B.E. (FT) END SEMESTER EXAMINATIONS – NOV / DEC 2024

Computer Science and Engineering
Seventh Semester
CS6026 – GAME DEVELOPMENT
(Regulation 2018 - RUSA)

Time: 3 Hours   Answer ALL Questions   Max. Marks: 100

CO1	Implement simple 3D Graphics applications for Game development
CO2	Use core Game design principles for Game Design
CO3	Analyze Game Engine Architecture and rendering
CO4	Design Simple animations
CO5	Use tools like Unity for game design and development

PART - A (10 x 2 = 20 Marks)

Sl.No.	Questions	Marks	CO	BL
1.	Illustrate the rendering pipeline.	2	CO3	L1
2.	Compute the composite transformation matrix for: 3D rotation about X-axis by 90° CCW followed by 3D rotation about Y-axis by 90° CW.	2	CO1	L2
3.	How are textures created and used in CG applications?	2	CO1	L2
4.	Illustrate the concept of 'Game Play Mode'.	2	CO2	L1
5.	List the common categories of *Game challenges*.	2	CO2	L1
6.	Compare Games of progression vs. Games of emergence.	2	CO2	L2
7.	What is 'scan conversion'?	2	CO1	L1
8.	How is rendering Transparent 3D objects different from that of opaque objects?	2	CO3	L2
9.	What are 'portals' in a game?	2	CO2	L1
10.	Mention the different data structures commonly used to represent game worlds and objects in 2D/3D.	2	CO5	L1

PART – B (8 x 8 = 64 Marks)
(Answer any 8 questions)

Sl. No.	Questions	Marks	CO	BL
11.	Compute the transformation matrix that transforms a triangle from its initial position at [(2,2), (5,3), (3,5)], to a new position such that one of its vertices lies in the 3rd quadrant while the other two remain in the 1st quadrant and none of the vertices lie on the coordinate axes.	8	CO1	L2
12.	What are *Splines*? Describe the process of creating a simple spline and demonstrate with an example by computing any random position on the spline.	8	CO1	L2
13.	What is a lighting model? Present a discussion on one such popular model used in CG applications and games.	8	CO3	L1

14.	How are collisions handled in games? Present any popular method for handling collisions.	8	CO3	L1
15.	What is the need for 'scripted conversations' in a game? Write short notes on Design issues for Dialog trees with illustrations wherever necessary.	8	CO2	L2
16.	What is 'Level of Detail'? Present the techniques and strategies commonly adopted for implementation.	8	CO2	L1
17.	Describe the systematic process of creating a 2D/3D game using any typical game engine.	8	CO5	L2
18.	What do you know about *Mesh Modelling*? Present mesh model for the following 3D shape: Tetrahedron inscribed in a standard unit cube at origin, with vertices at [(1,1,1),(0,1,1),(1,1,0),(1,0,1)].	8	CO1	L2
19.	What is the need for balancing a game? Present the common techniques used for balancing a game.	8	CO2	L1
20.	What are the common *Core Mechanics* in Games? Write about any one of the mechanics with an example use case.	8	CO2	L1
21.	Derive the Perspective projection transformation matrix. Demonstrate with a simple example, how zoom-in and Zoom-out effects are achieved using this.	8	CO1	L2
22.	Discuss about the common application of the following animation techniques. ➢ Keyframe ➢ Skin and Bones	8	CO1	L1

PART – C (2 x 8 = 16 Marks)

Sl.No.	Questions	Marks	CO	BL
23.	Present the common techniques used for backface detection and culling in 3D graphics applications. Identify backfaces for the 3D shape described in Q.No. 18, when the lookAt point is chosen as the position (1,1,1) along the viewing direction from [(1,1,1) to (0,0,0)].	8	CO3	L3
24.	What is the use of AI in games? Describe with an example game scenario how AI is implemented in Games.	8	CO5	L3