Roll No.....................................

MCA - 403

M.C.A. IV Semester

Examination, December 2014

Computer Graphics And Multimedia

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) Discuss different categories of computer graphics.

   b) Briefly describe standards of graphics system.

   c) Standard TV has 480 scan lines if the aspect ratio is ¾. What is the capacity of frame buffer needed in 2 bits pixels are used.

   d) Write a c/c++ program to draw line using DDA method.

   OR

   Give the complete implementation in c/c++ of mid-point algorithm to generate the circle

   $(x + 2)^2 + (y - 3)^2 = 9$

Unit - II

2. a) Define 2D transformation and their types.

   b) Find equation of line $y' = mx' + b$ in x, y co-ordinate if the x', y' co-ordinate system results from a 90 degree rotation of x, y coordinate system.

   c) If a line segment with end points $(1, 2)$ and $(3, 4)$ under goes rotation about origin in anti-clock wise direction for $\pi/4$. Find new position of the line segment.

   d) Obtain mirror reflection of $\triangle ABC$ about the line passing through $(4, 6)$ and $(10, 15)$ where A, B and C has coordinate values $(0, 10)$, $(0, 50)$, $(-20, 30)$ respectively.

OR

Show that the composition of two rotation is additive by concatenating the matrix representatives for $R(\theta_1)$ and www.rgpvonline.com $R(\theta_2)$ to obtain

$R(\theta_1) R(\theta_2) = R(\theta_1 + \theta_2)$

Unit - III

3. a) Differentiate Gouraud shading and phong shading.

   b) What do you understand by windowing and clipping.

   c) Write simple line clipping algorithm.

   d) A rectangular clipping window has two opposite vertices located at $(0, 20)$ and $(20, -20)$. Use cohen sutherland algorithm to find visibility of the line segment from $(30, 30)$ to $(50, 0)$ against the given window.

OR

Derive the equation for mapping a point (x_w, y_w) defined in window to viewport location (x_v, y_v).

Unit - IV

4. a) Explain depth-buffer algorithm to solve hidden surface removal problem.

   b) Distinguish between parallel and perspective projection.

   c) Given a point P $(10, 20, 30)$ which undergoes the ahead sequence of transformations.

      i) Rotation with respect to y-axis by an angle 45°

      ii) Scaling with scaling factor $(1.5, 1, 0.5)$

      Calculate final position of P.

   d) Consider a line segment AB with end points A$(4, 3, 2)$ and B$(8, 3, 2)$. Find out the perspective projection of AB onto the plane $x = 0$ from the centre of projection at $x = -4$.

OR

Four control points $P_1 (70, 0)$, $P_2 (50, 0)$, $P_3 (120, 60)$, $P_4 (120, 30)$ are specified for a Bezier curve; obtain the coordinate of mid point of curve and draw a rough sketch of the curve.

Unit - V

5. a) What is the file size in bytes of 30 seconds of digitized audio using a 16-bit sample at 44 KHz.

   b) What do you understand by multimedia? Explain with its application.

   c) What do you mean by MIDI?

   d) What are components of a multimedia system?

OR

Describe different types of authoring tools.