

Total No. of printed pages = 3

MCA 182305

Roll No. of candidate

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M.C.A. 3rd Semester End-Term Examination

COMPUTER GRAPHICS AND MULTIMEDIA

(New Regulation (w.e.f. 2017-18) & New Syllabus (w.e.f. 2018-19))

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks
for the questions.

Answer question No. 1 and any *four* from the rest.

1. Answer the following questions :

(10 × 1 = 10)

(i) Each bit represent

- (a) One color
- (b) Two color
- (c) Three color
- (d) Four color

(ii) Which of the following equation is used in 2D translation to move a point (x, y) to the new point (x', y') ?

- (a) $x' = x - t_x$ and $y' = y - t_y$
- (b) $x' = x + t_x$ and $y' = y - t_y$
- (c) $x' = x + t_x$ and $y' = y + t_y$
- (d) $x' = x + t_y$ and $y' = y - t_x$

(iii) The intersection of primary CMYK color produces _____.

- (a) White color
- (b) Magenta color
- (c) Black color
- (d) Cyan color

[Turn over

- (iv) What happens if the values of scaling factors s_x and s_y less than 1 (i.e., $s_x < 1$ and $s_y < 1$)?
- Increase the object's size
 - No change in the object's size
 - Decrease the object's size
 - Point Object
- (v) Which types of lines are used to transform coordinate points to the view plane in parallel projection?
- Intersecting Lines
 - Parallel Lines
 - Perpendicular Lines
 - Bisecting Lines
- (vi) Which type of parallel projection has projection vectors not perpendicular to the viewing plane?
- Oblique Projection
 - Cabinet Projection
 - Axonometric Projection
 - Perspective Projection
- (vii) Which of the following uses the Beam penetration method?
- Raster Scan
 - Random Scan
 - Both (a) and (b)
 - None of these
- (viii) Reflection of an object is same as rotation with angle
- 45 degree
 - 90 degree
 - 180 degree
 - 360 degree
- (ix) The region code 0000 represents the _____
- Viewing window
 - Left clipping window
 - Right clipping window
 - Bottom clipping window
- (x) When projection lines are perpendicular to the view plane then such type of projection is called
- Parallel
 - Perspective
 - Orthographic
 - Oblique

2. (a) What do you mean by pixel? (2)
- (b) What is resolution? Which factors influence the resolution? (2+2=4)
- (c) What is computer graphics? What are the different categories of computer graphics? (3)
- (d) Applying a 2D rotation followed by a scaling transformation is same as applying first the scaling transformation and then rotation—Justify. (3)
- (e) How can you differentiate Raster-scan and Random-scan display? (3)

3. (a) Generate the Bresenham's line drawing algorithm for generating a line. (8)
- (b) Using Bresenham's line drawing algorithm digitize a line whose end point are (20,10) and (30,18). (7)
4. (a) Prove that two successive translation is additive. (5)
- (b) Find the transformation matrix for the reflection about the line $y = -x$. (5)
- (c) What is homogeneous co-ordinate system? Why is it needed? (5)
5. (a) Why projection is required ? What are its various types? Explain. (2+2+6=10)
- (b) What is the advantage of using A buffer method over Z buffer method? Explain the working principle of A buffer method. (5)
6. (a) Derive the window-to-view port transformation equation by first scaling window to the size of the of the view port and then translating the scaled window to the view port position. (7)
- (b) Write an algorithm to clip a polygon against a rectangular window. Explain with a suitable example. (8)
7. (a) Differentiate between lossy and lossless compression. (5)
- (b) What is animation? How many frames does a 30-second animation film sequence with no duplication require? (2+3=5)
- (c) What are the various types of graphic image formats? What do you mean by grayscale image? (2+3=5)