Examination: SE   Semester III

Course Code: CSC305 and Course Name: Computer Graphics

Time: 2-hour   Max. Marks: 80

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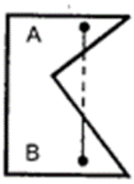
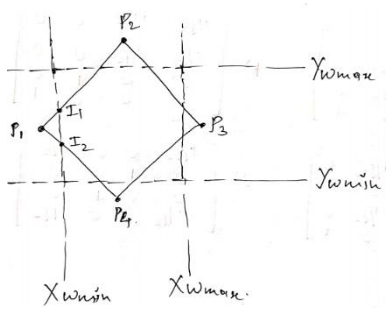
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	In Liang–Barsky algorithm, when pk < 0, then the line is ____________.
Option A:	parallel to the boundaries
Option B:	exceeding the boundaries
Option C:	bounded inside the boundaries
Option D:	bounded outside the boundaries
2.	The given polygon is _______ 
Option A:	concave polygon
Option B:	convex polygon
Option C:	not convex not concave
Option D:	trapezoid
3.	To model water, clouds, and terrain, ____________ fractals are commonly used.
Option A:	self-similar
Option B:	self-affine
Option C:	invariant
Option D:	variant
4.	In 3D transformation if the object is rotated counterclockwise 45^0 about x-axis, what will be the rotation matrix? a) $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1/\sqrt{2} & 1/\sqrt{2} & 0 \\ 0 & -1/\sqrt{2} & 1/\sqrt{2} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$ b) $\begin{bmatrix} 1/\sqrt{2} & 1/\sqrt{2} & 0 & 0 \\ -1/\sqrt{2} & 1/\sqrt{2} & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$ c) $\begin{bmatrix} 1/\sqrt{2} & 0 & +1/\sqrt{2} & 0 \\ 0 & 1 & 0 & 0 \\ -1/\sqrt{2} & 0 & 1/\sqrt{2} & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$ d) $\begin{bmatrix} 1/\sqrt{2} & 0 & 0 & 1/\sqrt{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ -1/\sqrt{2} & 0 & 0 & 1/\sqrt{2} \end{bmatrix}$
Option A:	a
Option B:	b
Option C:	c
Option D:	d
5.	___________, is not an advantage of Direct View Storage Tubes.

Option A:	Refreshing of CRT is not required
Option B:	Very complex pictures can be displayed at very high resolution without flicker
Option C:	It has a flat screen
Option D:	Selective or part erasing of screen is not possible
6.	If we construct the Bezier curve of order 3 and with 4 polygon vertices A (2, 2), B (3,3), C (4,4), D (5,5) from its equation P(u) and consider u = 0, 1/4, 1/2, 3/4, then P (1/4) is ________.
Option A:	(4.75, 4.75)
Option B:	(3.75, 3.75)
Option C:	(2.75, 2.75)
Option D:	(1.75, 1.75)
7.	In 3D-clipping, if we assign the bit positions in the region code from right to left as B6 B5 B4 B3 B2 B1, then a region code of ____________ identifies a point as above and behind the view volume.
Option A:	010000
Option B:	011000
Option C:	100010
Option D:	101000
8.	What is the effect of weighted area sampling on adjacent pixels?
Option A:	Intensity is increased
Option B:	Intensity is decreased
Option C:	Contrast is increased
Option D:	Contrast is decreased
9.	Line AB with A (2, 2) and B (12,9). In Cohen-Sutherland line clipping ______ & ______ are the region codes (B4 B3 B2 B1) for A and B.
Option A:	0000, 0101
Option B:	1010, 0000
Option C:	1010, 0101
Option D:	0101, 1010
10.	What is the disadvantage of the light pen?
Option A:	Shape
Option B:	They cannot detect positions
Option C:	Accurate reading
Option D:	Cannot detect positions within black areas
11.	We control the location of a scaled object by choosing the position is known as __.
Option A:	Pivot point
Option B:	Fixed point
Option C:	Differential scaling
Option D:	Uniform scaling
12.	Any convenient co-ordinate system or Cartesian co-ordinates which can be used to define the picture is called____________. ____________
Option A:	spherical co-ordinates

Option B:	vector co-ordinates
Option C:	viewport co-ordinates
Option D:	world co-ordinates
13.	If two pure reflections about a line passing through the origin are applied successively the result is ____________________.
Option A:	Pure rotation
Option B:	Quarter rotation
Option C:	Half rotation
Option D:	True reflection
14.	 . For a given polygon and clipping window shown, ________is the list of vertices after left boundary clipping in Sutherland-Hodgeman algorithm.
Option A:	I1, P2, P3, P4, I2
Option B:	P1, I1, P3, P4, I2
Option C:	I1, P2, P3, P4
Option D:	I1, P2, P4, I2
15.	If the scaling factors values sx and sy are assigned to unequal values, then _______.
Option A:	Uniform rotation is produced
Option B:	Uniform scaling is produced
Option C:	Differential scaling is produced
Option D:	Scaling cannot be done
16.	The Z-buffer algorithm is usually implemented in the __________, so that z-values range from 0 at the black clipping plane to 1 at the front clipping plane.
Option A:	world coordinates
Option B:	normalized coordinates
Option C:	physical coordinates
Option D:	viewing coordinates
17.	The two-dimensional scaling equation in the matrix form is
Option A:	P’=P+T
Option B:	P’=S*P
Option C:	P’=P*R
Option D:	P’=R+S
18.	In Koch curve repetition increases the length of the curve by __________.

Option A:	factor 3/4
Option B:	factor 3/5
Option C:	factor 4/5
Option D:	factor 4/3
19.	In Bezier curve, the degree of the polynomial defining the curve segment is ___ less than the number of defining polygon point.
Option A:	one
Option B:	two
Option C:	three
Option D:	four
20.	The transformation matrix for the appropriate 2D transformation which reflects a figure in point (0.5, 0.5) can be given as ___________. A) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 1 & 0 & 1 \end{bmatrix}$ B) $\begin{bmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 1 & 0 \end{bmatrix}$ C) $\begin{bmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 1 & 1 & 1 \end{bmatrix}$ D) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 1 & 1 & 1 \end{bmatrix}$
Option A:	A
Option B:	B
Option C:	C
Option D:	D

Q2	Solve any Two Questions out of Three **10 mark each**
A	Derive midpoint-circle drawing algorithm, using the same, plot the circle whose radius is 10 units and center is (2,2).
B	Explain scan line polygon fill algorithm with suitable example.
C	Use Liang-Barsky line clipping algorithm to clip the line segment AB against the window. Line coordinates are A(1, 7), B(9, 8) and lower left corner of the window is (1, 2) and upper right corner is (7, 6).

Q3	
A	**Solve any Two** **5 mark each**
i.	Compare boundary-fill and flood-fill algorithm.
ii.	Prove that 2D rotation and scaling commute if $S_x = S_y$.
iii.	What is the purpose of inside-outside/ even-odd test? Explain with example.
B	**Solve any One** **10 mark each**
i.	Explain the Z-buffer algorithm for hidden surface removal
ii.	Find the clipping coordinates to clip the line segment AB against the window using Cohen-Sutherland line clipping algorithm. Given A (30, 40), B (80, 90) and $(X_{wmin}, Y_{wmin}) = (50, 20)$, $(X_{wmax}, Y_{wmax}) = (90, 50)$.