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M. Tech 3rd Semester Examination

Computer Graphics

CSE1-631/MT-301

Time : 3 Hours   Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions. One question from each section ABCD. Section E is compulsory.

SECTION - A

Q1.   What is computer graphics? Explain various graphics input devices?   **(5+15)**

OR

Q2.   Differentiate between raster scan and random scan displays? Explain the working of a raster scan CRT?   **(8+12)**

SECTION - B

Q3.   Explain the various steps involved in Bresenham's line drawing algorithm?
Why is Bresenham's algorithm preferred over DDA algorithm? Indicate raster locations that would be chosen by Bresenham's algorithm while scan converting a line with end points (0,0) and (6,8)?   **(8+4+8)**

OR

Q4.   Write an algorithm for circle generation using mid-point algorithm? Indicate which raster locations would be chosen by mid-point circle generation algorithm to draw a circle of radius 5 and centre at (2,3)?   **(10+10)**

SECTION - C

Q5.   Explain cohen-sutherland algorithm for line clipping.
       Find clipped line for a window with lower left corner at (0,0)
       and upper right corner at (3,6). The line to be clipped has
       coordinates (1,-2) and (4,10)?
       Explain the method of Text clipping with suitable example ?
                                                    (8+8+4)

OR

Q6.   Find complete transformation that
       (a) Maps a window in world coordinates with both x-extent and
           y-extent from 1 to 10 mapped onto a viewport with x-extent
           ¼ to ¾ and y-extent from 0 to ½ in normalized device space.
       (b) Further maps a window with x-extent ¼ to ½ and y-extent
           ¼ to ½ in normalized device space on to a viewport with
           x-extent 1 to 10 and y-extent 1 to 10 on physical display
           device?   **(20)**

SECTION - D

Q7.   What do you understand by hidden surface removal? What
       are the different hidden surface removal methods? Explain
       any one of them.   **(5+5+10)**

OR

Q8.   Explain the characteristics of Bezier curves? Explain the
       various polygon representation methods and their
       characteristics?   **(6+14)**

SECTION - E

Q9.   Do any five out of the following: **(5x4)**
       (a) What are the applications of computer graphics in real world?
       (b) Explain aliasing and anti-aliasing?
       (c) What is resolution? Define aspect-ratio of a screen?
       (d) Differentiate between parallel and perspective projections?
       (e) What are fractals ? What are its applications?
       (f) Give   Three-Dimensional   homogeneous   matrix
           transformations for
           1.   Translation   2.   Rotation along z-axis
           3.   Scaling   4.   Reflection about XY plane