TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2081 Chaitra

Exam.	Regular (New Course)		
Level	BE	Full Marks	60
Programme	BEI,BCT	Pass Marks	24
Year / Part	II / I	Time	3 hrs.

Subject: - Computer Graphics and Visualization *(ENCT 201)*

- ✓ *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.*

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1. What is computer visualization? Calculate the frame buffer size for a raster system recording a video for 1 min with resolution of 1280 x 1024 and storing 24 bits per pixel with a refresh rate of 25 fps. [1+4]
2. a) How the decision parameter can be used to draw a Circle? Draw the circle with the radius 7 and centre (10,15). [2+5]
   b) Differentiate between boundary fill and flood fill Algorithm. [3]
   c) Use the Cohen-Sutherland line clipping algorithm to clip two lines $P_1(40,50)$ - $P_2(75,45)$ and $P_3(70,20)$ - $P_4(100,10)$ against a window A (50,10), B (80,10), C (80,40) and D (50,40). [4]
3. a) Suppose there is a rectangle whose coordinates are A(1,1), B(4,1), C(4,4), D(1,4) and the window coordinates are (2,2), (5,2), (5,5), (2,5) and the given viewport location is (0.5,0), (1,0), (1,0.5) , (0.5,0.5). Calculate the viewing transformation. [4]
   b) Write the steps required to rotate an object in 3D about arbitrary axis. Explain about the perspective projection. [5]
   c) Differentiate between Parallel Projection and Oblique Projection. [3]
4. Define spline curve. Explain Hermite curve for 3-degree polynomial with required expression. [1+4]
5. Why do you mean by back face detection? Explain the Z buffer method for visible surface detection in detail with its limitation. [1+4]
6. Explain the Phong shading algorithm. Mention the advantages of fast Phong shading overphong shading method. [1+4]
7. What is raster animation? Explain about motion specification in computer animation. [2+5]
8. Explain distributed scene rendering in brief. Differentiate between AR, VR and MR technology. [3+4]

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