

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 7 – EXAMINATION – SUMMER 2026

Subject Code: 3174905

Date: 01/06/2026

Subject Name: GAME DEVELOPMENT

Time: 02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Simple and non-programmable scientific calculators are allowed.**

- Q.1**
- (a)** Differentiate between 2D and 3D interactive games with suitable examples. **03**
 - (b)** Explain the role of a 'Game Avatar' in 3D graphics and its importance in player immersion. **04**
 - (c)** Discuss the various 3D transformations (Translation, Rotation, Scaling) used in game design. How are they represented mathematically? **07**

- Q.2**
- (a)** Define 'Core Mechanics' in game design. List any three core mechanics of a popular game. **03**
 - (b)** Explain the process of storyboard development for a narrative-driven game. **04**
 - (c)** Describe the principles of Level Design. What are the common challenges faced during the balancing phase? **07**

OR

- Q.2**
- (c)** Explain the iterative process of refining a game concept from the pre-production stage to the post-production stage. **07**

- Q.3**
- (a)** What is 'Occlusion Culling' in spatial sorting? Why is it critical for game performance? **03**
 - (b)** Compare and contrast Software Rendering and Hardware Rendering in game engines. **04**
 - (c)** Explain the importance of Collision Detection algorithms. Discuss any one algorithm used for detecting collisions between 2D objects. **07**

OR

- Q.3**
- (a)** What are the basic features of Game AI? How does it differ from traditional AI? **03**
 - (b)** Explain the concept of Pathfinding in games. Briefly describe the A* (A-Star) algorithm. **04**
 - (c)** Discuss the architecture of a typical Game Engine. Explain the role of the Rendering Engine and the Logic Engine **07**

- Q.4**
- (a)** List the primary panels in the Unity Editor and their specific functions. **03**
 - (b)** What are Unity Scripts? Explain the lifecycle of a MonoBehaviour script (Awake, Start, Update) **04**
 - (c)** Discuss the structure of a basic Pygame project. How does the 'Game Loop' function in Pygame? **07**

OR

- Q.4**
- (a)** Differentiate between Single-player and Multi-player game architectures in Unity. **03**

- (b)** Explain how mobile gaming platforms differ from PC gaming platforms in terms of resource management and input handling. **04**
- (c)** Describe the process of asset creation and management in Unity. What are Prefabs and how are they used? **07**

- Q.5**
- (a)** What is an 'Isometric View' in arcade games? Give examples of games that use this perspective. **03**
 - (b)** Explain the steps involved in incorporating music and sound effects into a game using the Pygame library. **04**
 - (c)** Discuss the implementation of Game Physics in interactive games. How do Rigidbody and Collider components interact? **07**

OR

- Q.5**
- (a)** Define 'Tile-Based' arcade games. Explain the advantages of using tiles for level design. **03**
 - (b)** Describe how Avatar creation is handled programmatically in a 2D interactive game. **04**
 - (c)** Develop a high-level pseudo-code or flowchart for a simple Puzzle Game developed using Pygame. **07**
