TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
**Examination Control Division**
**2080 Baishakh**

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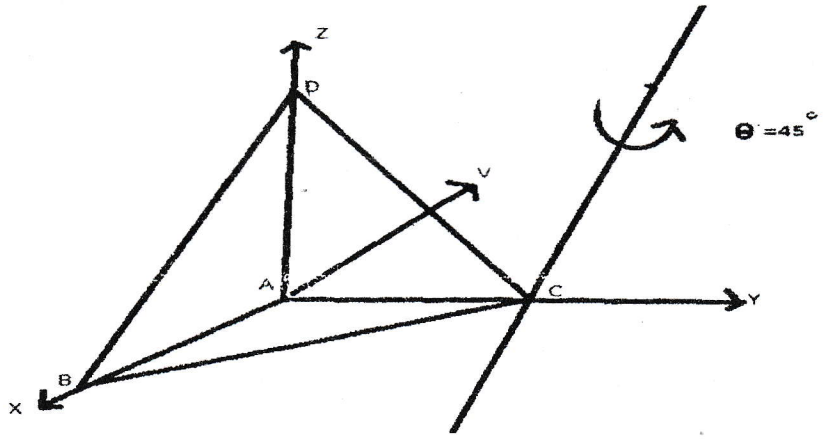
|---|---|---|---|
| **Exam.** | Back | | |
| **Level** | BE | **Full Marks** | 80 |
| **Programme** | BCT,BEX | **Pass Marks** | 32 |
| **Year / Part** | III / I | **Time** | 3 hrs. |

***Subject:*** - Computer Graphics *(Ex 603)*

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ *Assume suitable data if necessary.*



1. Define the terms pixel, resolution and pixel density. How much time is spent scanning each row of pixels during screen refresh on a raster system with resolution of 640×480 whose refresh is 24 frames per second? Also calculate the access time per pixel. [3+3]
2. Derive an expression for drawing on ellipse. [10]
3. Explain 2-D viewing pipeline. Obtain window to viewport transformation matrix with necessary steps and figures. Give example. [3+4+3]
4. The pyramid defined by the coordinate A(0,0,0),B( 1,0,0),C(0,1,0) and D(0,0,1) is rotated 45° about line L that has direction V = J + K and passing through the point C(0,1,0).Find the coordinate of the rotated figure. [8]




5. What is Bezier Curve? Find the coordinates of Bezier curve at u = 0.25, 0.5 and 0.75 with respect to the control points (10,15), (15,25), (20,35), (25,15) using Bezier Function. [2+6]
6. How do you represent an object in 3D? Explain the steps to find surface normal vector of a surface represented by Ax +By +Cz + D = 0. [4+4]
7. What is the limitation of Z- buffer method? How does A-buffer method overcome it? Explain. [2+6]
8. What is illumination model ? How light intensity of a point can be calculated? Also, discuss about the type of light source in intensity calculation. [2+6]
9. What is Phong Shading Model? Write down the algorithm for this shading model. Can we use this method to reduce Mach-Band effect? [2+4+2]
10. Write the importance of OpenGL in computer graphics. Write OpenGL syntax to draw a rectangle and polygon considering your own vertices. [6]

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