



Higher National Diploma in Information Technology

2nd Year, Second Semester Examination – 2015

HNDIT2414 – Graphics and Animation

Instructions for Candidates:

No. of Questions : 06

Answer Five Questions Only

No. of Pages :

Time : 3 Hours

Question 01

- (i) What do you mean by terms ‘Computer Graphics’, ‘Image Processing’ and ‘Computer Animation’? (3 marks).
- (ii) List down the hardware components and software components in Computer Graphics Systems? (4 marks)
- (iii) Write the full forms of the followings (4 Marks)
 - a) CGA
 - b) MPEG
 - c) MIDI
 - d) JPEG
- (iv) List down 5 general tasks in the Multimedia projects? (5 marks)
- (v) State Three functions and characteristics of following members in a multimedia development team (4 marks)
 - a) Project Manager
 - b) Quality Assurance Engineer

Question 02

- (i) Draw and explain the OpenGL pipeline architecture briefly? (6 marks)
- (ii) Write code to include any two header files into OpenGL? (2 marks)
- (iii) Consider that you are going to draw the rectangle using OpenGL. Complete the program given below by filling w, x, y and z (12 Marks)

```

const int A = 500; // length of a side of the monitor window
const float B = 500; // length of a side of the clipping rectangle
const float C = 200; // length of a side of the square
void display( void )
{
  glClear(GL_COLOR_BUFFER_BIT
  glMatrixMode(GL_MODELVIEW);
  glLoadIdentity();
  glBegin(GL_POLYGON) ;
  glColor3f ( 1.0, 0.3, 0.2);
  glVertex2f( -C/2, -C/2 );
  .....W.....
  .....X.....
  .....Y.....
  glEnd();
  .....Z.....
}

```

Question 03

- (i) List down the difference between Binary Images and Gray scale Images? (4 Marks)
- (ii) Explain HSV Color Model (you have to explain all 3 properties clearly)? (4 Marks)
- (iii) Write 4 Basic Properties of Video? (4 Marks)
- (iv) What are the advantages and disadvantages of Digital Audio? (4 Marks)
- (v) Calculate the memory needed to store the following multimedia Components? (4 Marks)
 - a) Uncompressed 2 minutes of digital Video of 400 x 600 pixels recorded at 1000 frames per Minute stored in 16 bites.
 - b) 3 byte stereo quality of 44.1 Khz ,5 minutes single track audio CD

Question 04

- (i) What do you understand by the term Motion graphics? (2 Marks)
- (ii) List down 3 Animation tools? (3 Marks)
- (iii) What are the process in the Planning stage when you creating animations? (3 Marks)
- (iv) What do you mean by following terms in Principles of animations (6 Marks)

- a) Anticipation
- b) Exaggeration
- c) Staging

(v) What are the two methods of creating animation briefly explain them? (6 marks)

Question 05

- (i) What do you mean by term ‘Persistence’ in CRT? (4 Marks)
- (ii) List down the difference between Vector scan display and Raster scan display? (4 Marks)
- (iii) Define the circle function and Cartesian equation for a straight line. (4 Marks)
- (iv) Using Digital Differential Analyzer (DDA) describe the line segment which starts at (5, 5) and ends at (10, 15). You have to find the all pixel points. (8 Marks)

$$m = (15-5)/(10-5)$$

$$= 10/5$$

$$= 2$$

So slope is Positive and greater than 1

$$x = 1/m$$

$$= 1/2$$

$$= 0.5$$

$$y = 1$$

So

| Y | X | actual point | Pixel point |
|----|-----|--------------|-------------|
| 5 | 5 | (5,5) | (5,5) |
| 6 | 5.5 | (5.5,6) | (6,6) |
| 7 | 6 | (6,7) | (6,7) |
| 8 | 6.5 | (6.5,8) | (7,10) |
| 9 | 7 | (7,9) | (7,9) |
| 10 | 7.5 | (7.5,10) | (8,10) |
| 11 | 8 | (8,11) | (8,11) |
| 12 | 8.5 | (8.5,12) | (9,12) |
| 13 | 9 | (9,13) | (9,13) |
| 14 | 9.5 | (9.5,14) | (10,14) |
| 15 | 10 | (10,15) | (10,15) |

Question 06

- (i) Explain the following transformation with the matrix representation in a 2D and 3D Environment. Also give suitable diagram for illustration. (8 Marks)
 - a) Translation
 - b) Scaling
- (ii) Explain what rotation in 2D environment with suitable diagram is (6 Marks)
- (iii) Give three Pre-defined affine transformations in OpenGL (3 Marks)
- (iv) Give three different types of rotation 3D environment? (3 Marks)