WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 6th Semester Examination, 2021

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.
All symbols are of usual significance.

GROUP-A

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

   (a) What is reflection transformation?

   (b) Define pixel and resolution.

   (c) Calculate the memory size required for a frame buffer to store an 8-bit color image for a monitor having 1280×1024 resolution.

   (d) Distinguish between random scan and raster scan display system.

   (e) What do you mean by text clipping?

   (f) State two application areas of computer graphics.

GROUP-B

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

2. (a) Write down Bresenham's line drawing algorithm for $|m| < 1$.   4

   (b) Discuss its advantages over DDA.   2

   (c) What are the applications of computer graphics?   2

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

   (b) Describe the RGB color model.   4

   (c) What do you mean by an aspect ratio?   1

4. (a) What is homogeneous coordinate system?   2

   (b) Perform a 30° rotation of a triangle $A(2, 2)$, $B(3, 3)$, $C(6, 5)$ about   2+3

      (i) the origin

      (ii) a point $P(-8, -5)$.

   (c) What do you mean by shearing?   1

5. (a) Explain Sutherland-Hodgeman Polygon clipping algorithm. 4

   (b) Write boundary-fill algorithm for region filling. 2

   (c) Differentiate between Flood Fill and Boundary Fill algorithms. 2

6. (a) Prove that two scaling transformations are commutative, i.e., $S_1 S_2 = S_2 S_1$. 2

   (b) Define rotation in 2D-transformation. 2

   (c) Using Midpoint circle generation algorithm, finds out the pixels in the first quadrant of a circle having radius 10 units and centre at (0, 10). 4

7. (a) Use the Cohen Sutherland line clipping algorithm to clip the following lines against a window A (50, 10), B (80, 10), C (80, 40) and D (50, 40). 3+3
      (i) P1 (40, 15) and P2 (75, 45)
      (ii) P3 (70, 20) and P4 (100, 10).

   (b) Distinguish between window and viewport. 2

   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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