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53 (CS 604) CPGR

2017

**COMPUTER GRAPHICS**

Paper : CS 604

Full Marks : 100

Time : Three hours

***The figures in the margin indicate full marks for the questions.***

Answer ***any five*** questions.

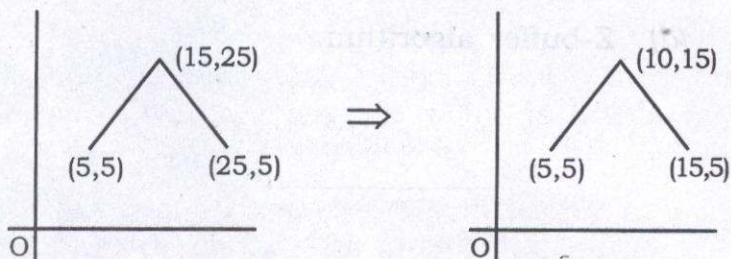
1. 2×10
- (a) What is pixel ?
  - (b) What do you mean by resolution ?
  - (c) What are the primary input-output device in a graphics system ?
  - (d) Define aspect ratio.
  - (e) What is the difference between Image Processing and Computer Graphics ?
  - (f) Define convex polygon.
  - (g) Formulate translation.

Contd.

- (h) What is homogeneous co-ordinate in computer graphics ?
- (i) What is the tangent continuity of a curve ?
- (j) Which *one* is not the rigid body transformation ?
- (i) Translation
  - (ii) Rotation
  - (iii) Shearing
  - (iv) Reflection.
2. (a) Write the Bresenham line drawing algorithm.
- (b) Applying the DDA algorithm calculate the pixels on the line AB, where co-ordinates of A and B are (0,0) and (8,4) respectively.
- 10+10
3. What do you mean by rotation ? Find the mathematical expression (i.e. rotational matrix) of rotation. Using the above expression, find the co-ordinate of the point (5,0) after rotation of  $45^\circ$  in the anti-clockwise direction. 20

4. (a) Describe shear operation.
- (b) What is scaling ? Find out the transformation matrix to perform the transformation shown in the figure :

5+15



5. (a) Describe the mid-point circle drawing algorithm.

- (b) Using this algorithm, calculate the pixels of a circle with centre at origin and radius is 10 unit.

10+10

6. (a) Describe a technique to find out whether a given point is inside of a polygon.

- (b) Describe the 4-connected polygon filling algorithm. Describe its advantages and disadvantages.

5+15

7. Write short notes on :

5×4

(a) Computer Animation

(b) Projection

(c) Cubic curve

(d) Z-buffer algorithm.