ROLL NO. _____

Code: AT14 Subject: IMAGE PROCESSING & COMPUTER G... S

AMIETE – IT (OLD SCHEME)

Time: 3 Hours **JUNE 2012** **Max. Marks: 10**

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. Frame buffer is _____.

(A) The memory area in which the image, being displayed, is stored
(B) The device which controls the refresh rate
(C) The device used for displaying the colors of an image
(D) The memory area in which the graphic package is stored

b. In Bresenham's circle generation algorithm, if (x,y) is the current pixel position then the x-value of the next pixel position is

(A) x **(B)** x-1
(C) x+1 **(D)** x+2

c. If two bits are zeros and two bits are ones in a code of a sub-region in Cohen – Sutherland line clipping algorithm then the sub region is

(A) Corner region **(B)** Middle region
(C) Central region **(D)** None of these

d. If (x,y,w), w≠0, is a point in the homogeneous coordinate system then it's equivalent in two dimensional system is

(A) (x,y,1) **(B)** (x,y,0)
(C) (x/w,y/w) **(D)** (x,y,x-y)

e. Parallel projection is characterized by the
(A) View plane alone
(B) Direction of projection and the view plane
(C) Center of projection and the view plane
(D) Center of projection alone

f. The Z-buffer algorithm

(A) Finds the largest depth value z
(B) Finds the smallest depth value z
(C) Finds the average of the frame buffer
(D) Calculate the intensity at (x,y)

g. How many shades of grey are there in a 6 bit image?

(A) 26 **(B)** 64
(C) 256 **(D)** 63

h. Image enhancement can be achieved in which of the following domain:

(A) Frequency **(B)** Spatial
(C) Frequency & spatial **(D)** None of the above

i. Lossless compression means

(A) Restored data file is different to the original
(B) Restored data file is identical to the original
(C) Both **(A)** & **(B)**
(D) None these

j. Lossy Predictive coding includes which type of coding:

(A) DPCM **(B)** DM
(C) DPCM AND DM **(D)** Runlength coding

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

Q.2 a. Explain the digital differential analyzer line drawing algorithm. **(8)**

b. Perform a 45^0 rotation of triangle A(0,0), B(1,1), C(5,2) about P(-1,-1). **(8)**

Q.3 a. Explain the Cohen-Sutherland line clipping algorithm. **(8)**

b. Explain the following 3-D geometric transformations: **(8)**
(i) Translation
(ii) Scaling
(iii) Rotation

Q.4 a. Describe two- point and three- point perspective projections for a cube. **(8)**

b. What do you understand by transformation from world to viewing coordinates? Explain. **(8)**

Q.5 a. Describe the back-face detection algorithm for visible surface detection. **(8)**

b. Given points P1(1,2,0) , P2(3,6,20) and P3(2,4,6) and a viewpoint C(0,0,-10), determine which points obscure the others when viewed from C. **(8)**

Q.6 a. Write short notes on **(8)**
(i) Image sampling and Quantization
(ii) Local Enhancement

b. Describe the linear spatial filter for smoothing. **(8)**

Q.7 a. Explain the basic steps for filtering in frequency domain. **(8)**

b. Describe a 2-D Ideal Lowpass Filter. **(8)**

Q.8 a. Explain the LZW coding technique for compression with the help of an example. **(8)**

b. Explain the following: **(8)**
(i) Transform coding with DCT
(ii) Liquid Crystal Display

Q.9 Describe the following:

(i) Region Splitting and Merging **(8)**
(ii) Edge Detection in an Image **(8)**