Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **17CS2030** | **Duration :** | **3hrs** |
| **Sub. Name :** | **COMPUTER GRAPHICS** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Differentiate raster graphics and vector graphics. | CO1 | 5 |
| b. | Explain the two dimensional transformations and apply those transformations to the object positioned at (50,100) as per the following with neat sketch.   * Scale the object with ( Sx=2, Sy=0.5). * Translate the object 20 in x direction and 25 in y direction. * Rotate the object with 45 degrees. * Shear the object with (Sx=1, Sy = 0). | CO5 | 15 |
| **(OR)** | | | | |
| 2. | a. | Discuss about basic two dimensional geometry objects with neat sketch. | CO1 | 10 |
| b. | Write a Java 2D graphics program to draw the following design using GeneralPath class. | CO2 | 10 |
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| 3. | a. | Illustrate the working of Cohen Sutherland line clipping algorithm and apply the algorithm to clip the lines P1 to P2 and P3 to P4 where P1=(140,45), P2=(100,60), P3=(20,50), P4=(60,10) and the window size is given by (30,40,120,90). | CO4 | 10 |
|  | b. | Describe the following color models with suitable diagram and applications.   * CMY model * CMYK model * HSL model * HSV model * YIQ model | CO6 | 10 |
| **(OR)** | | | | |
| 4. | a. | Explain Bresenham’s line drawing algorithm and trace the algorithm for the given points (2,1) to (10,12) with proper steps and diagram. | CO4 | 10 |
|  | b. | Discuss the different types of drawing thick lines with neat diagram. | CO4 | 10 |
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| 5. | a. | Elaborate on the following three dimensional object modelling techniques with proper examples.   * CSG Scheme * Freeform Surface |  | 10 |
|  | b. | Discuss the following projections in three dimensions and its further classifications with neat sketch.   * Parallel Projection * Perspective Projection | CO3 | 10 |
| **(OR)** | | | | |
| 6. | a. | Demonstrate the following three dimensional transformations for the polygon having four vertices located at A(20, 10) B(60, 10) C(60, 30) D(20, 30) with neat graphical representation.   * Rotation by 30 degrees with respect to z axis. * Translate the polygon by 15 units in x direction and 20 units in y direction. * Scale the polygon with Sx=3 and Sy=2 | CO5 | 12 |
|  | b. | Explain about Scene Graph in three dimensional graphics with examples | CO2 | 8 |
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| 7. | a. | Describe the principles of z-buffer algorithm in visible surface determination. | CO3 | 12 |
|  | b. | Discuss the the importance of priority algorithm in three dimensional projection. | CO3 | 8 |
| **(OR)** | | | | |
| 8. | a. | Indicate the significance of the following techniques in visible surface determination.   * Ray Casting * Back face culling | CO2 | 12 |
|  | b. | Explain the principles of 3D reflection and 3D shading with suitable examples. | CO2 | 8 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Describe the following special effects in Java 3D.   * Fog * Particle Systems * Sound Effects | CO2 | 10 |
|  | b. | Discuss the principles of stereoscopic viewing in three dimensional graphics. | CO2 | 10 |