C–0164	Sub. Code
	82632

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023.

Third Semester

Game Programming

3D GRAPHICS PROGRAMMING

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. AABB

2. BSP Trees

3. 3D Particle effects

4. Ray casting

5. Sky Box

6. Cel shading

7. Shadow mapping

8. Rendering

9. Virtual trackball

10. Skinned mesh

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Discuss the process of using multiple texture maps for terrain textures.

Or

(b) What is a height texture map?

12. (a) Explain how a BSP Tree works.

Or

(b) What is a third-person camera?

13. (a) Explain the function of occlusion culling.

Or

(b) Describe the process in which the speed for the blender cycle can be improvised?

14. (a) Can you use multiple shaders at once in Minecraft?

Or

(b) Explain the problems associated with Gouraud shading?

15. (a) Discuss the four basic techniques of animation.

Or

(b) Elaborate the process of rendering to texture.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Discuss the importance of 3D graphics in films and advertisements.

Or

(b) What does the backface culling do in graphics?

17. (a) Explain why and how does anti alaising help in the process of rendering?

Or

(b) Enumerate the steps to optimize renders.

18. (a) What is skeleton animation data?

Or

(b) Discuss about specular lighting.

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C–0165	Sub. Code 82633

B.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

Third Semester

Game Programming

GAME NETWORKING TECHNIQUES

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Explain the basic difference between encoding and decoding.

2. Define network topology.

3. What are the various network types?

4. Define encryption.

5. What is hosting?

6. List the various types of network multiplayer games.

7. Define spawning.

8. What are the various remote actions?

9. What are the different callbacks in network?

10. Explain host migration.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) What a note on network basics and explain different topologies of network.

Or

(b) List the IEEE standards in networking and its functions.

12. (a) Explain different layers of OSI.

Or

(b) What is a firewall and what are its various types?

13. (a) Write a note on networking and communication concepts.

Or

(b) Explain local client and remote client in detail.

14. (a) Elaborate the process in setting up a network player in gaming.

Or

(b) Define RPC and explain the analogues in RPC.

15. (a) Explain the types of network protocol and discuss in detail.

Or

(b) Differentiate a network client and server with examples.

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Discuss in detail multiplexing, demultiplexing and the differences between them.

Or

(b) Explain the different types of networks with examples.

17. (a) Write a note on the various type of networks used for multiplayer games.

Or

(b) Define game state management in detail with examples.

18. (a) What is multiplayer lobby and explain the process involved on creation of lobby?

Or

(b) How will you perform host migration and list its advantages?

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C–0166	Sub. Code
	82634

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023

Third Semester

Game Programming

GAME ENGINE - I

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Explain screen dimension.

2. Differentiate model and rig in gaming.

3. What is the function of profiler window?

4. Define the purpose of mesh filter.

5. What is co-routines in gaming?

6. What are the types of colliders?

7. Define global illumination.

8. How will you check memory leak?

9. What are the elements in UI layout?

10. What is cleanup coding?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) What are the various differences between 2D and 3D model?

Or

(b) Explain the basic working process on 3D scene with different objects.

12. (a) What are the various input settings and how to do scripting?

Or

(b) Write a note on advantages of mesh filter and its applications.

13. (a) Explain in detail on Raycasting and Navigation.

Or

(b) Name and explain the different types of joins and colliders.

14. (a) What is GUI and explain the basics of cinematics?

Or

(b) How will you perform rendering and explain how render pases will be implemented?

15. (a) What are the various steps in designing game UI?

Or

(b) Write a note on building network for different platforms.

Part C $(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Discuss in detail the various steps in importing a model with examples.

Or

(b) Write a brief note on scripting and basic 3D methods.

17. (a) Explain Navigation and pathfinding with application scenarios.

Or

(b) Define camera properties in detail.

18. (a) What is networking and explain the different concepts involved?

Or

(b) Define terrain design and how will you design a level map.

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C–0168	Sub. Code
	82651

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023

Fifth Semester

Game Programming

GAME ENGINE - II

(2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Game Engine

2. What is User Interface?

3. Where is Vertex painting used?

4. List two software used in creating Prefab.

5. What are Blueprint variable types?

6. What is your understanding about UI animation?

7. What is a Health bar and Fuel bar?

8. Define memory optimization in gaming development.

9. What are popup messages?

10. How to cleanup blueprints?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) What are the transform tools used in Game Engine?

Or

(b) Write a brief description on importing custom static mesh.

12. (a) Write the importance of sound in building games.

Or

(b) How to create cinematic mesh? Discuss with examples.

13. (a) Explain the different blueprint variable types.

Or

(b) Explain the Floating UI Widget.

14. (a) Elaborate the concept Cascade VFX.

Or

(b) What is the importance of Game Count Down Timer? Discuss.

15. (a) Why is it necessary to create Enemy Bot AI?

Or

(b) What are the steps involved in creating the Flashlight?

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Discuss in detail the difference between structural meshes and unstructural meshes with real time examples.

Or

(b) Explain the steps in creating animated popup messages. Illustrate.

17. (a) Explain Speed Boost Ability and Gravity Boost Ability.

Or

(b) Create your own HUD design.

18. (a) What are the basic Gamepad inputs? Explain.

Or

(b) Explain the basic mechanism of Side Scroller Game.

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C–0169	Sub. Code
	82653

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023.

Fifth Semester

Game Programming

ARTIFICIAL INTELLIGENCE

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Finite state machine

2. Roaming AI

3. Behavioural AI

4. Chasing

5. Fuzzy Reasoning

6. K Strips

7. Artificial neural network

8. Shafer theory

9. Intelligent agent

10. Two types of knowledge acquisition

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) What are the types of Artificial Intelligence?

Or

(b) Enlist the search problems in artificial intelligence?

12. (a) How is artificial intelligence used in games?

Or

(b) What is the process of creating an Al Strategy?

13. (a) What are the four patterns of AI?

Or

(b) Explain deterministic and non-deterministic machines.

14. (a) Distinguish between forward chaining and backward chaining.

Or

(b) What are the main elements of the AT Production system?

15. (a) What are the characteristics of an intelligent agent?

Or

(b) Enlist the techniques of heuristic.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Discuss the four success attributes of an AI Project

Or

(b) What does a fuzzy approach indicate?

17. (a) How does machine learning support loT Roaming?

Or

(b) Artificial Intelligence is the future. Elaborate the statement giving your arguments.

18. (a) Differentiate between Game AI and AT.

Or

(b) Discuss the three stages of genetic algorithms.

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C–0170	Sub. Code
	82654

B.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

Fifth Semester

Game Programming

GAME PROGRAMMING PATTERNS

(2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Define Abstraction.

2. What is polymorphism?

3. Define singleton.

4. What is a Null Object?

5. Define Command.

6. What is a memento?

7. Define dirty flag.

8. What is a bytecode?

9. What is Spatial Partition?

10. What is a weapon system?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) What are the types of Design Patterns?

Or

(b) Explain abstraction, inheritance, encapsulation and Polymorphism.

12. (a) Explain the significance of creational design patterns.

Or

(b) Explain optimisation process.

13. (a) What is Power Up Management?

Or

(b) What is enemy movement pattern?

14. (a) Explain the difference between interpreter and iterator.

Or

(b) How are design patterns used in problem-solving?

15. (a) Explain structural design patterns.

Or

(b) What is double buffer? Explain.

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Explain the design patterns in games with examples.

Or

(b) Explain sequencing patterns.

17. (a) What is Proxy Behavioural Design Pattern? Explain.

Or

(b) Elucidate the differences between simple paddle and paddle with special power.

18. (a) How to identify the common factors in breakouts and space invaders?

Or

(b) Explain the use of Entity Component System.

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C–0171	Sub. Code
	82655C

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023

Fifth Semester

Game Programming

EMERGING TRENDS

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. What is virtual environment?

2. Define matrices.

3. Give the importance of quaternions in gaming.

4. What do you mean by transformations?

5. How to measure refraction of light?

6. What is motion perception?

7. Classify AR.

8. What is hybrid tracking?

9. What are the applications of IoT in gaming?

10. What is smart grid?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain the sensation and perception of bird-eye view.

Or

(b) Explain the birds-eye view software in detail.

12. (a) Explain the homogeneous transformation.

Or

(b) Write note on multiplying rotation.

13. (a) Explain the light intensity in detail.

Or

(b) Describe the motion perception.

14. (a) Explain the geometric verification.

Or

(b) Highlight the hybrid tracking.

15. (a) Explain the machine-to-machine communication.

Or

(b) Explain the neuro gaming.

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Describe the application of birds-eye software for game technology.

Or

(b) Describe the uses of birds-eye hardware for game technology.

17. (a) Describe the various types of sensors used in game technology.

Or

(b) Describe in detail the significance of game simulation in game model.

18. (a) Describe various approaches to feature extraction.

Or

(b) Describe the various communication protocols.

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C–1227	Sub. Code
	82613

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023.

First Semester

Game Programming

FUNDAMENTALS OF PROGRAMMING

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 1 = 10)$

Answer **all** questions.

1. Which of the following is not a common data type in most programming languages

   (a) Integer (b) String

   (c) Boolean (d) Loop

2. Which of the following is an example of a unary operator in programming?

   (a) Addition (+) (b) Subtraction (–)

   (c) Increment (++) (d) Multiplication (*)

3. What type of array is commonly used for representing tables and matrices?

   (a) One-dimensional array

   (b) Two-dimensional array

   (c) Multi-dimensional array

   (d) Dynamic array

4. What does it mean to pass a pointer to a function in C/C++?

   (a) To make a copy of the pointer within the function

   (b) To pass the address of a variable to the function

   (c) To return a pointer from the function

   (d) To allocate memory for the pointer

5. In OOP, what is a constructor used for?

   (a) To destroy an object and release its resources

   (b) To create an object and initialize its attributes

   (c) To change the access level of an object's members

   (d) To call a virtual function

6. What is abstraction in OOP?

   (a) The process of creating objects from classes

   (b) The act of bundling data and methods together

   (c) Hiding complex implementation details while exposing a simplified interface

   (d) The process of overriding base class methods in a derived class

7. What is the primary purpose of file handling in programming?

   (a) To format text for display on the screen

   (b) To handle exceptions and errors

   (c) To create templates for code reuse

   (d) To read and write data to and from files

8. Which of the following is not typically associated with delay and timer function programming?

(a) Creating time delays between operations

(b) Measuring the execution time of code

(c) Handling file I/O operations

(d) Implementing timeouts in network programming

9. Which STL container allows for constant-time insertions and deletions at the beginning and end of the container?

(a) Vector (b) List

(c) Deque (d) Stack

10. Which type of iterator in STL allows bidirectional traversal, meaning it can move both forward and backward through a sequence?

(a) Forward Iterator

(b) Random Access Iterator

(c) Bidirectional Iterator

(d) Data Structure Iterator

Part B $(5 \times 5 = 25)$

Answer **all** questions.

11. (a) Define the concept of data types in programming and describe the role of variables in storing data.

Or

(b) Differentiate between unary, binary, and ternary operators and provide examples of each.

12. (a) Explain with examples the concept of a one-dimensional array in programming.

Or

(b) Describe the concept of multi-dimensional arrays and their use cases in programming.

13. (a) Explain the concepts of classes and objects in object-oriented programming.

Or

(b) Describe the significance of constructors in OOP.

14. (a) Describe the key file handling operations in programming, including reading from and writing to files.

Or

(b) Describe how namespaces can be implemented to group related code.

15. (a) Explain the difference between containers and sequences in the STL.

Or

(b) Explain the significance of sorting algorithms in the STL.

Part C $(5 \times 8 = 40)$

Answer **all** questions.

16. (a) Discuss the significance of loops in programming and explain the difference between "for" and "while" loops.

Or

(b) Explain the concept of passing values (arguments) to functions in programming.

17. (a) Explain the syntax and the concept of array-to-pointer conversion.

Or

(b) Define pointers and their role in memory management. Explain how pointers store memory addresses and their advantages in various programming tasks.

18. (a) Discuss the various types of polymorphism and Explain with examples how they are implemented in OOP.

Or

(b) Explain the concept of virtual functions and dynamic binding in OOP. Discuss with examples how virtual functions enable runtime method binding?

19. (a) Describe the role of delay and timer functions in programming. Discuss with suitable example, how these functions can be used to control timing and create time delays in code execution.

Or

(b) Explain the primary purpose of data handling using files in programming. Discuss the steps involved in reading data from an external file and writing data to a new file.

20. (a) Explain what function objects (functors) are and their role in the STL. Provide examples of creating and using custom function objects and discuss their advantages.

Or

(b) Differentiate between forward and ramdom-access iterators in the STL. Provide examples of containers that use each type of iterator and discuss their specific use cases and limitations.

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C–1228	Sub. Code
	82615

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023

First Semester

Game Programming

GAME ANALYSIS AND DESIGN

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A $(10 \times 1 = 10)$

Answer **all** questions.

1. What does HCI stand for in the context of technology and design?

   (a) High-Caliber Integration

   (b) Human-Computer Interaction

   (c) Highly Configured Interface

   (d) Hyper-Connected Intelligence

2. In the context of game design, what is "orthogonality"?

   (a) The ability of a game to be played on various platforms

   (b) The impedance of game mechanics, where changes in one do not affect others

   (c) The alignment of game elements along a grid

   (d) The use of orthographic projections in 3D games

3. What is the primary social function of games in society?

(a) Entertainment (b) Education

(c) Competition (d) Communication

4. What concept describes the unexpected and emergent behaviors that result from the interaction of game mechanics and player choices?

(a) Progression (b) Strategy

(c) Emergence (d) Skill

5. What is a transmedia world in the context of game design?

(a) A virtual reality gaming environment

(b) A game world that spans multiple platforms and media

(c) A world created solely for tabletop role-playing games

(d) A world with non-linear gameplay

6. In game design, what is the nature of game characters within a world?

(a) Passive observers of the game world

(b) Static and unchanging entities

(c) Dynamic entities that interact with the world and the player

(d) Elements that don't impact game play

7. In game design, what does 'modelling" refer to?

(a) Creating 3D character models

(b) Building in- game landscapes

(c) Developing mathematical representations of game elements and interactions

(d) Designing game narratives

8. Which term refers to the rules and systems that govern a game's behaviour and interactions?

(a) Game space (b) Objects

(c) Attributes (d) Game mechanics

9. What is the purpose of player taxonomy in game design?

(a) To categorize players based on their skill level

(b) To create stereotypes of players

(c) To understand player preferences and behaviours

(d) To limit the diversity of player experiences

10. What is the role of psychographics in game design?

(a) Psychographics determine a player's level of skill

(b) Psychographics categorize players based on their demographics

(c) Psychographics analyse player's values, interests and behaviours

(d) Psychographics focus on the technical aspects of a game's design

Part B $(5 \times 5 = 25)$

Answer **all** questions.

11. (a) Explain the concept of new media and its impact on communication.

Or

(b) Explain the key milestones in the development of video games and the platforms that contributed to their growth.

12. (a) Explain the social function of games and how they contribute to human interaction and communication.

Or

(b) Explain the concept of a branching tree in game design and how it allows player choices to impact the storyline.

13. (a) Explain the concept of a transmedia world in game design.

Or

(b) Explain the difference between dynamic and static characters and their impact on player engagement.

14. (a) Describe the role of modelling in enhancing the player's experience in a game.

Or

(b) Discuss the significance of imagination in the gaming experience.

15. (a) Explain the concept of player taxonomy in game design.

Or

(b) Describe the consequences of unbalanced player interactions on the gaming experience.

Part C $(5 \times 8 = 40)$

Answer **all** questions.

16. (a) Explain three practical approaches to game design, such as player-centered design, iterative design, and playtesting.

Or

(b) Describe the different types of fun players can experience in games, such as challenge, fellowship, and exploration.

17. (a) Define gameplay and its role in the player's interactive experience. Discuss how chance and probability contribute to the unpredictability of game outcomes.

Or

(b) Discuss the process of adding and subtracting game mechanics during game development. Explain how this process can influence gameplay and player experiences.

18. (a) Define the concept of world aesthetics in game design. Explain the value of aesthetics in enhancing player immersion and emotional connection with the game world.

Or

(b) Explain how aesthetics can guide the design of a game world. Discuss how aesthetics influence the overall mood and style of the game.

19. (a) Differentiate between "attributes" and 'states' in game design. Explain how rules govern game elements. Provide examples of how attributes, states, and rules influence player interactions in games.

Or

(b) Discuss the methodologies used to balance a game's difficulty and mechanics. Explain how game economics, including in-game currencies and rewards, can influence game balancing.

20. (a) Describe the significance of player demographics in game design. What demographic factors are commonly considered in game development?

Or

(b) Explain the concepts of Ergodic, Code, and Osher laws of computer game design.

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