Roll No. | | | | | | | | | | |

B.E. (FT) END SEMESTER EXAMINATIONS – NOV / DEC 2023

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

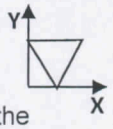
Time:3 Hours **Answer ALL Questions** **Max. Marks: 100**

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)

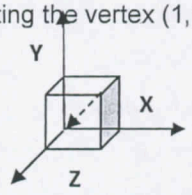
Sl.No.	Questions	Marks	CO	BL
1.	How is a viewing coordinate system setup in 3D?	2	CO1	L1
2.	Present the A* path finding algorithm.	2	CO3	L1
3.	What is 'Scan Conversion'?	2	CO1	L2
4.	How is a texture applied to a 3D model?	2	CO3	L2
5.	Present the structure of a Dialogue Tree.	2	CO2	L2
6.	What constitutes 'Game Play Mode'?	2	CO2	L1
7.	Identify the Dimensions of the Game Worlds.	2	CO2	L1
8.	Compare Games of Emergence and Games of Progression.	2	CO2	L1
9.	How is rendering a Transparent Cube different from that of the typical opaque cube?	2	CO3	L2
10.	What is Particle System animation?	2	CO4	L1

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

Sl. No.	Questions	Marks	CO	BL
11.	i) Compute the new position of a triangle [(2,0),(4,0),(4,4)], after scaling with respect to vertex (4,4) by scaling factors [2,-3], along x and y directions respectively.  ii) Present the 3D rotation matrices for rotation about the three coordinate axes and about any general axis in space.	4 4	CO1	L2
12.	Derive the Perspective Projection Transformation matrix and analyze the perspective effects of the matrix on any projection.	8	CO1	L2

13.	Write about the basic lighting and illumination models.	8	CO1	L1
14.	How would you relate *Skin and Bones* and *Inverse Kinematics* animation techniques? Discuss.	8	CO4	L2
15.	Write about the general types of challenges that most games offer.	8	CO2	L1
16.	What do you understand by Continuous *Level of Detail*? Summarize the steps of any popular algorithm for CLOD.	8	CO3	L1
17.	What is a *balanced* game? Summarize the different ideas and techniques used to ensure balance in a game.	8	CO2	L1
18.	What types of Core Mechanics are used in Games? Present an example for one of those mechanics.	8	CO2	L1
19.	How is *collision* detected between two objects? Present any simple algorithm for detecting collision between two convex polyhedra.	8	CO3	L2
20.	What is the need for clipping in CG applications? Present any simple clipping algorithm for clipping the shape shown against a standard clip rectangle. 	8	CO3	L2
21.	Illustrate the rendering pipeline and Present the Ray Tracing technique.	8	CO3	L1
22.	Identify the context of usage of the following modeling techniques • Mesh Modeling • spline based Modeling	8	CO1	L2

PART – C (2 x 8 = 16 Marks)

Sl.No.	Questions	Marks	CO	BL
23.	Present the core features of a typical *Game Engine* and describe the process of developing any simple game in 3D.	8	CO5	L3
24.	How are back-faces detected? Identify the back faces for a standard unit cube at origin as shown, when viewing direction is along the diagonal connecting the vertex (1,1,1) and (0,0,0). 	8	CO3	L3