

(Time:2 ½ Hours)

[Total Marks: 75]

- N.B.**
- 1) All questions are compulsory.
  - 2) Figures to the right indicate marks.
  - 3) Illustrations, in-depth answers and diagrams will be appreciated.
  - 4) Mixing of sub-questions is not allowed.

**Q. 1 Attempt ANY FOUR from the following: (20M)**

- (a) Write a short note on Parallel Projection.
- (b) Explain any five commonly used 3D modeling software tools. Briefly mention their key features and applications
- (c) Explain how the dot product is used in computer graphics to calculate the intensity of light on a surface. Support your answer with a suitable diagram or example.
- (d) Differentiate between Dot Product and Cross Product in vector mathematics. Give at least five key differences with suitable example.
- (e) Write a short note on Basic 2D Transformations. Explain with examples
- (f) Given a Square with coordinates (0,0),(0,2),(2,0),(2,2). Increase the Shape and Size of an object by 3 units in x direction.

**Q. 2 Attempt ANY FOUR from the following: (20M)**

- (a) Describe various components of Game Engine. How Game Engine is advantageous for game developers?
- (b) Explain the impact of Physics on game design.
- (c) Discuss various feature levels of Direct3D 11.
- (d) Write a note on Swap chain and page flipping in Direct3D 11.
- (e) How Pygame can be used as a Game development tool, explain.
- (f) What is the use of NumPy? Describe its various features in 2D and 3D.

**Q. 3 Attempt ANY FOUR from the following: (20M)**

- (a) Write a short note on Rect Transform.
- (b) Describe about the UI elements in Unity
- (c) Write in brief about Particle effects in Unity.
- (d) Explain the concept of multi scenes in Unity
- (e) Explain methods used for collision detection in Unity
- (f) Explain various input handling events in Unity.

**Q. 4 Attempt ANY FIVE from the following: (15M)**

- (a) State and Explain Lambert's Cosine law.
- (b) Explain any three - color models used in computer graphics. Describe their components and typical applications.
- (c) Describe any three gaming tools used by mobile game developers
- (d) What is COM? How it is used in game program coding?
- (e) Explain Game Object and Scene in Unity.
- (f) Explain Audio Source in Unity.

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