

**AMIETE – CS/IT {NEW SCHEME}**

Time: 3 Hours

**DECEMBER 2014**

Max. Marks: 100

**PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.**

**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. Name the printer that also scans raster patterns from an internal frame buffer, rapidly sweeping a laser beam over an internal drawing surface?
- (A) Inkjet printer (B) Dot matrix printer  
(C) Laser printer (D) All of these
- b. \_\_\_\_\_ is used to control the basic display properties of output primitives.
- (A) attribute parameter (B) setpixel  
(C) getpixel (D) putpixel
- c. The technique of using a minimum number of intensity levels to obtain increased visual resolution is called \_\_\_\_\_
- (A) Dithering (B) Halftoning  
(C) Depth cueing (D) Rendering
- d. Name the clipping algorithm which performs clipping against a convex polygon, but instead of clipping a single line segment it clips an entire polygon (which needn't be convex) against the convex polygon and its output is again a polygon?
- (A) Cohen-Sutherland  
(B) Cyrus-Beck  
(C) Weiler-Atherton  
(D) Sutherland-Hodgman

- e. An important property assumed for diffuse scattering is that it is independent of the direction from the point, P, to the location of the viewer's eye. This is often called as \_\_\_\_\_.
- (A) Lambert's law  
(B) Refraction  
(C) Omnidirectional scattering  
(D) Specular reflection
- f. Transformation which compresses or expands the dimensions of an object.
- (A) Translation (B) Scaling  
(C) Rotation (D) Reflection
- g. When an input device is placed in \_\_\_\_\_, the program and device operate simultaneously.
- (A) Sample mode (B) Event mode  
(C) Action mode (D) Choice mode
- h. World coordinate system is something in which \_\_\_\_\_
- (A) the image is defined  
(B) the object is defined  
(C) the surfaces are defined  
(D) the transformations are defined
- i. If we rotate the point  $P = (3,1,4)$  through  $300^\circ$  about the Y-axis, then
- (A) the X-coordinate of the point is not altered  
(B) the Y-coordinate of the point is not altered  
(C) the Z-coordinate of the point is not altered  
(D) none of these
- j. Aliasing means
- (A) Rendering effect (B) Shading effect  
(C) Staircase effect (D) Cueng effect

---

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

---

- Q.2** a. Name some digital input devices and briefly explain them with respect to their functioning. (8)

- b. Compute the following: (2×4)  
(i) Size of 800 x 600 image at 240 pixels per inch.  
(ii) Resolution of 2 x 2 inch image that has 512 x 512 pixels.  
(iii) Height of the resized image 1024 x 768 to one that is 640 pixels wide with the same aspect ratio.  
(iv) Width of an image having height of 5 inches and an aspect ratio 1.5.
- Q.3** a. State and explain DDA algorithm for line drawing along with its drawbacks. (8)  
b. Discuss the two primary ways to describe the shape of a curved line. (8)
- Q.4** a. Explain the following functions related to Area-Fill attributes: (8)  
(i) setInteriorColourIndex(fc)  
(ii) setInteriorStyleIndex(pi)  
(iii) setPatternSize(dx, dy)  
(iv) setPixel(x, y, cp(y mod ny + 1, x mod nx + 1))  
b. Describe the different approaches to antialiasing techniques. (8)
- Q.5** a. Explain the effects of 3D geometric transformations. (8)  
b. Perform a 45° rotation of triangle A (0, 0), B (1, 1), C (5, 2) (2×4)  
(i) about the origin (ii) about P(-1, -1)
- Q.6** a. Explain Sutherland-Hodgeman algorithm for polygon clipping. For what type of clipping regions the algorithm is not suitable. Give reason. (8)  
b. Use the Liang-Barsky line clipping algorithm to clip the line P<sub>1</sub>(-15, -30) – P<sub>2</sub>(30, 60) against the window having diagonally opposite corners as (0, 0) and (15, 15). (8)
- Q.7** a. Explain, why there is a need for visible surface detection? Differentiate between object precision and image precision methods for detecting visible surface. (8)  
b. Describe Depth Buffer hidden surface elimination method. (8)
- Q.8** a. What are the various input mode functions that specify how the program and input devices interact? (8)  
b. Describe the various techniques that can be incorporated into graphics packages to aid the interactive construction of pictures. (8)
- Q.9** a. What do you mean by computer-assisted animation? Differentiate it with computer-generated animation. (8)  
b. Describe the methods for specifying the information needed to construct and manipulate a model. (8)