COMSATS UNIVERSITY ISLAMABAD, ABBOTTABAD CAMPUS
Department of Computer Science
Terminal Examination Fall 2023

Subject & Class:	*Game Development - BSE-7A/7B*	**Instructor:**	*M. Ibtisam Gul*	**Date:**	*12-Jan-2024*
Time Allowed:	*40 Minutes*	**Max marks:**	*40*		
Name:		**Reg #:**		**Sec:**	

---------- CLO – 1 ----------

1. Describe the role of GameObjects in Unity. How are they used in the game development process?
2. Explain the concept of render pipelines in Unity. How does the High Definition Render Pipeline (HDRP) differ from the Universal Render Pipeline (URP)? Provide examples of scenarios where each pipeline might be more suitable.
3. Explain the concept of encapsulation in C# and discuss its significance in game development. Provide a simple example using Unity scripts to demonstrate encapsulation.

---------- CLO – 2 ----------

4. What are the three main transformations controlled by the Transform component of a 3D GameObject in Unity? Provide a brief explanation of each.
5. Discuss the purpose of Particle Systems in Unity game development. Provide an example of a situation where using particle effects can significantly enhance the visual appeal of a game.
6. Explain the concept of Cinemachine in Unity and its role in enhancing camera functionality. Provide an example of a game scenario where Cinemachine can be beneficial.

---------- CLO – 3 ----------

7. What is ragdoll physics in Unity, and in what situations is it beneficial for character animations? Provide an example scenario.
8. Explain the concept of Animator Layers in Unity. How do they enhance the animation system. Provide an example scenario where using Animator Layers is beneficial?
9. You are developing a game where the player can control a robotic character with different modes, movement (forward, backward, left, right) and combat (kick and punch). Create an Animator Controller (State Machine Diagram) with appropriate states and transition to seamlessly transition between animations representing these distinct modes.

---------- CLO – 4 ----------

10. Create a ScriptableObject in named "PlayerData" that holds player information such as player name and score. Write code to access and display this information.
11. Provide line by line explanation of the following Method of 'Zombie' Script:

```
public void TriggerRagdoll(Vector3 force, Vector3 hitPoint)
{
  zombieHB.UpdateHealthBar(maxHealth, --currentHealth);
  if(currentHealth <= 0)
  {
    EnableRagdoll();
    Rigidbody hitRigidbody =
            ragdollRigidbodies.OrderBy(rigidbody => Vector3.Distance(rigidbody.position, hitPoint)).First();
   hitRigidbody.AddForceAtPosition(force, hitPoint, ForceMode.Impulse);
   _particleSystem.transform.position = hitPoint;
   _particleSystem.Play();
   currentState = ZombieState.Ragdoll;
  }
}
```

12. Provide line by line explanation of the following code:

```
using UnityEngine;
using System.IO;

[System.Serializable]
public class Player
{
  public string playerName;
  public int playerScore;
}

public class SaveLoadPlayerData : MonoBehaviour
{
  void Start()
  {
    Player player = new Player();
    player.playerName = "John";
    player.playerScore = 100;

    // Save player data to JSON file
    string json = JsonUtility.ToJson(player);
    File.WriteAllText("playerData.json", json);

    // Load player data from JSON file
    string loadedJson = File.ReadAllText("playerData.json");
    Player loadedPlayer = JsonUtility.FromJson<Player>(loadedJson);

    Debug.Log("Loaded Player Name: " + loadedPlayer.playerName);
    Debug.Log("Loaded Player Score: " + loadedPlayer.playerScore);
  }
}
```