Indian Institute of Engineering Science and Technology Shibpur
Department of Computer Science and Technology
BTech(CST),Departmental Elective-I, 5ᵗʰ Semester,
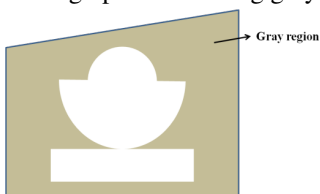**End semester examination, 2021**

Computer Graphics (CS-3121)

Full marks: 50   **Time**: $1\frac{1}{2}$ Hours + Uploading

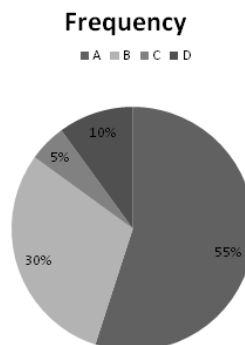**Read the following instructions carefully**

- *Answer any five questions.*
- ***Use appropriate diagrams*** *wherever desired.*
- *On the top of the answer script write Name of the Examination, Name of the Subject, Subject Code, Date of Examination, Name of the Student, Examination Roll Number, G-Suite ID and Number of Sheets uploaded.*
- *Before uploading scanned copy of answer script, rename it as your* ***examination roll number.pdf***

1. (a) Briefly discuss the following
       i) Frame Buffer   ii) Resolution   iii) Bit depth.
   (b) Discuss 'Scan line polygon fill' algorithm.

                                                                                    [6+4]

2. (a) Discuss with figure i)Orthogonal projection   ii)Perspective projection.
   (b) Discuss Z-buffer algorithm

                                                                                    [6+4]

3. (a) Discuss: i) World Coordinate   ii) Window   iii) Viewport
   (b) Show that window to viewport mapping obtained by 'normalization' and 'geometric transformation' yields identical result

                                                                                    [6+4]

4. (a) Derive parametric equation of a Bezier Curve.
   (b) Plot points of a quartic Bezier curve for at least 5 intervals of parameter range.

                                                                                    [6+4]

5. (a) Write an appropriate strategy for filling up the following gray region.

   (b) Following table is represented as pie chart. Discuss how can such pie chart be drawn using the table.

Entity	Frequency
A	55
B	30
C	5
D	10

                                                                                    [6+4]

6. (a) Derive the expression of illumination model of a scene. Mention each notations used in the expression. Update the expression considering the intensity attenuation and the transparency of the material.
   (b) Write a short note on ambient light.

                                                                                    [6+4]