

(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) Explain in detail the different 2D transformations.
- (b) Discuss the concept of Shader Models.
- (c) Explain in detail Dot or Scalar product with suitable example.
- (d) A point has coordinates in the x, y, z direction i.e., (5, 6, 7). The translation is done in the x-direction by 3 coordinate and y direction 3 coordinates and in the z- direction by 2 coordinates. Shift the object. Find coordinates of the new position.
- (e) Define Quaternion. Explain addition and subtraction of two Quaternions.
- (f) Explain in detail culling and clipping.

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

- (a) Explain game engine architecture.
- (b) Write a short note on multisampling theory.
- (c) Discuss the `pygame.int()` and `pygame.display.set_caption()` functions in pygame with example
- (d) Explain the significance of texture and resource formats in DirectX.
- (e) Discuss 2D and 3D game development with MordenGL.
- (f) Describe Resource processing and File system in game engine.

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

- (a) Explain the concept of sprites.
- (b) Define game engine strategies when working with unity.
- (c) How Rigid body components are essential for creating realistic physics simulation in unity? Explain?
- (d) Explain about scripting collision events in unity.
- (e) Describe the overview of animation in unity.
- (f) Explain unity software interface in detail.

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

- (a) How to calculate 2D areas.
- (b) Write a short note on depth buffering.
- (c) Define class in unity with example.
- (d) Describe the steps in perspective projection.
- (e) Write advantages and disadvantages of game engine.
- (f) Explain conditional statement in unity.

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