

**G H Patel Post Graduate Department of Computer Science and Technology  
Sardar Patel University**

**Master of Computer Applications (MCA) – Vth Semester  
PS05CMCA04 : Computer Graphics (Internal Test)**

Date : 6<sup>th</sup> October, 2012

**ax. Time : 1 hour and 30 minutes.**

**te: Time limit for Section – I is 10 minutes and Time limit for Section – II is 1 hour and 20 minutes**

**Q3. Do as directed [Any FOUR]**

**Section – II**

**10**

- i. Write the steps to design and develop a multimedia project.
- ii. Write the steps to convert the value given in YIQ model to CMY color model.
- iii. Discuss the features of PNG graphics file format.
- iv. Consider the following figure where each small rectangle represents a pixel and the value inside it is gray level at that pixel. Hence, whole array represents a digital image  $g(r,c)$  of size  $5 \times 5$ . Sharpen the centre pixel  $g(2,2)$ , which is underlined using Laplacian second order derivative operator using 8-connectivity.

0	1	0	6	7
2	0	1	6	5
1	1	2	5	6
1	0	6	6	5
2	5	6	7	6

- v. Suppose  $M$  be the gray level of input image, which has to be transformed to  $L$  by linear stretching. Then  $L$  is the gray level of the output image. Let  $N_i$  and  $N'_i$  are the number of pixel having  $i$ -th gray level in the input and the output images respectively. Suppose for an 8-level image we have following frequency table for the input gray levels. Using linear stretching find the frequency table for the output gray levels.

i	0	1	2	3	4	5	6	7
$N_i$	0	0	400	600	300	200	100	0

**Q4. Do as directed.**

- i. Explain Trackball and Space ball. **3**
- ii. Draw the diagram that explains the working of the liquid crystal display system. **2**
- iii. Write a note on tint fill algorithm. **4**
- iv. What do you mean by bundled attributes? **1**

**G H Patel Post Graduate Department of Computer Science and Technology  
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**Master of Computer Applications (MCA) – Vth Semester**

**PS05CMCA04 : Computer Graphics (Internal Test)**

**Date : 14<sup>th</sup> September, 2013**

**Max. Time : 1 hour and 30 minutes.**

**Note:** Time limit for Section – I is 10 minutes and Time limit for Section – II is 1 hour and 20 minutes

**Section – II**

**Q3. Do as directed [Any FOUR]**

**10**

- i. Write short note the process of developing 3-dimensional animation.
- ii. Explain with diagram the different stages of image processing & analysis system.
- iii. Discuss the features of PNG graphics file format which are not supported by GIF.
- iv. Consider the following figure where each small rectangle represents a pixel and the value inside it is gray level at that pixel. Hence, whole array represents a digital image  $g(r,c)$  of size  $5 \times 5$ . Sharpen the centre pixel  $g(2,2)$ , which is underlined using Laplacian second order derivative operator using 4-connectivity.

0	1	0	6	7
2	0	2	6	5
1	3	<u>7</u>	4	6
1	0	6	6	5
2	5	6	7	6

- v. Suppose  $M$  be the gray level of input image, which has to be transformed to  $L$  by linear stretching. Then  $L$  is the gray level of the output image. Let  $N_i$  and  $N'_i$  are the number of pixel having  $i$ -th gray level in the input and the output images respectively. Suppose for an 8-level image we have following frequency table for the input gray levels. Using linear stretching find the frequency table for the output gray levels.

i	0	1	2	3	4	5	6	7
$N_i$	0	0	a	b	c	d	e	0

**Q4. Do as directed.**

- i. Write (only) steps of DDA line drawing algorithm. **3**
- ii. Explain bitmap and outline fonts in brief. **2**
- iii. Explain graphics software in brief. **2**
- iv. Differentiate between raster scan and random scan systems. **3**

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G.H Patel Post Graduate Department of Computer Science and Technology  
Sardar Patel University

Master of Computer Applications (MCA) – Vth Semester  
PS05CMCA04 : Computer Graphics (Internal Test)  
Date : 14<sup>th</sup> September, 2013

Max. Time : 1 hour and 30 minutes.

Note: Time limit for Section – I is 10 minutes and Time limit for Section – II is 1 hour and 20 minutes

Section – II

10

Q3. Do as directed [Any FOUR]

- Write short note the process of developing 3-dimensional animation. ✓
- Explain with diagram the different stages of image processing & analysis system. ✓
- Discuss the features of PNG graphics file format which are not supported by GIF. ✓
- Consider the following figure where each small rectangle represents a pixel and the value inside it is gray level at that pixel. Hence, whole array represents a digital image  $g(r,c)$  of size  $5 \times 5$ . Sharpen the centre pixel  $g(2,2)$ , which is underlined using Laplacian second order derivative operator using 4-connectivity.

0	1	0	6	7
2	0	2	6	5
1	3	<u>7</u>	4	6
1	0	6	6	5
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Suppose  $M$  be the gray level of input image, which has to be transformed to  $L$  by linear stretching. Then  $L$  is the gray level of the output image. Let  $N_i$  and  $N'_i$  are the number of pixel having  $i$ -th gray level in the input and the output images respectively. Suppose for an 8-level image we have following frequency table for the input gray levels. Using linear stretching find the frequency table for the output gray levels.

i	0	1	2	3	4	5	6	7
$N_i$	0	0	a	b	c	d	e	0

Q4. Do as directed.

- Write (only) steps of DDA line drawing algorithm. ✓ 3
- Explain bitmap and outline fonts in brief. ✓ 2
- Explain graphics software in brief. ✓ 2
- Differentiate between raster scan and random scan systems. ✓ 3

**G H Patel Post Graduate Department of Computer Science and Technology**  
**Sardar Patel University**

**Master of Computer Applications (MCA) – 5<sup>th</sup> Semester**

**PS05CMCA04: Computer Graphics (Internal Test)**

**Date: 26<sup>th</sup> September, 2014**

: 30

[14]

[3]

[2]

[3]

[2]

[4]

**Note: Time limit for Section – I is 10 minutes and Time limit for Section – II is 1 hour and 20 minutes**

**ax. Time : 1 hour and 30 minutes.**

**Marks: 30**

**Section – II**

**Q3. Do as directed [Any FOUR]**

**10**

- i. Write the steps to develop a multimedia project.
- ii. Explain briefly the image digitization process.
- iii. Write the steps to convert the color value given in YIQ color model to CMY color model.
- iv. Consider the following figure where each small rectangle represents a pixel and the value inside it is gray level at that pixel. Hence, whole array represents a digital image  $g(r,c)$  of size  $5 \times 5$ . Sharpen the centre pixel  $g(2,2)$ , which is underlined using crispening method using 4-connectivity.

0	1	0	6	7
2	0	2	6	5
1	3	2	4	6
1	0	6	6	5
2	5	6	7	6

- v. Compare the features of PNG graphic file format and GIF.

**Q4. Do as directed.**

- i. List application areas of computer graphics and multimedia. Briefly explain any one of them by giving suitable example. 2
- ii. Explain Interlaced refresh procedure. 2
- iii. Explain raster methods for transformations. 3
- iv. In context of midpoint circle algorithm, define the circle function  $f(x, y)$ . How does the return value of this function decide the position of pixel regarding to the circle boundary? 3

Note: Time limit for Section - I is 15 minutes and Time limit for Section - II is 1 hour and 15 minutes

Marks: 35

Max. Time: 1 hour and 30 minutes.

Section - II

Q2. Do as directed

- i. Briefly explain outlined fonts. [2]  
ii. Draw the 2D viewing transformation pipeline. [2]  
iii. Write steps of DDA line drawing algorithm. [3]  
iv. Magnify a triangle with vertices A(0,0), B(1,1), C(5,2) to two times with respect to origin. [3]

[10]

Q3. Do as directed.

i. Write about different components of Image Processing and Analysis system.

ii. Discuss briefly the features of authoring package.

iii. Write the steps to convert RGB color value in YCbCr model.

iv. Suppose M be the gray level of input image, which has to be transformed to L by linear stretching, then L is the gray level of the output image. Let  $N_i$  and  $N'_i$  are the number of pixel having i-th gray level in the input and the output images respectively. Using linear stretching, for the following frequency table, find the output gray levels.

i	0	1	2	3	4	5	6	7
$N_i$	0	0	500	300	200	400	100	0

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SARDAR PATEL UNIVERSITY  
Master of Computer Application (Fifth Semester)  
PS05CMCA04: Computer Graphics  
21<sup>st</sup> November 2016

Time: 11:00 A.M. to 2:00 P.M.

Marks: 70

181  
6  
5

Q1. Choose the most appropriate option for each question.

- i. VFX is acronym of \_\_\_\_\_  
A. Visual Frequency eXchange      B. Visual Frequency eXpert  
C. Visual Effects      D. None of these
- ii. Which of the following 2D geometric transformation does require "pivot point"?  
A. Translation    B. Rotation    C. Reflection    D. None of these
- iii. Which of the following form of text clipping will remove whole string if any single character is outside the clip window?  
A. Component    B. All or none character    C. All or none string    D. All of above
- iv. Which of the following algorithm is the best choice for anti aliasing?  
A. Flood fill    B. Boundary fill    C. Tint fill    D. Jagged fill
- v. \_\_\_\_\_ may be defined as an attempt to estimate the original image by applying effective inversion of the degrading phenomenon.  
A. Image Enhancement    B. Improvement    C. Image restoration    D. None of given
- vi. The technique of applying (or wrapping) 2D images over 3D wire frame models is called \_\_\_\_\_.  
A. Material application    B. Texture mapping    C. Wrapping    D. None of given
- vii. The television industry uses \_\_\_\_\_ color model.  
A. CMY    B. YCbCr    C. RGB    D. None of given
- viii. The concept of visualizing the animation sequence to be developed as a series of frames and exhibiting the same roughly in paper is known as \_\_\_\_\_.  
A. conceptualizing    B. Story boarding    C. Planning    D. None of given

Q2. Answer the following questions (Any seven):

[14]

L1

- i. List application areas of computer graphics. 1
- ii. What do you mean by output primitives and their attributes?
- Briefly explain point clipping. 1
- Differentiate bitmap fonts and outline fonts.
- Write a short note on back face detection.
- vi. State the features of PNG graphics file not supported by GIF. 1
- vii. Explain briefly the steps for Image digitization.
- viii. List out the types of audio cards with their utility. 1
- ix. Explain the terms: Animation and Image Analysis. 1

**Q3. Answer the following questions:**

- a. Write a note on shadow mask method.
- b. Write a note on boundary fill algorithm.

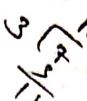
C-4 7016

OR

- D b. Write a note on DDA line drawing algorithm. [6]

**Q4. Answer the following questions:**

- a. Write a note on Cohen-Sutherland line clipping algorithm. [6]
- b. Explain 3D viewing pipeline. [6]



OR

- e b. Explain: parallel projection, perspective projection, and depth cueing. [6]

**Q5. Do as directed.**

- F 2 i. Write the steps to convert RGB color model into YIQ color model. [6]

ii. How many Kilo Bytes will required to store stereo audio recording at sampling size 16 bit at sampling rate 44 kHz for one second? [2]

- b. Write the steps to develop 3-dimensional animation. [6]

OR

- R b. Explain briefly the multimedia project development process. [6]

**Q6. Do as directed.**

- 2 a. Write short note on authoring methodology with examples(s). [6]

5 b. Suppose M be the gray level of input image, which has to be transformed to L by linear stretching. Then L is the gray level of the output image. Let  $N_i$  and  $N'_i$  are the number of pixel having  $i$ -th gray level in the input and the output images respectively. Suppose for an 8-level image we have following frequency table for the input gray levels. Using linear stretching find the frequency table for the output gray levels. [4]

i	0	1	2	3	4	5	6	7
$N_i$	0	0	a	b	c	d	e	0
	0	b	c	0	d	0	0	0

OR

- b. Consider a small image of 5X5 pixels having following pixel values. [6]

0	1	0	6	7
2	0	1	6	5
1	1	2	5	6
1	0	6	6	5
2	5	6	7	6

Smooth the image for a pixel (2,2) (underlined pixel) using Mean filter, Median filter and Min filter in a special domain 3 X 3.

&&&&&

Time limit for Section - I is 15 minutes and Time limit for Section - II is 1 hour and 15 minutes  
Time: 1 hour and 30 minutes.

Marks: 35

Section - II

Do as directed

List different graphic software standards. Briefly explain any one of them. C32 [2]

Briefly explain parallel and perspective projections. [2]

Write steps of Bresenham's line drawing algorithm. [3]

Magnify a triangle with vertices A(0,0), B(1,1), C(5,2) to three times with respect to origin. [3]



[10]

3. Do as directed.

i. Explain briefly the steps to design and develop multimedia project. C3 [3]

ii. Explain briefly the image digitization process. [3]

iii. Write the steps to convert the color value given in YIQ color model to RGB color model. [3]

iv. Write the steps to design multimedia text. [3]

v. Define graphics file format and write the features of PNG file format which are not supported by GIF. [3]

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(98/A-24)

No. of Printed Pages: 9

Sardar Patel University  
Master of Computer Application – FIFTH SEMESTER  
PS05CMCA04: Computer Graphics  
30<sup>th</sup> October 2018, Tuesday

Time: 2 PM to 5 PM

Max Marks: 70

- Q1. Choose the most appropriate option for each question. [8]
- The most basic shape that can be printed as an output by the output device is called as \_\_\_\_\_.  
a. Object    b. Line    c. Output Primitive    d. Point
  - CGI and CGM have been developed to overcome the limitations of \_\_\_\_\_.  
a. Open GL    b. PHIGS    c. GK    d. GKM
  - In \_\_\_\_\_ type of 2-D geometric transformation, the shape of object always changes.  
a. Rotation    b. Scaling    c. Shear    d. Reflection
  - Which of the following algorithm is the best choice for anti aliasing?  
a. Flood fill    b. Boundary fill    c. Tint fill    d. Jagged fill
  - The television industry uses \_\_\_\_\_ color model.  
a. CMY    b. YCbCr    c. RGB    d. None of given
  - \_\_\_\_\_ may be defined as an attempt to estimate the original image by applying adhoc algorithms.  
a. Image Enhancement    b. Improvement    c. Image restoration    d. None of given
  - The technique of applying (or wrapping) 2D images over 3D wire frame models is called \_\_\_\_\_.  
a. Material application    b. Texture mapping    c. Wrapping    d. None of given
  - The process of removing unwanted sounds that crept in, during the recordings is known as \_\_\_\_\_.  
a. Dithering    b. Trimming    c. Splicing    d. None of given

Q2. Answer the following questions (Any seven):

[14]

- Briefly explain bitmap fonts.
- Draw the structural diagram of raster scan CRT monitor.
- What is odd-even rule to test position of a point regarding polygon?
- Draw the 2D viewing transformation pipeline.
- List methods of text clipping. Give example of any one of them.
- List out the features of PNG file format.
- List out the basic components of sound card with its uses.
- How many bits will require for storing a 16 bit sound system, recording signals at 44 KHz in stereo recording for 1 minute?
- Explain briefly the concept of Multi-Valued Image Processing.

①

(P.T.O)

**Q3. Do as directed.**

- a. Magnify a triangle with vertices A(0,0), B(1,1), C(5,2) to three times [6]  
(i) while keeping C(5,2) fixed      (ii) with respect to origin.  
b. What are the main problems while increasing line width? Explain the solution of any one problem in detail. [6]

OR

- b. Write the steps of midpoint circle generation algorithm. Explain the use of symmetric nature of the circle in executing this algorithm. [6]

**Q4. Do as directed.**

- a. Explain Sutherland-Hodgeman polygon clipping algorithm. [6]  
b. Explain (i) parallel projection and (ii) perspective projection. [6]

OR

- b. Briefly explain classification of visible surface detection algorithms. Write a note on any of the method falling in these categories. [6]

**Q5. Do as directed.**

- a. Explain briefly, with diagram the different stages of Image processing and analysis. [6]

b. Answer the following questions:

- i. Write the steps to convert color value in YCbCr color model to RGB color model.  
ii. Explain briefly the pitfalls that can occur during digital recording with reason. [6]

OR

- b. Write short note on characteristics of Authoring tool. [6]

**Q6. Do as directed.**

- a. Consider the following figure where each small rectangle represents a pixel and the value inside it is gray level at that pixel. Hence, whole array represents a digital image  $g(r,c)$  of size  $5 \times 5$ . [6]

0	1	0	6	7
2	0	2	6	5
1	3	7	4	6
1	0	6	6	5
2	5	6	7	6

- (i) Sharpen the centre pixel  $g(2,2)$ , which is underlined by crispening using 4-connectivity.  
(ii) Smooth the centre pixel  $g(2,2)$  in  $3 \times 3$  neighbourhood using median filter.

- b. Write the steps to develop three dimensional animations. [6]

OR

b. Answer the following questions:

- i. Explain briefly the image digitization process.  
ii. Define: Dithering, Image Restoration and Image Analysis. [6]

SEAT No. \_\_\_\_\_

No. of Printed Pages : 02

Marks : 30

Sardar Patel University  
Master of Computer Application  
SEMESTER - V Examination  
PS05CMCA04: Computer Graphics

13<sup>th</sup> April, 2019 (Saturday)

Max Marks: 70

Time: 10:00 AM to 1:00 PM

- Q1. Choose the most appropriate option for each of the following question. [8]
- i. VFX means \_\_\_\_\_  
a. Visual Effects      b. Visual Functions      c. Visual Frequency      d. None of given
  - ii. Full form of CRT is \_\_\_\_\_  
a. Cathode Ray Tube      b. Cathode Red Tube      c. Cathode Ray Travrsal      d. None of given
  - iii. In Cohen – Sutherland line clipping algorithm, \_\_\_\_\_ number of bits are used to detect region code.  
a. 2      b. 4      c. 8      d. 16
  - iv. Which of the following is not an example of blobby object?  
a. Water Droplet      b. Human Muscle      c. Iris      d. None of given
  - v. The photoreceptor cells called \_\_\_\_\_ are responsible for color identification of the object.  
a. Fovea      b. Rods      c. Cones      d. None of given
  - vi. \_\_\_\_\_ may be defined as an attempt to estimate the original image by applying adhoc algorithms.  
a. Image Enhancement      b. Improvement.      c. Image restoration      d. None of given
  - vii. Flash is a \_\_\_\_\_ Authoring Tool.  
a. Frame based      b. Time based      c. Icon based      d. All of given
  - viii. The process of removing unwanted sounds that crept in, during the recordings is known as \_\_\_\_\_  
a. Dithering      b. Trimming      c. Splicing      d. None of given

Q2. Answer the following questions (Any seven):

[14]

- i. List the names of the colors generated by beam penetration method.
- ii. What is even parity rule for determining inside or outside region?
- iii. Differentiate: PHIGS and GKS
- iv. What is exterior clipping?
- v. What object space method for visible surface detection?
- vi. List out the features of PNG graphics file format..
- vii. How many bytes will require for storing a 32 bit sound system, recording signals at 44 KHz in stereo recording for 2 minutes?
- viii. List out atleast four color models with its uses.
- ix. List out the main facets of Multimedia technology with their uses.

(1)

(P.T.O)

**Q3.** Answer the following questions:

- a. Write a note on Random Scan Display and Raster Scan Display. [6]  
b. Write steps of Bresenham's line drawing algorithm. [6]

OR

- b. Write steps of boundary fill procedure. Explain drawbacks and solutions of boundary fill. [6]

**Q4.** Answer the following questions:

- a. Write a note on 2D viewing pipeline. [6]  
b. Write a note on text clipping. [6]

OR

- b. Explain parallel and perspective projections by giving suitable examples. [6]

**Q5.** Answer the following questions:

- a. Define animation and write the steps to develop 3-dimentional animation. [6]

- b. Do as directed.

i. Write the steps to convert color value in YIQ color model to RGB model.

ii. Define: Dithering, Image Analysis and Image Understanding.

OR

- b. Explain briefly atleast six features of Authoring tool. [6]

**Q6.** Answer the following questions:

- a. Write short note on Image Digitization process. [6]

- b. Explain briefly with diagram the different stages of Image Processing & Analysis scheme. [6]

OR

- b. Consider the following figure where each small rectangle represents a pixel and the value inside it is gray level at that pixel. Hence, whole array represents a digital image  $g(r,c)$  of size  $5 \times 5$ . Sharpen the centre pixel  $g(2,2)$ , which is underlined using Laplacian second order derivative operator using 4-connectivity. [6]

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SEAT No. \_\_\_\_\_

Marks : 30

## Sardar Patel University

No. of Printed Pages : 02

Master of Computer Application

SEMESTER – V Examination

PS05CMCA04: Computer Graphics

13<sup>th</sup> April, 2019 (Saturday)

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[14]

[3]

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[2]

[4]

Time: 10:00 AM to 1:00 PM

Max Marks: 70

Q1. Choose the most appropriate option for each of the following question.

[8]

- i. VFX means \_\_\_\_\_
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  - b. Visual Functions
  - c. Visual Frequency
  - d. None of given
- ii. Full form of CRT is \_\_\_\_\_
  - a. Cathode Ray Tube
  - b. Cathode Red Tube
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- iii. In Cohen – Sutherland line clipping algorithm, \_\_\_\_\_ number of bits are used to detect region code.
  - a. 2
  - b. 4
  - c. 8
  - d. 16
- iv. Which of the following is not an example of blobby object?
  - a. Water Droplet
  - b. Human Muscle
  - c. Iris
  - d. None of given
- v. The photoreceptor cells called \_\_\_\_\_ are responsible for color identification of the object.
  - a. Fovea
  - b. Rods
  - c. Cones
  - d. None of given

- vi. \_\_\_\_\_ may be defined as an attempt to estimate the original image by applying adhoc algorithms.
  - a. Image Enhancement
  - b. Improvement
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  - c. Icon based
  - d. All of given
- viii. The process of removing unwanted sounds that crept in, during the recordings is known as \_\_\_\_\_.
  - a. Dithering
  - b. Trimming
  - c. Splicing
  - d. None of given

Q2. Answer the following questions (Any seven):

[14]

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(1)

(P.T.O.)

**Q3. Answer the following questions:**

- a. Write a note on Random Scan Display and Raster Scan Display. [6]  
b. Write steps of Bresenham's line drawing algorithm. [6]

**OR**

- b. Write steps of boundary fill procedure. Explain drawbacks and solutions of boundary fill. [6]

**Q4. Answer the following questions:**

- a. Write a note on 2D viewing pipeline. [6]  
b. Write a note on text clipping. [6]

**OR**

- b. Explain parallel and perspective projections by giving suitable examples. [6]

**Q5. Answer the following questions:**

- a. Define animation and write the steps to develop 3-dimentional animation. [6]  
b. Do as directed.  
i. Write the steps to convert color value in YIQ color model to RGB model.  
ii. Define: Dithering, Image Analysis and Image Understanding.

**OR**

- b. Explain briefly atleast six features of Authoring tool. [6]

**Q6. Answer the following questions:**

- a. Write short note on Image Digitization process. [6]  
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**OR**

- b. Consider the following figure where each small rectangle represents a pixel and the value inside it is gray level at that pixel. Hence, whole array represents a digital image  $g(r,c)$  of size  $5 \times 5$ . Sharpen the centre pixel  $g(2,2)$ , which is underlined using Laplacian second order derivative operator using 4-connectivity. [6]

0	1	0	6	7
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1	3	<u>7</u>	4	6
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2	5	6	7	6

→ ←   
 (2)