

Code: 9F00404c

MCA IV Semester Regular & Supplementary Examinations July 2015

### COMPUTER GRAPHICS

(For students admitted in 2009, 2010, 2011, 2012 and 2013 only)

Time: 3 hours

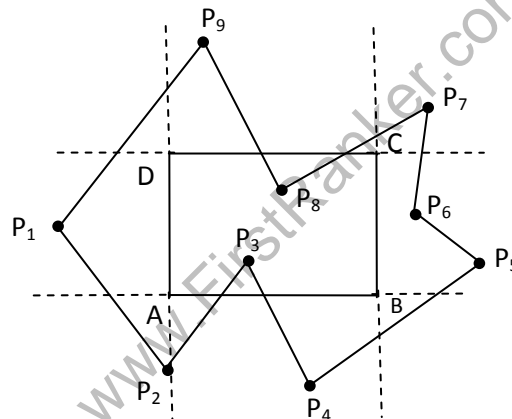
Max Marks: 60

Answer any FIVE questions

All questions carry equal marks

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- 1 (a) List and explain any three application areas of computer graphics.  
 (b) Differentiate between raster scan systems and random scan systems.
- 2 (a) Explain the steps required to scan-convert a circle using Bresenham's algorithm.  
 (b) What steps must be added to fill algorithm if a region is to filled with a pattern?
- 3 (a) Derive the transformation that rotates an object point  $\theta^\circ$  about the origin. Write the matrix representation for this rotation.  
 (b) Explain shear transformation with an example.
- 4 (a) Write Cohen-Sutherland line clipping algorithm.  
 (b) Clip the polygon  $P_1, \dots, P_9$  in figure below against the window ABCD using the Sutherland-Hodgman algorithm.



- 5 Write short notes on the following:
  - (a) Hermite curve.
  - (b) B-spline curves.
  - (c) Bezier surfaces.
- 6 (a) Define tilting as a rotation about the X axis followed by a rotation about Y axis.
  - (i) Find the tilting matrix.
  - (ii) Does the order of performing the rotation matter.
- (b) Give a brief note on 3-D viewing pipeline.
- 7 (a) List and explain the steps involved in z-buffer algorithm.  
 (b) Explain visibility-detection functions.

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- 8 Explain the general computer animation functions and computer animation languages.