



B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2024

(Regulation 2020)

Third Semester

MASTER OF COMPUTER APPLICATIONS

P20CAE0321: 3D Modelling and Game Design

COURSE OUTCOMES

- CO1:** Understand the foundational knowledge of 3D modelling and apply on a real time scenario in creating object and environment
- CO2:** Design and analyse the usage of Game objects and Assets using Physics and Lights
- CO3:** Apply Navigations, Particle systems and audio develop simple games

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

(Answer not more than 40 words)

- | | | |
|---|-----|-------------------|
| 1. Define a mesh, and how is it used in creating 3D models? | CO1 | [K ₁] |
| 2. Outline the process of scripting collision events in Unity and its role in game development. | CO2 | [K ₂] |
| 3. Compare directional lights and point lights in Unity, focusing on their effects and applications. | CO2 | [K ₂] |
| 4. Define a NavMesh Agent and explain its purpose in Unity navigation. | CO3 | [K ₁] |
| 5. Describe the purpose of UV mapping and explain its significance in applying textures to 3D models. | CO1 | [K ₂] |
| 6. Explain how polygon modeling and NURBS modeling differ in terms of structure and use cases in 3D design. | CO1 | [K ₂] |
| 7. Define a Collider and discuss its use in detecting collisions within Unity. | CO2 | [K ₁] |
| 8. List the various types of lights in Unity, and when would each type typically be used? | CO2 | [K ₁] |
| 9. Explain the use of Prefabs in Unity and how they help in managing game objects efficiently. | CO2 | [K ₂] |
| 10. Describe the difference between materials and textures in game development, and explain their respective roles. | CO2 | [K ₂] |

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

(Answer not more than 400 words)

- | | | | |
|--|-----|-----|-------------------|
| 11. a) What is 3D modeling, and how does it differ from 2D modeling? | (8) | CO1 | [K ₁] |
|--|-----|-----|-------------------|

- b) Identify the common types of 3D modeling techniques and describe their use cases. (8) CO1 [K₂]
12. a) Analyze the common challenges faced during the 3D modeling process and suggest possible solutions. (8) CO1 [K₄]
- b) Explain the term "topology" in the context of 3D modeling and discuss its significance in creating efficient models. (8) CO1 [K₂]
13. a) Demonstrate the use of default functions in Unity scripting, highlighting their advantages with examples. (8) CO2 [K₃]
- b) Compare Unity Hub and Unity Editor, focusing on their functions and how they facilitate game development. (8) CO2 [K₃]
14. a) Define Prefabs and explain their importance in efficient game development, including examples of common use cases. (8) CO2 [K₁]
- b) Outline the workflow for creating and using Prefabs in Unity, discussing their benefits for instancing and reusability. (8) CO2 [K₂]
15. a) Illustrate how collision detection works in Unity using Colliders and Triggers, providing practical examples. (8) CO3 [K₃]
- b) Analyze how scripting collision events can enhance gameplay mechanics in Unity, using code examples to support your explanation. (8) CO3 [K₄]
16. a) Discuss the steps involved in creating animations in Unity using the Animator and Animation components. (8) CO4 [K₂]
- b) Explain how animation controllers and blend trees are used to refine animations and ensure smooth transitions between states. (8) CO4 [K₂]
