Subject: COMPUTER GRAPHICS

Time: 3 Hours   **Max. Marks: 100**

JUNE 2011

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. Compression technique used in JPEG is

   (A) Loss less compression   **(B)** Lossy compression
   (C) Normally lossless   **(D)** Generally lossy

b. Which of the following is not a digital video format?

   (A) Ogg Theora   **(B)** JPEG 2007
   (C) MPEG   **(D)** WMV

c. Parametric representation of a line with end point is (2, 4) and (6, -7) and
   parameter t where $0 \le t \le 1$, is given by

   (A) (2 + 4t, 4 – 11t)   **(B)** (2 – 4t, 4 + 11t)
   (C) (2 + 6t, 4 – 7t)   **(D)** (4t, – 7t)

d. If a point (3, 6) is translated using value $t_x = -3$ and $t_y = 7$, then the new point
   is

   (A) (6, 1)   **(B)** (6, 13)
   (C) (0, 13)   **(D)** (0, 1)

e. Isometric projection is a type of _____ projections.

   (A) Axonometric   **(B)** Parallel
   (C) Orthographic   **(D)** All of these

f. Which of the following is **true** in context of clipping?

   (A) It stores only displayable part of object in memory frame.
   (B) It stores complete object but displays only that part that fits in the view port.
   (C) It initially stores complete object but once clipped, it discards the non-
        viewable part from memory.
   (D) Both **(A)** and **(C)** are true as per the availability of memory.

g. In the refresh process of an image on a raster terminal, which of the following statement is *true*:

    (A) The refresh memory stores the value of each pixel; therefore the refresh time is constant.
    (B) The raster terminals do not require refresh the image because it is stored in its memory.
    (C) The refresh memory (raster) stores the sequence of commands to redraw complete image.
    (D) The required time to refresh an image depends on the complexity of the scene to be rendered.

h. Which of the following processes is NOT part of the 2D transformation?

    (A) Clipping   **(B)** Translation
    (C) Scaling   **(D)** Rotation

i. Which of the following is not an input device?

    (A) Light pen   **(B)** Optical mouse
    (C) Digitizer   **(D)** None of the above

j. _____ uses set operations to model solid objects.

    (A) Swept solids   **(B)** Cubic splines
    (C) CSG models   **(D)** Cubic Bezier curves

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

Q.2 a. Write a short note on Interactive Graphics Systems.   **(8)**

     b. Define Graphics software. Differentiate between general programming package and special purpose application package.   **(8)**

Q.3 a. Write Line Drawing algorithm to draw a line between points (a, b) and (c, d).   **(8)**

     b. Explain Flood Fill algorithm for polygon filling with a suitable example.   **(8)**

Q.4 a. Find reflections of point (3, 4) with respect to x-axis and y-axis separately. Also find the corresponding transformation matrices.   **(8)**

     b. Determine sequence of basic transformations that are equivalent to the rotation of a point (x, y) around (1, 3) by an angle θ.   **(8)**

Q.5 a. Clip a line segment between points (1, 3) to (5, 17) using Cohen Sutherland clipping algorithm so that it fits into view port with left bottom at (2, 5) and right top at (5, 12). **(8)**

b. Differentiate between window and view port. What technique do we use to see large size graph on a comparatively smaller screen? **(8)**

Q.6 a. Find a rotation matrix to rotate the point (1, 2, 3) by $45°$ around origin in XY plane. Find transformed value of the point also. **(8)**

b. What is orthographic projection? Explain the term isometric, oblique and perspective projection. **(8)**

Q.7 a. Describe depth-buffer or z-buffer method for detecting visible surfaces. **(8)**

b. Write a short note on Back Face Detection method. **(8)**

Q.8 a. Describe in brief the steps required to produce real time animation. **(8)**

b. Define the term morphing and explain its use in key frame systems of animation. **(8)**

Q.9 a. What are various applications of multimedia? Why do they require a high end PC? **(8)**

b. Explain briefly the use of audio and visual elements in multimedia. **(8)**