University of Mumbai
Examination 2020 under cluster __ (Lead College: _____)
Examinations Commencing from 15th June to 26th June 2021
Program: **Computer Engineering**
Curriculum Scheme: Rev2019
Examination: SE Semester III(for Direct Second Year-DSE)
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.	What is not included in computer graphics
Option A:	A single image stored on computer
Option B:	Multiple images stored on computer
Option C:	A video file stored on computer
Option D:	An audio file stored on computer
2.	In DDA line drawing method, for lines having positive slope greater than 1 and taking right end point as starting point, the X and Y coordinate increments are
Option A:	1 and m
Option B:	1/m and 1
Option C:	-1/m and -1
Option D:	-1 and –m
3.	Which of the following line drawing method uses swapping of two terms I) DDA line method II) II)Bresenham's line method
Option A:	Only I
Option B:	Only II
Option C:	Both I and II
Option D:	Neither I nor II
4.	Due to aliasing effect the line appears
Option A:	Straight
Option B:	Curved
Option C:	Zigzag
Option D:	Clipped
5.	In ellipse, at the boundary of region 1 and region 2, the slope of tangent is
Option A:	-1
Option B:	1
Option C:	0
Option D:	∞
6.	What is the last point computed in quadrant 1 on the circumference of an ellipse centered at (10,10) with Rx = 10 and Ry = 20, using midpoint ellipse method

Option A:	(10,0)
Option B:	(20,0)
Option C:	(10,20)
Option D:	(20,10)

7.	Which of the following transformations when performed in succession are additive in nature
	    I) Translation
	    II) Rotation
	    III) Scaling

Option A:	I and II
Option B:	II and III
Option C:	I and III
Option D:	I, II and III
8.	Transformation used for zooming in computer graphics is
Option A:	Translation
Option B:	Rotation
Option C:	Scaling
Option D:	Reflection

9.	In window to viewport mapping, which of the following transformations are used
	    I) Translation
	    II) Rotation
	    III) Scaling

Option A:	I, II and III
Option B:	1 and II
Option C:	II and III
Option D:	I and III
10.	All the points, lines, polygons that are clipped are mapped onto _____ for display.
Option A:	Window
Option B:	Viewport
Option C:	Display area
Option D:	Clipping window
11.	The coordinates of clipping window are (4,4) and (9,8). The region code of point (12,9) is
Option A:	0010
Option B:	1010
Option C:	1000
Option D:	0100
12.	In Liang Barsky line clipping method, the parameter p for left boundary is
Option A:	$-(x_2 - x_1)$
Option B:	$(x_2 - x_1)$

Option C:	-$(y_2 - y_1)$
Option D:	$(y_2 - y_1)$
13.	3D reflection matrix are given about
Option A:	One principle plane
Option B:	Two principle plane
Option C:	Three principle plane
Option D:	Four principle plane
14.	Inverse translation produces the translation in the
Option A:	Same direction
Option B:	Direction of -X axis
Option C:	Direction of -Y axis
Option D:	Opposite direction
15.	Following matrix represents $$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & \cos\theta & \sin\theta & 0 \\ 0 & -\sin\theta & \cos\theta & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$
Option A:	3D reflection about Y axis
Option B:	3D rotation about Y axis
Option C:	3D rotation about X axis
Option D:	3D reflection about X axis
16.	As the number of pixels on the screen is increased, it improves
Option A:	Aspect ratio
Option B:	Image size
Option C:	Resolution
Option D:	Window size
17.	Any line that has 1 in the same bit position, in the region codes of each end point is
Option A:	Completely inside
Option B:	Completely outside
Option C:	Partially inside
Option D:	Cannot comment on visibility of line
18.	When scaling transformation with $S_x = 2$ and $S_y = 2$ is applied to a point, then there is a change in its
Option A:	Shape
Option B:	Size
Option C:	Position
Option D:	Orientation
19.	In depth buffer method, when z < depth of (x,y) then z value is
Option A:	stored in visible buffer
Option B:	Stored in depth buffer
Option C:	Stored in refresh buffer

Option D:	Stored in intensity buffer
20.	Image space methods deal with
Option A:	Pixels
Option B:	Lines
Option C:	Surfaces
Option D:	Curves

Q2	
A	**Solve any Two** **5 marks each**
i.	Define computer graphics and give its application areas.
ii.	Define animation and discuss traditional animation techniques
iii.	Explain homogeneous coordinates in computer graphics
B	**Solve any One** **10 marks each**
i.	Derive the mid point ellipse drawing algorithm
ii.	Find the clipping coordinates to clip the line segment AB against the window using Liang Barsky line clipping algorithm. A(20,50) B(80,110) $X_{wmin} = 40$ $Y_{wmin} = 40$ $X_{wmax} = 100$ $Y_{wmax} = 90$

Q3	
A	**Solve any Two** **5 marks each**
i.	What is aliasing effect? Discuss any one antialiasing technique.
ii.	Explain with suitable diagram window to viewport transformation
iii.	A rectangle ABCD with coordinates A(2,2), B(4,2), C(4,4) and D(2,4). Translate the given rectangle 20 units in X direction and 10 units in Y direction. Calculate the new co-ordinates of rectangle ABCD.
B	**Solve any One** **10 marks each**
i.	Calculate pixel positions along a straight line between A(20,20) and B(10,12) using Bresenham's line drawing method
ii.	Explain Z buffer algorithm with suitable diagram

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	D
Q2.	C
Q3.	B
Q4	C
Q5	A
Q6	D
Q7	A
Q8.	C
Q9.	D
Q10.	B
Q11.	B
Q12.	A
Q13.	C
Q14.	D
Q15.	C
Q16.	C
Q17.	B
Q18.	C
Q19.	B
Q20.	A

Q2 B ii $\Delta x = 60$ and $\Delta y = 60$ 10
U1 = 1/3 and U2 = 2/3
End points of line after clipping are A(40,70) and B(60,90)
Iteration corresponding to each boundary must show formula and values computation

Q3 A iii   New coordinates are : A(22,12), B(24,12), C(24,14) and D(22,14).   5
Translation matrix using homogeneous coordinates is expected

Q3 B i $\Delta x = 10$ $\Delta y = 8$ 10
Points plotted are (20,20), (19,19), (18,18), (17,18), (16,17), (15,16), (14,15), (13,14), (12,14), (11,13), (10,12)
At each iteration decision parameter formula and value computation is expected.