

(3 Hours)

[Total Marks: 80]

- NB : 1) **Question 1 is compulsory.**  
 2) Attempt any **three** questions from the **remaining** questions.  
 3) **Assume** suitable **data** wherever applicable.  
 4) **Draw figures** wherever applicable.

- |   |  |    |
|---|--|----|
| 1 | (a) Explain different applications of computer graphics.   | 5  |
|   | (b) Explain different types of virtual reality systems.  | 5  |
|   | (c) Prove that two successive rotation are additive.   | 5  |
|   | (d) Explain fractals   | 5  |
| 2 | (a) Explain Virtual reality architecture.  | 10 |
|   | (b) Explain Bresenham's line drawing algorithm. Explain how it is different from DDA                               | 10 |
| 3 | (a) Find the Bézier curve given 4 control points (25,25), (45,40), (60,45) and (90,10) using the step size as 0.1. | 10 |
|   | (b) List various polygon filling algorithms and explain boundary fill in detail.                                   | 10 |
| 4 | (a) Explain geometric and kinematic modeling in detail   | 10 |
|   | (b) Explain Sutherland Hodgeman polygon clipping algorithm.  | 10 |
| 5 | (a) Explain 3D transformations with suitable example for each.   | 10 |
|   | (b) Explain Liang Barsky line clipping algorithm with example.   | 10 |
| 6 | Write short note on (any four)   | 20 |
|   | (a) Antialiasing techniques  |    |
|   | (b) Application of Virtual Reality   |    |
|   | (c) Text Clipping  |    |
|   | (d) VR toolkit   |    |
|   | (e) Morphing techniques  |    |