TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2076 Ashwin

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

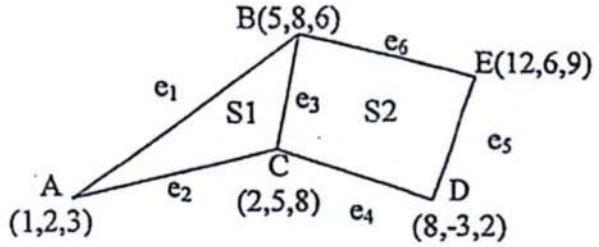
Subject: - Computer Graphics *(EX 603)*

- ✓ 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. Differentiate between raster and vector graphics. Calculate the frame buffer size (in KB) for a raster system recording a video for 1 min with resolution of 1280×1024, and storing 24 bits per pixel with a refresh rate of 25 fps. [2+4]
2. Explain the process of drawing ellipse in a raster graphics. Determine the pixel positions of following curve in first quadrant using mid-point algorithm. [4+6]

$$\frac{x^2}{64}+\frac{y^2}{36}=1$$

3. What do you mean by homogeneous coordinates? Rotate a triangle A(5,6), B(6,2) and C(4,1) by 45 degree about an arbitrary pivot point (3,3). [2+6]
4. List down the steps for rotating a 3D object by 90° in counter clockwise direction about an axis joining end points (1,2,3) and (10,20,30). Also derive the final transformation matrix. [10]
5. Mention two important properties of Bezier Curve and find the Bezier Curve which passes through (0,0,0) and (-2,1,1) and is controlled by (7,5,2) and (2,0,1). [2+6]
6. Represent the following surfaces by polygon table method and find the normal of surface S1. [2+5]



7. How hidden surfaces can be removed? Explain in detail about depth buffer methods. [8]
8. What is OpenGL? How pixels, lines and polygon is drawn and transformation is performed in OpenGL? [2+5]
9. List down different types of object and explain how Phong illumination model is used to calculate intensity in for these objects along with mathematical expression. [8]
10. Explain in detail about Phong shading. [8]

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