PAPER ID-311201

Roll No: | | | | | | | | | | | | | |

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BTECH
(SEM V) THEORY EXAMINATION 2024-25
COMPUTER GRAPHICS

TIME: 3 HRS **M.MARKS: 70**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 07 = 14**

Q no.	Question	CO	Level
a.	What are the limitations of the DDA algorithm?	CO2	K2
b.	What are the applications of computer graphics?	CO1	K2
c.	What is the role of homogeneous coordinates in computer graphics?	CO2	K2
d.	What do you mean by windowing and clipping?	CO3	K2
e.	What is various 3D viewing parameters?	CO4	K2
f.	What do you understand by Blobby Objects?	CO5	K2
g.	What are the advantages of the z-buffer algorithm?	CO5	K2

SECTION B

2. Attempt any *three* of the following: **07 x 3 = 07**

Q no.	Question	CO	Level
a.	What is the significance of resolution and refresh rate in raster scan displays?	CO2	K2
b.	What are the challenges and solutions when clipping lines against non-rectangular clip windows?	CO3	K2
c.	Explain the advantages and disadvantages of wireframe models.	CO4	K2
d.	What are the parametric representations of quadric surfaces? Define mathematically in computer graphics.	CO4	K2
e.	What is diffused reflection? Give the illumination model that incorporate this reflection.	CO5	K2

SECTION C

3. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a.	Explain Bresenham's circle algorithm and plot a pixel position for a circle whose center is (-3,8) and radius 12 unit using midpoint circle algorithm.	CO2	K3
b.	What considerations must be taken into account to ensure consistency and accuracy when implementing parallel algorithms for graphics?	CO5	K2

4. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a.	Find the transformed coordinates of a triangle having vertices A (4, 1), B(7, 1) and C (7, 3) subjected to reflection through the line $2y = x$.	CO3	K3
b.	What are the advantages and limitations of the Cohen-Sutherland line clipping algorithm?	CO3	K2

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5. Attempt any *one* part of the following: 07 x 1 = 07

Q no.	Question	CO	Level
a.	What are 3-D geometric primitives, and how do they form the building blocks of 3D models?	CO2	K2
b.	Find the transformed coordinates of position vector (3, 2, 4, 4) when translated along the coordinate axes by -1, -2, -3, respectively followed by 45° ccw rotation about the x-axis on the homogeneous coordinate position vector.	CO3	K3

6. Attempt any *one* part of the following: 07 x 1 = 07

Q no.	Question	CO	Level
a.	What are the properties associated with curves? Explain the mathematical representation for B-spline curves.	CO5	K2
b.	The four control points in two-dimensional plane are P_0 (0, 0), P_1 (1, 1), P_2 (2, -1) and P_3 (3, 0). The tangent vectors at the endpoints are P_0' (1, 1) and P_3' (1, 1). Determine the intermediate points on the Hermite curve at $t = \frac{1}{3}, \frac{2}{3}$.	CO5	K3

7. Attempt any *one* part of the following: 07 x 1 = 07

Q no.	Question	CO	Level
a.	Differentiate between image space and object space. Explain painters algorithm for hidden surface removal.	CO5	K2
b.	What is the principle behind the Back Face Detection algorithm? Explain in brief.	CO5	K2

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