

# Thapar Institute of Engineering and Technology

Computer Science and Engineering Department

Written Test

BE-MBA (Third Year): Semester V (2021/22)

Date: 26<sup>th</sup> October 2021

Time: 2 Hours

M. Marks: 45

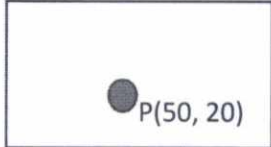
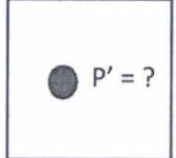
Course Code: UCS505

Course Name: Computer Graphics

Day/Time: Tuesday/10:00 am

Instructor: Dr. Sangita Roy

- Attempt any five questions
- Assume missing data, if any, suitably

Q1.	<p>(a) What is the advantage of Polar Coordinate System over Cartesian Coordinate System? Explain with Example. (5)</p> <p>(b) Demonstrate the Distributive and the Associative properties of the matrix multiplication using following matrices: (4)</p> $A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \quad B = \begin{pmatrix} 2 & 0 & -1 \\ 3 & 5 & 1 \end{pmatrix} \quad C = \begin{pmatrix} 0 & 2 \\ 1 & 4 \\ -2 & -1 \end{pmatrix}$
Q2.	What is the difference between Bitmap and Pixmap? Write down the working principle of CRT. (1+8)
Q3.	Write down the pros and cons of Direct Scan Conversion, DDA and Bresenham's line drawing algorithms. Calculate the intermediate points between pixels A(2, 3) and B(12, 8) using Bresenham's line drawing algorithm. (Clearly show all the calculations) (3+6)
Q4.	<p>Perform a 45° rotation of triangle A(0, 0), B(1, 1), C(5, 2) (4.5+4.5)</p> <p>(a) About point P(-2, -2) and</p> <p>(b) About the origin</p>
Q5.	<p>Let R be the rectangular window whose lower left-hand corner is at X(-3, 1) and upper right-hand corner is at T(2, 6). Find the region codes for the following endpoints: (9)</p> <p>A(-4, 2), B(-1, 7), C(-1, 5), D(3, 8), E(-2, 3), F(1, 2), G(1, -2), H(3, 3), I(-4, 7)</p>
Q6.	<p>Given a triangle with points (1,1), (0,0) and (1,0). (9)</p> <p>Find out the new coordinates of the object along</p> <p>X-axis, Y-axis, XY-axis.</p> <p>(Applying shear parameter 4 on X-axis and 1 on Y-axis.)</p>
Q7.	<p>(a) Find the form of the matrix for reflection about a line L with slope m and y intercept (0, b) (4)</p> <p>(b) Calculate the coordinate of P' in viewport window: (5)</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <p>(0, 100)</p>  <p>P(50, 20)</p> <p>(0, 0) (100, 0)</p> </div> <div style="text-align: center;"> <p>(20, 50)</p>  <p>P' = ?</p> <p>(20, 20) (40, 20)</p> </div> </div>