

(98/A-24)

SEAT No. _____

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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
(i) while keeping C(5,2) fixed (ii) with respect to origin. [6]
- 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: [6]
- Write the steps to convert color value in YCbCr color model to RGB color model.
 - Explain briefly the pitfalls that can occur during digital recording with reason.

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	<u>7</u>	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.

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

OR

- b. Answer the following questions: [6]

- Explain briefly the image digitization process.
- Define: Dithering, Image Restoration and Image Analysis.