) P'=R+S

34. Scaling of a polygon is done by computing

(a) The product of (x, y) of each vertex

(b) (x, y) of end points

(c) Center coordinates

(d) Only a

35. If the scaling factors values sx and sy are assigned to unequal values then

(a) Uniform rotation is produced

(b) Uniform scaling is produced

(c) Differential scaling is produced

(d) Scaling cannot be done

36. The objects transformed using the equation P'=S*P should be

(a) Scaled

(b) Repositioned

(c) Both a and b

(d) Neither a nor b

37. We control the location of a scaled object by choosing the position is known as

(a) Pivot point

(b) Fixed point

(c) Differential scaling

(d) Uniform scaling

38. If the value of sx=1 and sy=1 then

(a) Reduce the size of object

(b) Distort the picture

(c) Produce an enlargement

(d) No change in the size of an object

39. The matrix representation for translation in homogeneous coordinates is

(a) P'=T+P

(b) P'=S*P

(c) P'=R*P

(d) P'=T*P

40. The matrix representation for scaling in homogeneous coordinates is

(a) P'=S*P

(b) P'=R*P

(c) P'=dx+dy

(d) P'=S*S

41. The matrix representation for rotation in homogeneous coordinates is

(a) P'=T+P

(b) P'=S*P

(c) P'=R*P

(d) P'=dx+dy

42. What is the use of homogeneous coordinates and matrix representation?

(a) To treat all 3 transformations in a consistent way

(b) To scale

(c) To rotate

(d) To shear the object

43. If point are expressed in homogeneous coordinates then the pair of (x, y) is represented as

(a) (x', y', z')

(b) (x, y, z)

(c) (x', y', w')

(d) (x', y', w)

44. For 2D transformation the value of third coordinate i.e. w=?

(a) 1

(b) 0

(c) -1

(d) Any value

45. We can combine the multiplicative and translational terms for 2D into a single matrix representation by expanding

(a) 2 by 2 matrix into 4*4 matrix

(b) 2 by 2 matrix into 3*3

(c) 3 by 3 matrix into 2 by 2

(d) Only c

46. The general homogeneous coordinate representation can also be written as

(a) (h.x, h.y, h.z)

(b) (h.x, h.y, h)

(c) (x, y, h.z)

(d) (x,y,z)

47. Two successive translations are_____

(a) Multiplicative

(b) Inverse

(c) Subtractive

(d) Additive

48. General pivot point rotation can be expressed as _____

(a) T(zr,yr).R(θ).T(-zr,-yr) = R(xr,yr,θ)

(b) T(xr,yr).R(θ).T(-xr,-yr) = R(xr,yr,θ)

(c) T(xr,yr).R(θ).T(-xr,-yr) = R(zr,yr,θ)

(d) T(xr,yr).R(θ).T(-xr,-yr) = R(xr,yr,Q)

49. Which transformation distorts the shape of an object such that the transformed shape appears as if the object were composed of internal layers that had been caused to slide over each other?

(a) Rotation

(b) Scaling up

(c) Scaling down

(d) Shearing

50. In a rotation, by how much angle is the object rotated?

(a) 45 degree

(b) 90 degree

(c) 180 degree

(d) 360 degree

51. If two pure reflections about a line passing through the origin are applied successively the result is _____

(a) Pure rotation

(b) Quarter rotation

(c) Half rotation

(d) True reflection

52. Which of the following is NOT true?

Image formed by reflection through a plane mirror is_____

(a) of same size

(b) same orientation

(c) virtual

(d) is at same distance from the mirror

53. Shearing is also termed as _____

(a) Selecting

(b) Sorting

(c) Scaling

(d) Skewing

54. Which of this is compulsory for 2D reflection?

(a) Reflection plane.

(b) Origin

(c) Reflection axis

(d) Co-ordinate axis.

55. A _____ is a system which uses one or more numbers, or coordinates, to uniquely determine the position of a point.

(a) co-ordinate system

(b) binary-system

(c) vector-system

(d) euclid geometry

56. Which of the co-ordinate represents Z co-ordinate in (6,8,9)?

(a) 6

(b) 8

(c) 9

(d) 0

57. A three-dimensional object can be represented using which of the following representation?

(a) Equation

(b) Function

(c) Point

(d) Polygon

58. Which of the following equation correctly represent a 3 D plane?

(a) Ax + By + Cz = 1

(b) Ax + By + Cz = 0

(c) Ax + By + Cz + D = 1

(d) Ax + By + Cz + D = 0

59. Which of the following transformations are most common that are applied on three-dimensional objects?

(a) Translation

(b) Scaling

(c) Rotation

(d) Translation, Scaling, Rotation

60. How many axes does a three-dimensional graphics consists of?

(a) One axis

(b) Two axes

(c) Three axes

(d) Six axes

61. Which of the following operation can be applied on a 3 D object to move it along any axis from its original position?

(a) Translation

(b) Scaling

(c) Rotation

(d) Shearing

62. If the original point P = (5, 7, 3) and the translation factor, T = (-2, -1, 3), then what will be the value of the final point P1?

(a) P1 = (7, 8, 6)

(b) P1 = (3, 6, 0)

(c) P1 = (7, 8, 0)

(d) P1 = (3, 6, 6)

63. How many different types of translation are present in computer graphics?

(a) 1

(b) 2

(c) 3

(d) 4

Note: point, line and polygon translation

64. Which of the following operation can be applied on a 3 D object to zoom it in or out about any axis from its original position?

(a) Translation

(b) Scaling

(c) Rotation

(d) Shearing

65. The positive value of the pivot point rotates an object in which of the following position?

(a) Clockwise

(b) Anti-Clockwise

(c) Both Clockwise and Anti-Clockwise

(d) Neither Clockwise nor Anti-Clockwise

66. Which of the following equation is correct for the new Y co-ordinate if an object undergoes 3D rotation around x axis?

(a) Ynew = Yold x cosθ – Zold x sinθ

(b) Ynew = Yold x sinθ – Zold x cosθ

(c) Ynew = Yold x cosθ + Zold x sinθ

(d) Ynew = Yold x sinθ + Zold x cosθ

67. Which of the following equation is correct for the new X co-ordinate if an object undergoes 3D rotation around y axis?

(a) Xnew = Zold x cosθ – Xold x sinθ

(b) Xnew = Zold x cosθ + Xold x sinθ

(c) Xnew = Zold x sinθ – Xold x cosθ

(d) Xnew = Zold x sinθ + Xold x cosθ

68. What will be the final coordinates after rotation of the point P(5, 5, 5) at 90° about Z-axis?

(a) (5, -5, -5)

(b) (-5, -5, -5)

(c) (-5, 5, 5)

(d) (5, -5, 5)

69. What will be the final coordinates after rotation of the point P(2, 3, 7) at 90° about X-axis?

(a) (2, -7, -3)

(b) (-2, -7, -3)

(c) (-2, 7, 3)

(d) (2, -7, 3)

70. Which of the following transformation is a rotation where angle of rotation is 180°?

(a) Rotation

(b) Shearing

(c) Reflection

(d) Translation

71. How many types of reflection is possible in a 3-dimensional environment?

(a) 1

(b) 3

(c) 6

(d) 9

72. Which of the following transformation can be used to change the shape of a 3D object in any particular axis?

(a) Scaling

(b) Rotation

(c) Shearing

(d) Translation

73. What does composite transformations means?

(a) Transformations that can be done in sequence

(b) Transformations that cannot be done in sequence

(c) Transformations that can be done simultaneously

(d) Transformations that cannot be done simultaneously

74. In terms of a line, which of the following means fixed point scaling?

(a) Both endpoints of the line remains same even after scale

(b) Both endpoints of the line changes after scaling

(c) One endpoint of the line remains same after scaling

(d) The line can be scaled only till a fixed point

75. What should be sequence of transformations that are required to perform rotation of an object around an arbitrary point?

(a) Inverse Translation, Rotation, Translation

(b) Scaling, Translation, Rotation

(c) Translation, Rotation, Inverse Translation

(d) Rotation, Translation, Scaling

76. Which of the following process is analogous to creating a view of a three dimensional scene?

(a) Making a painting

(b) Taking a photograph

(c) Recording a sound

(d) Editing a picture

77. What are the final coordinates after a translation of point P (10, 10, 10) into 3D space with translation factor T (10, 20, 5)?

(a) (20, 30, 15)

(b) (20, 20, 25)

(c) (15, 30, 25)

(d) (15, 20, 25)

78. Arrange transformation sequence of 3D viewing pipeline in a correct order :

1. Viewing Transformation

2. Workstation Transformation

3. Modeling Transformation

4. Projection Transformation

(a) 1, 2, 3, 4

(b) 1, 3, 4, 2

(c) 3, 1, 2, 4

(d) 3, 1, 4, 2