

DiplETE – CS

Time: 3 Hours

DECEMBER - 2014

Max. Marks: 100

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.
- The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.
- Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated.

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. Which of the following is not an input device:

- | | |
|--------------|-------------|
| (A) Mouse | (B) Plotter |
| (C) Joystick | (D) Scanner |

b. A straight line can always be drawn connecting

- | | |
|-----------------|------------------|
| (A) Two points | (B) Three points |
| (C) Four points | (D) Five points |

c. Bresenham's algorithm is used to

- | | |
|------------------|-------------------|
| (A) Draw a line | (B) Draw a circle |
| (C) Both A and B | (D) B only |

d. A point in two dimensional planes is represented using homogeneous coordinate system as

- | | |
|---------------|-------------------|
| (A) (x, y, 1) | (B) (x, y, 0) |
| (C) (x, y, w) | (D) (x/w, y/w, 1) |

e. Projection cannot be

- | | |
|-----------------|-------------------|
| (A) Parallel | (B) Perspective |
| (C) Axonometric | (D) Approxometric |

f. How many basic rotation matrices do we consider in 3D transformation?

- | | |
|-------|-------|
| (A) 1 | (B) 5 |
| (C) 4 | (D) 3 |

Code: DC66

Subject: COMPUTER GRAPHICS

- g. Which of the following is not a rigid body transformation?
- (A) Shear along X-axis (B) Shear along Y-axis
(C) Shear along XY- axis (D) Reflexion about line $x = y$
- h. A Bezier curve can have N control points, where
- (A) N is always 4 (B) $N > 4$
(C) $N < 4$ (D) Minimum value of N is 1.
- i. Which of the following clipping algorithm uses out-codes for clipping of line?
- (A) Cohen -Sutherland (B) Cyrus-Beck
(C) Sutherland-Hodgeman (D) None of these
- j. Which of the following is NOT a component of Multimedia?
- (A) Polygon filling (B) Animation
(C) Sound (D) Video

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

- Q.2** a. Differentiate between non-interactive and interactive graphics. (8)
- b. Describe the display technology used in TFT screen. (8)
- Q.3** a. Why only $1/8^{\text{th}}$ of the total number of pixels on the circumference of a circle is required to be computed? Write an algorithm to draw a circle. (8)
- b. What is aliasing? Write a method to resolve the aliasing effect while printing a graphics on printer or drawing the graphics on screen. (8)
- Q.4** a. Write the 2D transformation matrices for three basic transformations: translation, rotation and scaling. (8)
- b. Compute the transformation matrix for reflecting a point (x, y) with respect to line $y = x$ and hence find the new coordinates for the point P(2, -4). (8)
- Q.5** a. What is Bezier Surface? How is it related to Bezier curve? (8)
- b. Briefly explain the concept of perspective projection and provide a situation showing three vanishing points. (8)
- Q.6** a. Find a transformation matrix for converting an image of size (W, H) = (300, 250) to display it on a viewport of size (W*, H*) = (200, 150). Lower left corner of the view port is at (200, 200). (8)
- b. Write the Cohen Sutherland line clipping algorithm. (8)

- Q.7** a. Write Z- Buffer algorithm for hidden surface removal. (8)
- b. Write an algorithm to remove hidden lines from the scene before drawing it on the display screen. (8)
- Q.8** a. Write any four video formats and explain any one of them. (8)
- b. What is real time animation and how is it produced? (8)
- Q.9** a. What are the various components of multimedia? How do they affect human perception and understanding? (8)
- b. What are the differences between BMP and PCX file format? (8)