**(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.

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|---|---|---|---|
| Q1. | a | Explain the applications of virtual reality | 5 |
| | b | Explain parallel and perspective projections | 5 |
| | c | Explain the need for homogeneous matrix representation. | 5 |
| | d | Explain boundary filling and flood filling algorithm | 5 |
| Q2. | a | Explain Bresenham's line drawing algorithm. How it is different from DDA | 10 |
| | b | Define virtual reality. Explain the components of VR. | 10 |
| Q3. | a | Explain input and output devices used for virtual reality systems. | 10 |
| | b | Explain Sutherland Hodgeman polygon clipping. | 10 |
| Q4. | a | Define curve? How Bezier curve algorithm works? List out properties of the same. | 10 |
| | b | Explain graphics rendering pipeline. | 10 |
| Q5 | a | Explain 3D transformations i.e. translation, scaling, rotation, reflection with examples. | 10 |
| | b | Describe computer animation and the use of 2D and 3D morphing in it. | 10 |
| Q6. | | Write short notes on **(any four)** | 20 |

a. VRML
b. Color Models.
c. Fractals
d. Aliasing and Anti-aliasing
e. Text clipping

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