MASTER OF COMPUTER APPLICATION
THIRD SEMESTER (SPECIAL REPEAT)
COMPUTER GRAPHICS
MCA-304.1
[USE OMR SHEET FOR OBJECTIVE PART]

SET A

Duration: 3 hrs.

Full Marks: 70
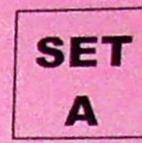
Objective

Time: 30 mins.

Marks: 20

Choose the correct answer from the following: $1 \times 20 = 20$

1. Classically, the pixel at the lower left corner of the image to be at the origin:
   - a. (1, 0)
   - b. (0, 1)
   - c. (0, 0)
   - d. (1, 1)

2. Resolution means:
   - a. Number of pixels per unit length in the vertical as well as in the horizontal direction
   - b. Length by width
   - c. Width by height
   - d. All of these

3. What does an aspect's ratio mean?
   - a. Number of pixels per unit length
   - b. The ratio of the width to height number of pixels
   - c. The ratio of the vertical to horizontal number of pixels
   - d. All of these

4. The term _____ refers to the display screen which is being updated and refreshed.
   - a. Aspect ration
   - b. Refresh rate
   - c. Under scan
   - d. Overscan

5. Which of the following operation can be applied on a 3D object to move it along any axis from its original position?
   - a. Translation
   - b. Scaling
   - c. Rotation
   - d. All of these

6. The types of hidden surface removal algorithm are:
   - a. Depth comparison, Z-buffer. Back-face removal
   - b. Scan-line algorithm, priority algorithm
   - c. BSP method, area subdivision method
   - d. All of these

7. Which of the following is a part of the Cathode Ray Tube?
   - a. Control Electrode
   - b. Electron Gun
   - c. Focusing System
   - d. All of these

8. Which of the following is an input device that can be rotated in any direction by fingers or palm?
   - a. Mouse
   - b. Joystick
   - c. Track ball
   - d. Keyboard

9. What is the formula for calculating slope, m of a line?
   a. $m = dx/dy$
   b. $m = dy/dx$
   c. $Y = mx + c$
   d. All of these

10. The picture regions against which object is to clip is called as_____.
    a. Clip window
    b. World-co-ordinate
    c. Clipping candidate
    d. Clipped part

11. _____types of transformation are present in computer graphics.
    a. 5
    b. 3
    c. 8
    d. 6

12. Which of the following is not a hidden surface algorithm?
    a. Z-buffer
    b. Painter's algorithm
    c. Scan-line algorithm
    d. Sutherland-Hodgeman algorithm

13. Transformation of objects shape from one form to another is called:
    a. Projection
    b. Morphing
    c. Clipping
    d. All of these

14. Which of the following is not the basic rule of animation?
    a. Squash and stretch
    b. Slow-in and slow-out
    c. Scaling
    d. Maintaining 3D affect

15. Which of the following is an image compression technique?
    a. Hidden surface algorithm
    b. Run length encoding
    c. Region filling
    d. Boundary-fill algorithm

16. If a point (x, y, z) is to be translated by an amount dx, dy and dz respectively, then what will be the value of the new translated points $(x1, y1, z1)$?
    a. $x1 = x, y1 = y, z1 = z$
    b. $x1 = dx, y1 = dy, z1 = dz$
    c. $x1 = x + dx, y1 = y + dy, z1 = z + dz$
    d. $x1 = x - dx, y1 = y - dy, z1 = z - dz$

17. The refresh rate to avoid flicker should be at least:
    a. 15 times per second
    b. 20 times per second
    c. 25 times per second
    d. 30 times per second

18. The corners of ....are defined with reference to the world coordinate origin.
    a. A window
    b. A view-port
    c. A graphic pipeline
    d. An image

19. In case of color display, ...number of electron guns is used inside the CRT.
    a. One
    b. Two
    c. Three
    d. Four

20. Random-scan display processor must execute its program........... in order to provide a flicker-free display.
    a. 20 to 30 times per second
    b. 25 to 30 times per second
    c. 30 to 60 times per second
    d. All of these

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(Descriptive)

[Answer question no.1 & any four (4) from the rest]

1. Discuss the following input devices briefly – Mouse, Joysticks,   6+4=10
   Trackball. Explain the following output devices in short – monitor,
   projector.

2. Explain the working principle of a monochromatic display monitor and   7+3=10
   a color display. Explain briefly the random-scan display processor.

3. a) Write the midpoint line scan-conversion algorithm.   5+5=10
   b) Discuss the Run Length Encoding image compression technique.

4. Write the matrix for two dimensional transformations of rotation,   3+7=10
   scaling and translation. Magnify the triangle with vertices A(0,0), B(1,1)
   and C(5,2) to twice its size while keeping C(5,2) fixed.

5. What is polygon clipping? Explain Sutherland–Hodgeman Polygon   3+7=10
   clipping algorithm.

6. a) What do you mean by image processing? Explain.   2+5+3=10
   b) Write the steps for designing any animation sequence. What are the
      three basic rules for animation?

7. Write the integer midpoint circle scan–conversion algorithm. Generate   7+3=10
   the pixels for first quadrant taking radius as 17 with this algorithm.

8. a) Find the perspective projection onto the view plane $z = d$ where the   5+5=10
      center of projection is the origin (0,0,0).
   b) Find a normalization transformation from the window whose lower
      left corner is at (0,0) and upper right corner is at (4,3) onto the
      normalized device screen so that aspect ratios are preserved.

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