WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2022

CMSACOR14T-COMPUTER SCIENCE (CC14)

Time Allotted: 2 Hours   Full Marks: 40

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.

GROUP-A

1.   Answer any *four* questions from the following: 2×4 = 8

   (a) "Computer graphics is an integral part of designing a video game."– Do you agree? Justify your answer.

   (b) Explain 8-way symmetry of a circle.

   (c) Explain RGB color model.

   (d) Define horizontal as well as vertical retracing.

   (e) What are the applications of computer graphics?

   (f) What is vanishing point?

   (g) What is a pixel?

GROUP-B

Answer any *four* questions from the following   8×4 = 32

2. (a) Explain in detail about DDA line drawing algorithm.   4+1+3

   (b) What do you mean by staircase effects?

   (c) Explain working procedure of Refresh Cathode-Ray Tubes.

3. (a) What are the differences between raster scan display and random scan display?   3+3+2

   (b) What is the relationship between RGB and CMYK colour model?

   (c) What is interlacing?

4. (a) Let *R* be the rectangular window whose lower-left corner is at *L*(–3, 1) and upper right corner is at *R*(2, 6). Use the Cohen–Sutherland algorithm to clip the segments of a line for which one end point is at *A*(–4, 2) and another is at   4+4

   B(–1, 7).

(b) For the above-mentioned rectangular window clip the segments of a line for which one end point is at $C(-1, 5)$ and another is at $D(3, 8)$ by using midpoint subdivision process.

5. (a) Find the matrix that represents rotation of an object by 30° about the origin.   2+(3+3)

    (b) Perform a 45° rotation of triangle $A(0, 0)$, $B(1, 1)$, $C(5, 2)$ about the origin and about the point $P(-1, -1)$.

6. (a) Explain Window-to-Viewport mapping with a figure.

    (b) Compare between point clipping and line clipping.

7. (a) Discuss in detail about Midpoint Circle drawing algorithm.   4+2+2

    (b) Differentiate between Flood Fill and Boundary Fill algorithms.

    (c) Define Virtual Reality.

8. (a) Prove that two successive $2D$ rotations are additive: 2+2+4

$$R(\Theta_1) \cdot R(\Theta_2) = R(\Theta_1 + \Theta_2).$$

    (b) Suppose that the base of the window is rotated at an angle Θ from the x-axis. What is the window-to-viewport mapping?

    (c) Find the form of the matrix for reflection about a line L with slope m and y intercept $(0, b)$.

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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