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

Master of Computer Applications (MCA) – 5th Semester

PS05CMCA04: Computer Graphics (Internal Test)

Date: 26th September, 2016

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

Max. Time: 1 hour and 30 minutes.

Marks: 35

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]

Q3. Do as directed.

[10]

- 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 |

M14006

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

Master of Computer Applications (MCA) – 5th Semester
PS05CMCA04: Computer Graphics (Internal Test)

Date: 10th September, 2016

Time limit for Section – I is 15 minutes and Time limit for Section – II is 1 hour and 15 minutes

Marks: 35

Time: 1 hour and 30 minutes.

Section – II

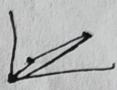
Do as directed

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]

[3]

[10]

Do as directed.

Explain briefly the steps to design and develop multimedia project.



Explain briefly the image digitization process.

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

Write the steps to design multimedia text.

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

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 : 14th September, 2013

x. Time : 1 hour and 30 minutes.

Time limit for Section - I is 10 minutes and Time limit for Section - II is 1 hour and 20 minutes

Section - II

i. Do as directed [Any FOUR]

10

Write short note the process of developing 3-dimensional animation. ✓

Explain with diagram the different stages of image processing & analysis system.

- i. Discuss the features of PNG graphics file format which are not supported by GIF. ✓
- v. 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 5×5 . 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 |

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

✓

G H Patel Post Graduate Department of Computer Science and Technology
Sardar Patel University
Master of Computer Applications (MCA) – 5th Semester
PS05CMCA04: Computer Graphics (Internal Test)
Date: 26th September, 2014

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

Max. 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 5×5 . 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 | <u>7</u> | 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

[18/A-17]

SEAT No. _____

No. of Printed Pages : 02

Sardar Patel University

Master of Computer Application

SEMESTER – V Examination

PS05CMCA04: Computer Graphics

13th April, 2019 (Saturday)

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 ____
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.)

Time: 11:00

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 5×5 . 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 |
| 2 | 0 | 2 | 6 | 5 |
| 1 | 3 | 2 | 4 | 6 |
| 1 | 0 | 6 | 6 | 5 |
| 2 | 5 | 6 | 7 | 6 |

i

— x —
②

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

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

Marks: 70

26
6

Q1. Choose the most appropriate option for each question.

VFX is acronym of _____

- A. Visual Frequency eXchange B. Visual Frequency eXpert
C. Visual Effects D. None of these

Which of the following 2D geometric transformation does require "pivot point"?

- A. Translation B. Rotation C. Reflection D. None of these

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

Which of the following algorithm is the best choice for anti aliasing?

- A. Flood fill B. Boundary fill C. Tint fill D. Jagged fill

_____ 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

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 television industry uses _____ color model.

- A. CMY B. YCbCr C. RGB D. None of given

vii. 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]

4

i. List application areas of computer graphics. 1

ii. What do you mean by output primitives and their attributes?

iii. Briefly explain point clipping. 5

iv. Differentiate bitmap fonts and outline fonts.

v. 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. 10 5

- 2016 Q3. Answer the following questions:
- Write a note on shadow mask method.
 - Write a note on boundary fill algorithm.

OR

[6]

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

[6]

- Q4. Answer the following questions:

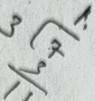
[6]

- a. Write a note on Cohen-Sutherland line clipping algorithm.

[6]

- b. Explain 3D viewing pipeline.

[6]



OR

[6]

- b. Explain parallel projection, perspective projection, and depth cueing.

[6]

- Q5. Do as directed.

[6]

- 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?

[6]

- b. Write the steps to develop 3-dimensional animation.

OR

[6]

- b. Explain briefly the multimedia project development process.

[6]

- Q6. Do as directed.

[6]

- a. Write short note on authoring methodology with examples(s).

[6]

- 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.

| 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

[6]

- b. Consider a small image of 5×5 pixels having following pixel values.

[6]

| | | | | |
|---|---|---|---|---|
| 0 | 1 | 0 | 6 | 7 |
| 2 | 0 | 1 | 6 | 5 |
| 1 | 1 | 7 | 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 3×3 .

&&&&&

(98/A-24)

TEAT No.....

No. of Printed Pages: 2

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

Time: 2 PM to 5 PM

Max Marks: 70

Q1. Choose the most appropriate option for each question. [8]

- i. 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
- ii. CGI and CGM have been developed to overcome the limitations of _____.
a. Open GL b. PHIGS c. GK d. GKM
- iii. In _____ type of 2-D geometric transformation, the shape of object always changes.
a. Rotation b. Scaling c. Shear d. Reflection
- 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. The television industry uses _____ color model.
a. CMY b. YCbCr c. RGB 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. 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
- 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. Briefly explain bitmap fonts.
- ii. Draw the structural diagram of raster scan CRT monitor.
- iii. What is odd-even rule to test position of a point regarding polygon?
- iv. Draw the 2D viewing transformation pipeline.
- v. List methods of text clipping. Give example of any one of them.
- vi. List out the features of PNG file format.
- vii. List out the basic components of sound card with its uses.
- viii. How many bits will require for storing a 16 bit sound system, recording signals at 44 KHz in stereo recording for 1 minute?
- ix. 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.
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.
b. Answer the following questions:
i. Write the steps to convert color value in YCbCr color model to RGB color mode.
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 5×5 . [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 3×3 neighbourhood using median filter. [6]

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]

Sardar Patel University
Master of Computer Application
SEMESTER - V Examination
PS05CMCA04: Computer Graphics
26th November 2015

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

Marks: 70

[6] Q1. Choose the most appropriate option for each question. [8]

- i. _____ is the time required for a single data element to pass from the beginning to the end of the pipeline.
A. Latency B. Throughput C. Modularity D. Durability
- ii. Which of the following is not a line attribute?
A. Line type B. Line width C. Line color D. None of above
- iii. _____ Algorithm is used to repaint areas so that the fill color is combined with the background colors.
A. Flood fill B. Boundary fill C. Tint fill D. Area fill
- iv. In _____ type of 2-D geometric transformation, the shape of object always changes.
A. Rotation B. Scaling C. Shear D. Reflection
- v. The CD-ROM drive with 48X has data transfer rate _____.
A. 7200 KB/Sec B. 7800 KB/Sec C. 72000 KB/Sec D. None of given
- vi. The photo receptor cells _____ are responsible to identify appearance of the object.
A. Cones B. Rods C. Rods and Cones both D. None of given
- vii. The _____ file format allows to store an animation sequence.
A. TIFF B. PNG C. JPG D. None of given
- viii. The _____ takes image as input and gives measurements as output.
A. Image Processing B. Image Analysis C. Image Understanding D. None of given

[6] Q2. Answer the following questions (Any seven): [14]

- i. Differentiate between track ball and space ball.
- ii. Explain Bitblt and Pixblt in brief.
- iii. What is odd-even rule for inside outside test for a given point with respect to polygon?
- iv. Explain blobby object with suitable example.
- v. Write a short note on bitmap fonts.
- vi. Write about approaches used to classify the visible surface detection methods.
- vii. List out the steps of actual development (Phase-II) of 3-Dimensional animation.
- viii. List out the different authoring methodology.
- ix. How many bytes will required to store a 16 bit sound system, recording signals at 44 KHz in stereo?

Time: 11:00 AM to 02:00 PM

Max Marks: 70

Q1. Choose the most appropriate option for each question.

[8]

- Full form of GKS is _____
 - a. Graphical Kernel System
 - b. Generalized Kernel System
 - c. Graphical Kernel Synchronization
 - d. Generalized Kernel Synchronization
- The function which is used to create and draw the output primitive on the screen, is called _____ function
 - a. Output
 - b. Input
 - c. Drawing
 - d. Primary
- Which of the following is not a dimension in context of 3D
 - a. Height
 - b. Depth
 - c. Width
 - d. Time
- _____ table contains pointers back into vertex table to identify the vertices of each polygon edge.
 - a. Edge
 - b. Vertex
 - c. Polygon
 - d. Data
- The photoreceptor cells called _____ are responsible for color identification of the object.
 - a. Fovea
 - b. Rods
 - c. Cones
 - 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 Video industry uses _____ color model.
 - a. CMY
 - b. YCbCr
 - c. RGB
 - d. None of given
- CD-ROM drive having 48X, indicates that the data transfer rate for it is _____.
 - a. 7800 KB/sec
 - b. 5200 KB/sec
 - c. 150 KB/sec
 - d. None of given

Q2. Answer the following questions (Any seven):

[14]

- What are pros and cons of beam penetration method for colour generation on CRT monitor?
- What is odd-even rule for determining inside or outside region?
- Briefly explain the importance of normalized viewing coordinates in display on screen.
- Differentiate: PHIGS and PHIGS+.
- What is blobby object?
- List out the features of PNG graphics file format.
- How many bytes will require for storing a 32 bit sound system, recording signals at 44 KHz in mono recording for 1 minute?
- Write the steps to convert the color value given in RGB color model to YIQ color model.
- Define Pseudo coloring & Multi-modal image processing.

Q3. Answer the following questions: [6]
A. What is Computer Graphics? Briefly explain application areas of computer graphics.

- B. Write a note on random scan display. [6]
- OR

B. Write steps of DDA line drawing algorithm. [6]

Q4. Answer the following questions: [6]

- A. Explain Cohen – Sutherland line clipping algorithm by giving suitable example. [6]
- B. What do you mean by text clipping? Explain different types of text clipping. [6]

OR

B. Explain back face detection of 3D objects. [6]

Q5. Answer the following questions: [6]

- A. Explain briefly the different stages of Image processing and analysis system by diagram. [6]
- B. Do as directed. [6]

- i. Explain briefly the main characteristics to design multimedia text.
ii. Define: Splicing,, Texture Mapping & Image Analysis. [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 5×5 . Sharpen the centre pixel $g(2,2)$, which is undefined using Laplacian derivative operator using 8-connectivity & 4-connectivity. [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 |

Q6. Answer the following questions:

- A. Write the steps to develop multimedia project. [6]
- B. i. Write the steps to convert CMY color value in YCbCr model. [6]
- ii. Write short note on types of Authoring methodology with example(s). [6]

OR

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, having i -th gray level in the input and the output image. Let N_i and N'_i are the number of pixel image. [6]

| | | | | | | | | |
|-------|---|---|-----|-----|-----|-----|-----|---|
| i | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| N_i | 0 | 0 | 120 | 130 | 140 | 150 | 160 | 0 |

&&&&

Q1. Choose the most appropriate option for each question.

[8]

- [6] i. In _____, scan display systems, picture definition is stored in _____
 A) Frame buffer B) Refresh buffer C) Both A and B D) None of these

[6] ii. Bean penetration method can generate maximum _____ number of colors on screen.
 A) 16 B) 256 C) 8 D) 16

[6] iii. In Cohen-Sutherland line clipping algorithm, bit 1 in region code represents _____ position.
 A) Left B) Right C) Above D) Below

[6] iv. Which of the following method of 3-D object projection is followed by human eye?
 A) Parallel projection B) Perspective projection C) Depth queuing D) Vibrating mirror

[6] v. _____ 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

[6] vi. The Video industry uses _____ color model.
 A) CMY B) YCrCr C) RGB D) None of given

[6] vii. CD-ROM drive having 48X, indicates that the data transfer rate for it is _____
 A) 7800 KB/sec B) 5200 KB/sec C) 150 KB/sec D) None of given

[6] 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):

 - What is odd parity rule?
 - List any four attribute of line.
 - What is bitblt?
 - Differentiate between delta delta and in-line shadow mask methods.
 - What is back face detection?
 - Define: Pseudo-color processing, Trimming
 - State the features of GIF graphics file not supported by PNG.
 - Explain briefly the main components of Image Processing and Analysis system.

Write about components of sound card.

Q3. Answer the following questions:

- a. List application areas of computer graphics. Explain any two of them. [6]
- b. Write a note on graphics software standards.

OR

- b. Write steps of Bresenham's line drawing algorithm.

Q4. Answer the following questions:

- a. Write a note on Sutherland-Hodgeman polygon clipping algorithm. [6]
- b. Explain the different methods of managing polygon surfaces.

OR

- b. List different 3-D Geometrical transformations. Explain any two of them.

Q5. Do as directed.

- a. Explain the image digitization process in detail..
- b. Explain briefly the different stages of image processing and analysis system.

OR

- b. Define animation and write the steps to develop 3-dimensional animation.

Q6. Do as directed.

- a. Write short note on multimedia project development process.

- 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.

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

OR

- b. Explain in detail the features of authoring package.

OR

[6]

[101/A-14]

No. of Printed Pages : 02

Sardar Patel University

Master of Computer Application

SEMESTER – V Examination

PS05CMCA24: Computer Graphics

23rd November, 2019, Saturday

Time: 02:00 PM to 05:00 PM Max Marks: 70

Q1. Choose the most appropriate option for each question. [8]

- i. In Bresenham's line algorithm, if the distances $d_1 < d_2$ then decision parameter P_k is _____.
a. Positive b. Equal c. Negative d. Option a or c
- ii. The Cartesian slope-intercept equation for a straight line is
a. $y = x \cdot x + b$ b. $y = b \cdot x + m$ c. $y = m \cdot x + b$ d. None of given
- iii. Line cap is obtained by adjusting the end positions of the component parallel lines so that the thick line is displayed with square ends that are perpendicular to the line path.
a. Projecting square b. Butt c. Round d. None of given
- iv. _____ table contains pointers back into vertex table to identify the vertices of each polygon edge.
a. Polygon b. Vertex c. Edge 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. The television industry uses _____ color model.
a. YIQ b. YCbCr c. CMY d. None of given
- vii. The process of blocking selected portions of the image for a particular editing operation is known as
a. Masking b. Dithering c. Splicing d. None of given
- viii. The process of assigning different color to every intensity value available in a grayscale image is known as _____ processing.
a. Multi-spectral b. Pseudo coloring c. False coloring d. None of given

Q2. Answer the following questions (Any seven): [14]

- i. Differentiate: Random Scan & Raster Scan
- ii. List out the method to generate font and explain one of them briefly.
- iii. Differentiate: LED Display & LCD Display.
- iv. Differentiate clearly parallel projection and perspective projection.
- v. Define Image Restoration and Splicing.
- vi. Define multimedia and list out its facets.
- vii. State the features of PNG file format.
- viii. State the authoring methodology used by following authoring tools: Macromedia director and Authorware.
- ix. List out at least two application areas with at least 2 applications for image processing & analysis.

Monday

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Q3. Answer the following questions:

- a. Write the steps to draw circle using Midpoint Circle Algorithm. [6]
b. Explain briefly the shadow-mask method to display the color on CRT monitor. [6]

OR

- b. What do you mean by inside-outside test? Explain briefly the odd-even rule. [6]

Q4. Answer the following questions:

- a. List out different geometric transformation and explain any two of them with example. [6]
b. Write short note on visible surface detection algorithm. Explain Depth-buffer method. [6]

OR

- b. Explain briefly the 3-D viewing pipeline. [6]

Q5. Answer the following questions:

- a. Define Image processing & Analysis and explain briefly the different stages of it. [6]
b. List out the different types of audio cards and write short note on any one of them. [6]

OR

- b. Explain briefly the steps to design multimedia project. [6]

Q6. Answer the following questions:

- 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 5×5 . Smooth the centre pixel $g(2,2)$, which is underlined in 3×3 neighborhood using: Mean filter and median filter. [6]

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|---|---|----------|---|---|
| 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 |

- b. Define animation and explain briefly the steps to generate 3-D animation.. [6]

OR

- b. Do as directed. [6]

- Write the steps to convert YCbCr color value in CMY.
- List out the different categories of animation.

G H Patel Post Graduate Department of Computer Science and Technology
Master of Computer Applications (MCA)
Sem – V Internal Examinations
PS05CMCA24 (Computer Graphics)
Friday, 27th September, 2019

Time: 11:00 AM to 12:30 PM

Max. Marks: 30

Q-1 Choose the most appropriate option for each question:

- a. Random scan monitors draw a picture one line at a time and are also referred to as _____

 - a) Vector displays
 - b) Stroke-writing
 - c) Calligraphic displays.
 - d) All of the above

b. _____ is used to select a particular character to be the marker symbol.

 - a) setMarkerType(mt)
 - b) setMarkerType()
 - c) setPolyMarkerType(mt)
 - d) None of these

c. CD-ROM drive having 48X, indicates that the data transfer rate for it is

 - a) 7800 KB/sec
 - b) 5200 KB/sec
 - b) 150 KB/sec
 - d) None of given.

d. The _____ file format allows to store an animation sequence.

 - a) JPG
 - b) PNG
 - c) TIFF
 - d) None of given

Q-2 Answer the following questions: (Any Five)

- [10]

- a. List and explain any two application of Computer Graphics
 - b. Define the following: 1) Output Primitives 2) Viewing transformations
 - c. List all the line joins and explain any two in brief.
 - d. Define : Dithering, Splicing
 - e. Explain briefly the main components of Image Processing and Analysis system.
 - f. Write the steps to design multimedia text.

Q-3 Answer the following questions:

- a. Write the steps of DDA algorithm. Illustrate the steps of DDA algorithm with by taking endpoints (20,10) and (30,18).
b. Explain shadow masking used in coloured CRT monitors in detail.

OR

c. Write a short note on Rotation transformation at origin and at any random point (x_r, y_r)

Q-4 Answer the following questions:

- a. Answer the following questions:

 - Write the steps to convert color value in RGB to YIQ .
 - Explain briefly the image digitization process.

b. Define animation and write the steps to develop 3-dimentional animation.

OR

b. Write short note on multimedia project development process.