Code: AC60/AT60   **Subject: COMPUTER GRAPHICS**

AMIETE – CS/IT (Current Scheme)

Time: 3 Hours   **June 2019**   **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. The graphics can be
   (A) Drawing   **(B)** Photograph, movies
   (C) Simulation   **(D)** All of these

b. Types of computer graphics are
   (A) Vector and raster   **(B)** Scalar and raster
   (C) Vector and scalar   **(D)** None of these

c. Raster graphics is composed of
   (A) Pixels   **(B)** Path
   (C) Palette   **(D)** None of these

d. Raster images are more commonly called
   (A) Pix map   **(B)** Bitmap
   (C) Roadmap   **(D)** Rangemap

e. A translation is applied to an object by
   (A) Repositioning it along with straight line path
   (B) Repositioning it along with circular path
   (C) Both **(A)** and **(B)**
   (D) None of these

f. _____ is a rigid body transformation that moves object without deformation
   (A) Rotation   **(B)** Scaling
   (C) Translation   **(D)** All of these

g. The Bezier curve obtained from the four control points is called a
   (A) Square Bezier curve   **(B)** Cubic Bezier curve
   (C) Hectare Bezier curve   **(D)** Rectangle Bezier curve

h. The resolution of raster scan display is
   (A) Low   **(B)** High
   (C) Medium   **(D)** None of these

i. The process of applying a tangential force to any object in order to distort the object shape is known as
   (A) Scaling   **(B)** Translation
   (C) Rotation   **(D)** Shearing

j. A display controller serves to pass the contents of
   (A) Frame buffer to monitor   **(B)** Monitor to frame buffer
   (C) Both **(A)** & **(B)**   **(D)** None of these

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

Q.2 a. Define aspect ratio and resolution. How they are useful for Computer Graphics. **(6)**

   b. Illustrate various input and output devices in detail. **(10)**

Q.3 a. Explain the window to view port coordinate transformation with neat diagrams. **(8)**

   b. Explain Bresenham's line drawing algorithm. **(8)**

Q.4 a. Explain in detail the Cohen-Sutherland line clipping algorithm with an example. **(8)**

   b. Describe the Sutherland-Hodgman Polygon clipping algorithm. **(8)**

Q.5 a. Prove that two successive two-dimensional rotations are additive. **(8)**

   b. Show that a reflection about the line $y = -x$ is equivalent to a reflection relative to y-axis followed by a counter clockwise rotation of 90°. **(8)**

Q.6 a. Discuss parallel projection and perspective projection in detail. **(6)**

   b. Perform a perspective Projection of the unit cube onto the $x = 0$ plane from the center of Projection on x-axis at $x_c=10$. **(10)**

Q.7 a. Write short note on Flat Shading and Smooth Shading. **(6)**

   b. Explain Gouraud Shading and Phong Shading. **(10)**

Q.8 a. Define Pixmaps. How Pixmaps can be combined and manipulated? **(8)**

   b. Write a note on Aliasing and Antialiasing techniques. **(8)**

Q.9 a. What are Bezier curves and Cubic Bezier curves? Explain their properties and applications. **(10)**

   b. Discuss the methods for defining the regions. **(6)**