

(2½ Hours)

[Total Marks: 75]

- N. B.: (1) **All** questions are **compulsory**.  
 (2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.  
 (3) Answers to the **same question** must be **written together**.  
 (4) Numbers to the **right** indicate **marks**.  
 (5) Draw **neat labeled diagrams** wherever **necessary**.  
 (6) Use of **Non-programmable** calculators is **isallowed**.

- 1. Attempt any four of the following: 20**
- Explain in detail the Cartesian xy-plane
  - Write a short note on Theorem of Pythagoras in 3D.
  - Explain the following terms
    - Position Vectors
    - Unit Vectors
    - Cartesian Vectors
  - How Dot product helps in Back Face Detection?
  - Write a short note on 2D transformations.
  - Explain in detail GPU architecture.
- 2. Attempt any four of the following: 20**
- Explain rendering pipeline.
  - Write a short note on meshes.
  - Write a note on blending.
  - What is interpolation?
  - What is trigonometry and trigonometric ratio?
  - What is intersection point?
- 3. Attempt any four of the following: 20**
- What is Virtual Reality? Explain any two applications of it in detail.
  - What is Augmented Reality? Explain any two applications of it in detail.
  - What is Mixed Reality? Explain any two applications of it in detail.
  - Write a short note on Unity rendering engine.
  - Explain various unity essential component.
  - Explain the concept of scripting in unity.
- 4. Attempt any three of the following: 15**
- What is DirectX?
  - State the difference between update(), FixedUpdate() and LateUpdate() method in Unity script
  - Write a short note on Theorem of Pythagoras in 2D.
  - What is primitive topology?
  - Explain the following with respect to rendering
    - Mobile phones
    - Smart classes
    - HMD's
  - What are B-Splines?