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Roll No. .....

TBC–601/TBI–602

B. C. A./B. SC. (IT)

(SIXTH SEMESTER) MID SEMESTER EXAMINATION, April, 2023

COMPUTER GRAPHICS

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any ***one*** of the sub-questions.

(ii) Each sub-question carries 10 marks.

1. (a) (i) Consider two matrices A and B :

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} \text{ and } B = \begin{bmatrix} 6 & 3 \\ 5 & 2 \\ 4 & 1 \end{bmatrix}$$

Find A × B.

(ii) Prove that matrix multiplication is non-commutative. (CO2)

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OR

(b) (i) Write an algorithm to check if a point lies on a line or not.

(ii) Does (3, –2) lie on the line with equation $5x - 2y = 20$? (CO2)

2. (a) What is frame buffer ? How long would it take to load a 640 by 480 frame buffer with 12 bits per pixel if transfer rate is 1Mbps ? What is the size of frame buffer ? How many colors does it support ? (CO2)

OR

(b) Explain Bresenham circle drawing algorithm. Why is circle divided in octants in circle drawing algorithms ? (CO3)

3. (a) Digitize the pixel points using bresenham line drawing algorithm for a line segment A(10, 12), B(21, 24). (CO3)

OR

(b) Consider two raster systems with the resolutions of 640 × 480, 1280 × 1024. What size frame buffer (in KB) is needed for each of these systems to store 12 bits/pixel for 10 seconds video of 30 frame per second. (CO1)

4. (a) Derive DDA line algorithm. What are the limitations of DDA algorithm ? (CO3)

OR

(b) Explain the working of CRT with a diagram. What were the limitations of CRT ? (CO1)

5. (a) Write short notes on the following : (CO1)

(i) AMOLED

(ii) CMYK color model

(iii) 4K resolution

OR

(b) Explain the difference between : (CO1)

(i) Raster scan *vs.* Random scan

(ii) horizontal retrace *vs.* Vertical retrace

(iii) Shadow mask *vs.* Beam penetration technique