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

B.E. (FT) END SEMESTER EXAMINATIONS – MAY / JUNE 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 3D viewing pipeline.	2	CO1	L1
2.	What types of textures are commonly used in 3D Graphics?	2	CO3	L2
3.	Define *Rendering* and mention an example algorithm.	2	CO3	L1
4.	Define 'Game Play' and illustrate the concept of 'Game Play Mode'.	2	CO2	L1
5.	What are the common categories of *Game challenges*?	2	CO2	L1
6.	List a few general *level design* principles.	2	CO2	L1
7.	What data structure is commonly used for Spatial Sorting in 3D?	2	CO3	L2
8.	Present any simple method for *Collision Detection*.	2	CO3	L2
9.	What are *sprites* and *Billboards*?	2	CO4	L2
10.	List the core features of a typical 3D Game Engine.	2	CO3	L1

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

Sl. No.	Questions	Marks	CO	BL
11.	How is rotation transformation performed in 2D and in 3D? Present the transformation matrices.	8	CO1	L2
12.	What are *Splines* and their types? How are they used in 3D graphics applications?	8	CO1	L2
13.	Write about the popular lighting models.	8	CO3	L1

14.	What is the role of AI in Games? Present any popular AI algorithm used in Games.	8	CO3	L1
15.	Describe any popular procedure to clip a simple triangle against a standard clip rectangle in 2D.	8	CO3	L2
16.	Present the relationship between core mechanics, storytelling engine and UI and write about the storytelling types.	8	CO2	L1
17.	i) Write about popular game genres and give an example for each. ii) Compare and contrast the process of designing Games of progression and games of emergence?	4 4	CO2	L1
18.	What do you know about *Mesh Modelling*? Describe the application of mesh modeling for smooth surfaces like Sphere, cylinder.	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 do you understand by *Core Mechanics* in Games? Write about any one of the mechanics with an example use case.	8	CO2	L1
21.	What is the need for backface culling in 3D Graphics? Present any simple method to detect and eliminate backfaces.	8	CO3	L2
22.	i) How is a viewing coordinate system setup in 3D? ii) How conversion between two coordinates systems in 3D is performed?	4 4	CO1	L2

PART – C (2 x 8 = 16 Marks)

Sl.No.	Questions	Marks	CO	BL
23.	Derive the Perspective Projection transformation matrix for transforming a standard unit cube at origin onto a view plane at z=10.	8	CO1	L3
24.	Write about the following animation techniques: ➢ *Skin and Bones* ➢ Particle Systems Discuss their application with an example game scenario.	8	CO4	L3