C–6015

Sub. Code
82613

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

First Semester

Game Programming

FUNDAMENTALS OF PROGRAMMING

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. A _____ is any characteristic, number, or quantity that can be measured or counted.

   (a) Variable (b) Array

   (c) Pointer (d) Looping

2. _____ loop is a sequence of instructions that is continually repeated until a certain condition is reached.

   (a) Variable

   (b) Array

   (c) Pointer

   (d) Looping

3. The array which contains only a single row of element is termed as.

(a) One dimensional array

(b) 2D Array

(c) 3D array

(d) Multi-dimensional array

4. _____ are a powerful data structure used to store and manage data organizationally.

(a) One dimensional array

(b) Two-dimensional array

(c) 3D array

(d) Multi-dimensional array

5. _____ is used to hide the values or state of a structured data object inside a class, preventing unauthorized parties' direct access to them.

(a) Encapsulation

(b) Constructors

(c) Destructors

(d) Polymorphism

6. _____ is a member function that is invoked automatically when the object goes out of scope or is explicitly destroyed by a call to delete or delete [ ].

(a) Encapsulation

(b) Constructors

(c) Destructors

(d) Polymorphism

7. _____ allows us to create a family of classes or family of functions to handle different data types.

(a) Arrays

(b) Templates

(c) Pointers

(d) Enumerations

8. _____ are treated as data types and you can use them to create sets of constants for use with variables and properties.

(a) Arrays

(b) Templates

(c) Pointers

(d) Enumerations

9. _____ is a procedure or formula used for solving a problem.

(a) Algorithm

(b) Vector

(c) Iterators

(d) Binary search

10. _____ is used to rearrange a given array or list of elements according to a comparison operator on the elements.

(a) Iterators

(b) Vector Algorithm

(c) Sorting Algorithm

(d) Mutating algorithm

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Summarize the role of inline and recursive functions with examples.

Or

(b) Enlist the roles of the following :

(i) Data types

(ii) Variables

(iii) Constants

12. (a) Enlist the various types of arrays.

Or

(b) Highlight the features of one- and two-dimensional arrays.

13. (a) Summarize on overriding and inheritance in programming.

Or

(b) Compare constructors and destructors

14. (a) Infer the role on read and write operations

Or

(b) Summarize the advantages and disadvantages of delay and timer functions.

15. (a) Explain in detail about data structure types.

Or

(b) Conclude the role of swap, remove, replace and its functions.

Part C

(5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) Enlist the functions of looping.

Or

(b) Summarize the role of Inline and recursive functions.

17. (a) Explain the role of pointers. State the advantages and disadvantages of the same.

Or

(b) Highlight the role of the following :

(i) passing pointers to functions

(ii) Passing arrays to functions

18. (a) State the role of polymorphism and its types.

Or

(b) Enlist on OOPS principles, classes and objectives.

19. (a) State the role of enumerations, delay and timer functions.

Or

(b) List the purpose of designing and structuring a project with suitable examples.

20. (a) Explain the role of algorithms, random number generator, iterators.

Or

(b) Highlight the role of standard template libraries used in programming.

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C–6016

Sub. Code
82615

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

First Semester

Game Programming

GAME ANALYSIS AND DESIGN

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. _____ framework is a tool used to analyse games

   (a) Mechanics- Dynamics- Aesthetics

   (b) Machine- Dynamics-Aesthetics

   (c) Manual- Dynamics-Aesthetics

   (d) Mechanics-Delay-Aesthetics

2. _____ allow you to affect an object's colour, texture, displacement, or any number of other properties according to the squash and stretch of its geometry.

   (a) Orthogonality

   (b) Tension maps

   (c) 3D array

   (d) Multi-dimensional array

3. _____ is played by solving physical puzzles in a standard platform game environment.

(a) Linear

(b) Braid

(c) Strategy

(d) Polymorphism

4. _____ which has infinite outcomes because the player's actions determine the next scene

(a) Virtual game play

(b) Integrating game play

(c) Progression- designed games

(d) Emergence game play

5. _____ is the process of creating a three-dimensional representation of a theme, setting, or mood within the game.

(a) Real architecture

(b) 2D Architecture

(c) Simulation architecture

(d) Virtual architecture

6. _____ are things that appear within a video game that contribute to the game play experience.

(a) Game aesthetics

(b) Game balancing

(c) Game elements

(d) Game methodology

7. _____ are templates for building modularised code that are generally a repeatable solution to a commonly occurring mechanic applied in computer games

(a) Attribute patterns

(b) Pattern inside patterns

(c) Skill Patterns

(d) Design Patterns

8. _____ refers to the mental attributes distributed among a group of people. In game studies, it usually refers to what different players like seeing and doing in a game

(a) Psychographics

(b) Ethics

(c) Taxonomy

(d) Dynamics

9. _____ player types are a classification of video game players according to their preferred actions within the game.

(a) Psychographics

(b) Ethics

(c) Taxonomy

(d) Dynamics

10. _____ concerns changing parameters in a game to avoid undesired player emotions, such as boredom and frustration

(a) Dynamic game balancing

(b) Balancing game economics

(c) Game balancing methodologies

(d) Taxonomy of players

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Enlist the role of human computer interaction fundamentals.

Or

(b) Summarize on Orthogonality and affordability.

12. (a) Enlist the role of branching tree and networks in gaming.

Or

(b) Highlight the features of linear and braided plot.

13. (a) Enlist the role of transmedia world and its properties.

Or

(b) Compare real vs virtual architecture.

14. (a) Infer the following

(i) Space objects

(ii) Attributes and states

Or

(b) Summarize on interest curves & pattern inside patterns.

15. (a) Explain in detail on ethical instances and communities.

Or

(b) Conclude the role of psychographics.

Part C

(5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) Summarize the evolution of games & explain the types of games.

Or

(b) Enlist the role of the following

(i) Ethics of new media and its importance

(ii) Tension maps in game design

17. (a) Mention the role of networks, adding and subtracting mechanics in gaming.

Or

(b) Highlight the role of the following :

(i) Emergence and progression in games

(ii) Integrating emergence and progression.

18. (a) State the role of aesthetics in gaming sector.

Or

(b) Summarize on balancing art and technology in gaming.

19. (a) State the role of game mechanics and its application.

Or

(b) List the purpose of game balancing methodologies and dynamic game balancing.

20. (a) Explain the features of ethics in game design.

Or

(b) Highlight the role of ergodic, code and other laws of computer game design.

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C–6019	Sub. Code 82633

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Third Semester

Game Programming

GAME ENGINE — I

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. Which of the following best differentiates 2D and 3D games?

   (a) 2D games use polygons, 3D games use sprites

   (b) 2D games are always top-down, 3D games are side-scrolling

   (c) 2D games are flat, 3D games have depth

   (d) 2D games require VR headsets

2. What is the primary role of a polygonal mesh in 3D game development?

   (a) It defines the lighting system

   (b) It controls camera angles

   (c) It represents the shape of a 3D object

   (d) It manages in-game physics

3. Which feature helps in creating a seamless game environment?

(a) Collision Detection

(b) Profiler Window

(c) Prefabs and Tags

(d) Importing Models

4. What is the primary function of the Profiler Window?

(a) To adjust terrain settings

(b) To analyze game performance

(c) To modify sound effects

(d) To change the UI layout

5. What is Raycasting mainly used for in 3D games?

(a) To control lighting effects

(b) To detect object collisions

(c) To enhance audio quality

(d) To manage networking

6. Which feature helps in controlling animations effectively?

(a) Coroutines (b) Prefabs

(c) Pathfinding (d) Mesh filter

7. What is Occlusion Culling used for?

(a) Optimizing event handling

(b) Reducing rendering of unseen objects

(c) Enhancing texture resolution

(d) Managing sound effects

8. What is the purpose of a GUI in a game?

(a) To manage memory allocation

(b) To provide an interactive user interface

(c) To implement server networking

(d) To modify shader properties

9. What does the term "Instantiate' refer to in game development?

(a) Creating a new game object at runtime

(b) Destroying an object in memory

(c) Loading an animation script

(d) Assigning a new texture to a mesh

10. Why is memory optimization important in game development?

(a) To reduce lag and crashes

(b) To increase the number of polygons

(c) To expand texture size

(d) To remove shadows from rendering

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the fundamental differences between 2D and 3D game development.

Or

(b) Describe the process of working with 3D Game Objects and their components.

12. (a) Discuss the importance of collision detection in 3D game environments.

Or

(b) Explain the concept of event handling in gaming and how it impacts user interaction.

13. (a) What is Raycasting in game development? Provide examples.

Or

(b) Explain the significance of animation in 3D games and how it enhances user experience.

14. (a) What are the different camera properties used in game development?

Or

(b) Explain the concept of Occlusion Culling and its role in game optimization.

15. (a) Discuss the key elements of designing a Game UI.

Or

(b) How does networking contribute to multiplayer gaming?

Part C (5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) Explain in detail the process of importing models and working with meshes in game development.

Or

(b) Discuss the significance of designing a game environment and its impact on user experience.

17. (a) Describe the process of handling frame rates and optimizing game performance.

Or

(b) Explain different types of joints in 3D physics and their applications.

18. (a) What is the importance of rendering and shading techniques in game development?

Or

(b) Discuss the role of memory optimization and event management in game performance.

19. (a) Explain the step-by-step process of building a game for different platforms.

Or

(b) Describe the role of sound and music in game development and how they enhance gameplay.

20. (a) What are the key networking concepts involved in multiplayer game development?

Or

(b) Explain the process of game UI development and how it contributes to user interaction.

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C–6021

Sub. Code
82636

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Third Semester

Game Programming

GAME NETWORKING TECHNIQUES

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Section A (10 × 1 = 10)

Answer **all** questions.

1. What is the function of a network hub in a computer network?

   (a) It connects computers without any data loss

   (b) It amplifies signals across the network

   (c) it forwards data to the correct destination

   (d) It provides network security

2. Which of the following is a commonly used encryption algorithm for data security in networks'?

   (a) AES (b) MD5

   (c) RSA (d) DES

3. Which device is responsible for connecting two or more different networks together?

(a) Switch (b) Hub

(c) Bridge (d) Router

4. In the OSI model, which layer is responsible for establishing, managing, and terminating connections?

(a) Application Layer (b) Transport Layer

(c) Network Layer (d) Session Layer

5. Which network technology is primarily used for short-range wireless communication?

(a) Wi-Fi. (b) Bluetooth

(c) LTE (d) Ethernet

6. Which protocol is used to ensure reliable transmission of data across the network?

(a) TCP (b) UDP

(c) ICMP (d) FTP

7. Which term refers to the ability to detect errors in a transmitted data stream?

(a) Bit Stream (b) Error Detection

(c) Multiplexing (d) Bitwise Encoding

8. What is the primary advantage of using a client-server model in multiplayer games?

(a) Less bandwidth usage

(b) Centralized control

(c) Simplified game logic

(d) Improved graphics rendering

9. Which concept refers to the set of characters or objects in a game that are controlled by the computer and not by a player?

(a) Client Object

(b) Network Context

(c) Non-Player Characters

(d) Authority Objects

10. What does a remote procedure call (RPC) allow in a multiplayer game?

(a) Direct control over network protocols

(b) Communication between players on different machines

(c) Synchronous updates of all game states

(d) Remote access to game assets

Section B

$(5 \times 5 = 25)$

Answer **all** questions, choosing either (a) or (b)

11. (a) Explain the concept of network topology and its significance in a computer network.

Or

(b) Discuss the role of encryption/decryption in ensuring data security in network communications.

12. (a) Describe the different OSI layers and their respective functions in network communication.

Or

(b) Explain the concept of error detection and correction in networks, providing examples of methods used.

13. (a) Discuss the network system concepts involved in multiplayer network games.

Or

(b) Explain the roles of client and remote clients in a network multiplayer game setup.

14. (a) What is the importance of game state management in multiplayer game networks?

Or

(b) Explain the process of matchmaking in multiplayer games and its impact on player experience.

15. (a) Describe the function of host migration in a multiplayer game and how it is managed.

Or

(b) Explain the concept of network manager callbacks and their use in managing network behavior in games.

Section C (5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b)

16. (a) Discuss the different types of network topologies and their advantages and disadvantages in game networking.

Or

(b) Explain how encoding and decoding techniques work in ensuring the reliability of data transmission in a network.

17. (a) Discuss the significance of wireless network security protocols like WEP, WPA, and WPA2 in multiplayer games.

Or

(b) Explain the role of Bluetooth networks in facilitating mobile gaming and their limitations.

18. (a) Describe the process of managing non-player characters/objects and their authority in a multiplayer game.

Or

(b) Explain the concept of commands and remote actions in managing multiplayer game dynamics.

19. (a) Discuss the challenges involved in network behavior management when setting up a multiplayer game environment.

Or

(b) Describe how scene management impacts game flow and player interaction in a networked multiplayer environment.

20. (a) Explain the concept and importance of network communication callbacks and their role in synchronizing multiplayer games.

Or

(b) Discuss the various types of network message and their role in ensuring smooth game operation during multiplayer sessions.

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C–6023

Sub. Code
82644

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Fourth Semester

Game Programming

WEB GAME DEVELOPMENT

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. Which of the following is a new semantic element introduced in HTML5?

   (a)

   (b)

   (c) <article>

   (d) <table>

2. Which attribute is not supported in the <audio> tag?

   (a) controls

   (b) autoplay

   (c) loop

   (d) bgcolor

3. Which method is used to parse a JSON string in JavaScript?

(a) JSON.stringify()

(b) JSON.parse()

(c) JSON.decode()

(d) JSON.convert()

4. In JavaScript, how do you declare a two-dimensional array?

(a) let arr = [1, 2, 3, 4];

(b) let arr = [[1,2],[3, 4]];

(c) let arr = [1, [2, 3], 4];

(d) let arr = {1 : [2, 3], 4 : [5, 6]};

5. Which method is used to draw a rectangle on a canvas in HTML5?

(a) canvas.drawRect()

(b) context.drawRect()

(c) context.fillRect()

(d) canvas.fillRect()

6. What JavaScript method is used to handle keyboard events?

(a) controls (b) autoplay

(c) loop (d) bgcolor

7. What is the primary purpose of collision detection in games?

(a) To update the game score

(b) To detect when game objects intersect

(c) To render graphics

(d) To handle user input

8. Which type of collision detection is used to detect intersections between circular objects?

(a) Axis-Aligned Bounding Box (AABB)

(b) Pixel Collision Detection

(c) Circle Collision Detection

(d) Bounding Box Collision Detection

9. Which JavaScript library is used for 2D physics simulations in web games?

(a) jQuery (b) D3.js

(c) Box2D (d) React.js

10. What is the purpose of the Debug Draw feature in Box2D?

(a) To render game graphics

(b) To visualize physics bodies and collisions

(c) To manage game states

(d) To handle user inputs

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

Answer **all** questions, choosing either (a) or (b).

11. (a) Brief about the key differences between HTML4 and HTML5.

Or

(b) Explain in detail about the purpose and use of semantic tags in HTML5.

12. (a) Discuss in detail about the Document Object Model (DOM) in JavaScript.

Or

(b) Briefly explain about the concept of callback functions in JavaScript.

13. (a) Discuss in detail about the key components and functionality required for a basic image slider.

Or

(b) Briefly explain about the process of parsing JSON data in JavaScript.

14. (a) Explain about the importance of designing a game UI (User Interface).

Or

(b) Explain in detail about the concept of background scrolling in 2D games.

15. (a) Discuss in detail about the basic setup process for integrating Box2D into a web game

Or

(b) Explain in detail about the purpose of collision detection in Box2D.

Part C

(5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) Compare and contrast HTML4 and HTML5 in terms of semantic elements and multimedia capabilities

Or

(b) Discuss in detail about the concept of semantic tags in HTML5 and their impact on web accessibility and SEO

17. (a) Elaborate on the process of form validation in JavaScript, including client-side validation techniques.

Or

(b) Pen down in detail about the use of JavaScript frameworks in modern web development.

18. (a) Explain in detail about the role of event handling in creating interactive web applications.

Or

(b) Infer the broad view about the techniques for implementing image sliders and carousels in web pages Using JavaScript.

19. (a) Explain in detail about the concept of a Heads-Up Display (HUD) in game UI design.

Or

(b) Pen down in detail about the techniques for implementing background scrolling in a 2D game

20. (a) Discuss in detail about the integration of Box2D for physics simulation in web-based games.

Or

(b) Explain in detail about the principles of collision detection in Box2D and its application in game development

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C–6024	Sub. Code 82646

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025.

Fourth Semester

Game Programming

MOBILE GAME DEVELOPMENT

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. What is the default value of a boolean variable in Java?

   (a) true (b) false

   (c) 0 (d) null

2. Which of the following best describes encapsulation in Java?

   (a) The ability to run the same code on multiple platforms

   (b) The concept of wrapping data and methods into a single unit

   (c) The process of hiding the implementation details from the user

   (d) Both (b) and (c)

3. Which of the following allows a class to have multiple methods with the same name but different parameters?

(a) Method Overriding

(b) Method Overloading

(c) Method Hiding

(d) Method Binding

4. Which of the following is a correct statement about abstract classes in Java?

(a) Abstract classes can be instantiated

(b) Abstract classes cannot have abstract methods.

(c) Abstract classes can have both abstract and non-abstract methods.

(d) Abstract classes can have a main method

5. Which of the following is not an element of a mobile OS?

(a) Activity (b) Service

(c) UI (d) Constructor

6. What is the primary role of an IDE in mobile development?

(a) To manage hardware resources

(b) To provide tools for writing and debugging code

(c) To control the device's operating system

(d) To enhance the security of applications

7. Which class in game development is typically used for drawing 2D images?

(a) Spritebatch

(b) Bitmap

(c) Canvas

(d) Framebuffer

8. What is the main purpose of the Camera class in game development?

(a) To capture photos

(b) To manage the player's health

(c) To control the view of the game world

(d) To handle sound effects

9. What is the primary use of a physics engine in game development?

(a) To render graphics

(b) To simulate realistic movements and interactions

(c) To play sound effects

(d) To manage game levels

10. What does parallax scrolling achieve in a game?

(a) Creates a 3D effect by moving background layers at different speeds

(b) Synchronizes sound with game events

(c) Enhances the game's user interface

(d) Manages game state transitions

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Brief about the concept of polymorphism in Java.

Or

(b) Explain in detail about the significance of the this keyword in Java.

12. (a) Discuss in detail about the method overriding in Java.

Or

(b) Briefly explain about the different types of inheritance in Java.

13. (a) Discuss in detail about the key elements of a mobile operating system.

Or

(b) Briefly explain about the steps involved in setting up and running an application using an emulator.

14. (a) Explain about the game development life cycle.

Or

(b) Explain in detail about the role of the Spritebatch and Sprite classes in game development.

15. (a) Discuss in detail about the parallax scrolling.

Or

(b) Explain in detail about the process of integrating a physics engine into a game.

Part C (5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) Explain in detail about the principles of Object-Oriented Programming (OOP) in Java.

Or

(b) Discuss in detail about the various control statements in Java.

17. (a) Elaborate on the concept of inheritance in Java with a detailed example.

Or

(b) Pen down in detail about the importance of method overloading in Java.

18. (a) Explain in detail about the role and benefits of mobile platforms in modern software development.

Or

(b) Infer the broad view about the components and features of an Integrated Development Environment.

19. (a) Explain in detail about the basics of graphics libraries used in game development.

Or

(b) Pen down in detail about the game class and game life cycle in detail.

20. (a) Discuss in detail about the process of implementing screen transitions and handling sensors in a game.

Or

(b) Explain in detail about the steps involved in designing levels and programming gameplay interactions.

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C–6025	Sub. Code 82651

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025.

Fifth Semester

Game Programming

ARTIFICIAL INTELLIGENCE FOR GAMES

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. The level of AI model refers to

   (a) The physical complexity of the model

   (b) The depth of problem-solving abilities

   (c) The algorithm used in problem-solving

   (d) The hardware used for execution

2. What is the primary characteristic of a production system in AI?

   (a) It defines the actions of an intelligent agent

   (b) It specifies the problem's state space

   (c) It provides a framework for pattern recognition

   (d) It limits the choices in decision making

3. Which type of AI is primarily used for chasing and evading in games?

(a) Roaming AI

(b) Patterned Roaming AI

(c) Backtracking AI

(d) Strategic AI

4. Which of the following is NOT a type of AI discussed in the course?

(a) Roaming AI

(b) Patterned Roaming AI

(c) Backtracking AI

(d) Random AI

5. What does "Flocking AI" primarily refer to in game development?

(a) AI that mimics animal group behavior

(b) AI that follows a specific fixed path

(c) AI used for solving puzzles

(d) AI that focuses on learning from the environment

6. In the context of path finding AI, A* algorithm is primarily used for

(a) Chasing and evading

(b) Planning and strategizing

(c) Findings the shortest path

(d) Decision-making in uncertain environments

7. Which of the following is a key feature of finite state machines in game AI?

(a) Real-time adaptation

(b) A set of fixed states and transitions

(c) Random actions generation

(d) Recursive problem-solving

8. Fuzzy Logic is used in AI to

(a) Make decisions under uncertainty

(b) Find the shortest path in a grid

(c) Simulate human emotions

(d) Generate random solutions

9. What AI techniques is based on simulating natural selection and genetic evolution?

(a) Fuzzy logic

(b) Genetic algorithms

(c) Neural networks

(d) Rule-based AI

10. Bayesian Networks are used to

(a) Model uncertain knowledge

(b) Represent deterministic systems

(c) Optimize game strategies

(d) Simulate random processes

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Discuss the key problems associated with defining a problem as a state space search.

Or

(b) Explain the significance of criteria for success in Artificial Intelligence problem-solving.

12. (a) What are the key differences between Game AI and general AI? Discuss the advantages and disadvantages of Game AI.

Or

(b) Describe the concept of "Patterned Roaming" and its application in AI-based games.

13. (a) Explain the concept of deterministic and non-deterministic systems in AI and their relevance to Game AI.

Or

(b) How does pathfinding in Game AI differ from pathfinding in general AI systems?

14. (a) Describe the role of fuzzy reasoning in AI systems.

Or

(b) Discuss the concept of Bayesian Networks and their application in AI.

15. (a) Explain the architecture of expert systems and the role of knowledge acquisition.

Or

(b) How does combining AI techniques produce intelligent agents for game development?

Part C (5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) Discuss the various techniques used in Game AI for strategic decision-making.

Or

(b) Describe behavioural AI and State Change are used to create dynamic and responsive AI characters games.

17. (a) Explain the importance of knowledge representation in AI systems. Discuss the different types of systems used for knowledge representation.

Or

(b) Analyze the various methods used in AI for production-based system representation and their impact on game development.

18. (a) Discuss the role of Genetic Algorithms and Neural Networks in the development of AI for games.

Or

(b) Explain how Rule-based Systems and Finite State Machines contribute to creating intelligent behavior in games.

19. (a) Analyze the significance of AI techniques such as Flocking, Steering AI and Chasing and Evading in the development of complex game environments.

Or

(b) Describe how strategic AI can enhance the player's experience in games through decision-making processes.

20. (a) Explain how Expert Systems are applied in real-world AI solutions and their relevance to the gaming industry.

Or

(b) Discuss the future of AI in games, focusing on the integration of advanced techniques for intelligent game agents

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C–6027	Sub. Code 82652

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Fifth Semester

Game Programming

GAME PROGRAMMING PATTERNS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. What is the primary goal of using design patterns in software development?

   (a) To speed up the development process

   (b) To provide reusable solutions for recurring problems

   (c) To simplify code structure

   (d) To create more complex code

2. Which of the following is a type of creational design pattern?

   (a) Chain of Responsibility

   (b) Command

   (c) Abstract Factory

   (d) Iterator

3. Which design pattern is primarily used for decoupling the interface from the implementation?

(a) Factory Method (b) Adapter

(c) Composite (d) Proxy

4. The Singleton design pattern ensures that a class has only one instance and provides a global point of access to it. What type of design pattern is this?

(a) Creational

(b) Structural

(c) Behavioral

(d) Optimizing

5. Which design pattern is most useful for adding new functionality to an object without altering its structure?

(a) Proxy (b) Observer

(c) Decorator (d) Facade

6. What does the Facade pattern provide in a system?

(a) A simplified interface to a complex subsystem

(b) A mechanism to handle object instantiation

(c) A way to structure a system to handle different game stales

(d) A technique for object pooling

7. In the Chain of Responsibility pattern, what is the main advantage?

(a) Ability to pass the request along a chain of handlers

(b) Multiple object creations

(c) Object pooling

(d) Decoupling of interface from implementation

8. Which pattern is used to allow objects to alter their behavior when their internal state changes?

(a) Strategy (b) State

(c) Memento (d) Command

9. The Composite pattern is useful in which scenario?

(a) When creating user interfaces with hierarchical structures

(b) When dealing with state transitions in a game

(c) When creating singleton objects

(d) When defining complex interactions between game entities

10. What is the primary difference between a Prototype and Factory Method pattern?

(a) Prototype clones objects, while Factory Method creates new ones

(b) Prototype is used for game mechanics, while Factory Method is for UI

(c) Factory Method is used for state management, while Prototype handles collisions

(d) Prototype and Factory Method are identical

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain the difference between Abstract Factory and Factory Method design patterns.

Or

(b) Describe the role of Composite design pattern in game development and provide an example.

12. (a) How does the Strategy pattern help in altering game behaviors dynamically?

Or

(b) Discuss the importance of the Singleton pattern in managing game states.

13. (a) What are the key components of the Observer pattern, and how can it be applied in a game environment?

Or

(b) Discuss the Proxy design pattern and its use in controlling access to game resources.

14. (a) Describe how the Facade pattern simplifies game system interaction.

Or

(b) Explain the Command design pattern and its use in managing game actions.

15. (a) What role does the Memento design pattern play in saving game progress?

Or

(b) Discuss the implementation of the State pattern in managing game character states.

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

Answer **all** questions choosing either (a) or (b).

16. (a) Discuss the application of the Observer and Mediator design patterns in handling game events and user interactions.

Or

(b) Explain how the Strategy and State design patterns can be used to improve game AI.

17. (a) How do sequencing patterns such as the Game Loop and Double Buffer contribute to the performance of a game?

Or

(b) Discuss the use of the Component and "Event Queue" patterns in managing game entities.

18. (a) Explain how the Adapter and Proxy design patterns are used to integrate new features in existing game systems.

Or

(b) Discuss the impact of using the Flyweight pattern in reducing memory usage in large-scale games.

19. (a) Compare and contrast the Factory Method and Abstract Factory patterns, with specific examples from game development.

Or

(b) Discuss the challenges and benefits of implementing the Composite pattern in a complex game UI.

20. (a) Explain how Patterning and Waypoint systems can be integrated into game Al for effective path finding.

Or

(b) Analyze the role of Genetic Algorithms and Artificial Neural Networks in creating adaptive game AI.

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C–6028

Sub. Code
82653A

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Fifth Semester

Game Programming

SOUND DESIGN FOR GAMES

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. What is the primary role of sound in game development?

   (a) To provide background noise

   (b) To enhance player immersion

   (c) To make the game more visually appealing

   (d) To simulate real-world scenarios

2. Which of the following is not considered an element of sound design for games?

   (a) Music

   (b) Environmental effects

   (c) Voiceovers

   (d) Video rendering

3. What is the role of microphones in sound recording?

(a) To produce music

(b) To capture sound

(c) To create noise reduction

(d) To mix sounds

4. In sound editing, what is the primary purpose of noise reduction?

(a) To improve sound clarity

(b) To add new sound effects

(c) To simulate 3D sound

(d) To create dynamic soundscapes

5. Which of the following tools is typically used for sound recording and editing?

(a) Digital Audio Workstations (DAWs)

(b) Game Engines

(c) Audio Middleware

(d) Script Editors

6. What does adaptive soundscape refer to?

(a) Music that remains the same throughout the game

(b) Sound effects that change according to gameplay actions

(c) The creation of background music

(d) Sounds that only play during character interactions

7. What is the purpose of spatial audio in game design?

(a) To simulate visual effects

(b) To create distance and directionality in sound

(c) To generate random sound effects

(d) To increase the file size of audio

8. Which technique is used in 3D sound design to simulate environmental effects?

(a) Sound layering

(b) Binaural audio

(c) Noise reduction

(d) Audio scripting

9. What is the emotional impact of sound in games?

(a) To entertain the player

(b) To distract the player

(c) To create tension, atmosphere, and narrative

(d) To increase game difficulty

10. Which of the following is an example of a dynamic music system?

(a) Background music that remains constant

(b) Pre-recorded voiceovers

(c) Static sound effects

(d) Music that reacts to player actions

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Discuss the importance of sound in game development and how it enhances player immersion.

Or

(b) Explain the different elements of sound design in games and their role in creating an immersive experience.

12. (a) Describe the basic techniques of sound recording and the tools used for editing sound.

Or

(b) How do you clean and edit recorded sounds for a game scene, and why is this important?

13. (a) What is interactive audio in games, and how can it be implemented through scripting?

Or

(b) Explain the concept of adaptive soundscapes and how they are created in games.

14. (a) What is the role of spatial audio in game design, and how can it enhance the player's experience?

Or

(b) Discuss the differences between binaural and 3D positioning in spatial audio.

15. (a) How does sound contribute to emotional storytelling in games?

Or

(b) Provide examples of games where sound has been used effectively to convey narrative and atmosphere.

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

Answer **all** questions, choosing either (a) or (b).

16. (a) Explain the psychological impact of sound design on players in games, providing examples of how sound can affect immersion.

Or

(b) Discuss how the role of sound design has evolved in modern games, and the tools that have contributed to this evolution.

17. (a) Analyze the process of sound recording for games, including the use of microphones and digital audio workstations (DAWs).

Or

(b) Evaluate the challenges and techniques involved in editing and mixing sound for games.

18. (a) Discuss the concept of dynamic music systems in games and how they react to gameplay, providing examples.

Or

(b) Explain the relationship between interactive audio and player actions, and how scripting is used to implement audio events.

19. (a) Describe the techniques used to create spatial audio in games, focusing on the use of binaural audio and 3D positioning.

Or

(b) Evaluate the role of audio middleware in integrating spatial audio into a game environment,

20. (a) Explain the emotional impact of sound in storytelling, particularly in conveying atmosphere, tension, and narrative.

Or

(b) Discuss case studies of games where sound design played a crucial role in storytelling, with examples.

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C–6034	Sub. Code 82654C

B.Sc. DEGREE EXAMINATION, NOVEMBER 2025

Fifth Semester

Game Programming

EMERGING TRENDS IN GAME DEVELOPMENT

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. The primary goal of Virtual Reality (VR) is _____

   (a) To create high-definition video content

   (b) To simulate a computer-based experience for office tasks

   (c) To immerse users in a computer-generated environment that interacts with them

   (d) To replace physical reality completely with computer-generated visuals

2. In a bird's-eye view of VR software, which of the following is NOT typically included _____

   (a) Game engines

   (b) Physics simulators

   (c) Graphics rendering libraries

   (d) Touch screen hardware drivers

3. _____ operation is performed to combine two rotations represented as quaternions.

(a) Multiplication (b) Subtraction

(c) Addition (d) Division

4. The view port transformation responsible for _____

(a) Scaling the 3D model uniformly

(b) Adjusting object size relative to screen resolution

(c) Transforming object coordinates into the canonical view

(d) Converting normalized device coordinates to screen space coordinates

5. _____ causes light to bend when it passes from one medium to another.

(a) Reflection (b) Dispersion

(c) Refraction (d) Diffraction

6. _____ is the following being a common type of lens aberration.

(a) Angular distortion

(b) Chromatic aberration

(c) Intensity degradation

(d) Focal inconsistency

7. _____ is the primary purpose of image acquisition in AR systems.

(a) To generate synthetic 3D models

(b) To capture raw data for further processing like feature extraction and tracking

(c) To store images for archival purposes

(d) To improve the resolution of AR devices

8. A widely used technique for feature extraction in AR systems is _____

(a) Scale-Invariant Feature Transform

(b) Fast Fourier Transform

(c) Histogram Equalization

(d) Genetic Algorithm

9. The primary role of sensing in IoT systems is _____

(a) To process data from cloud services

(b) To transmit data between devices using communication protocols

(c) To collect data from the physical environment for further processing

(d) To store data in distributed databases

10. A key feature of the Smart Grid in IoT is _____

(a) B. Enhanced bandwidth for high-speed internet

(b) Neural interfaces for gaming

(c) Predictive analytics for health monitoring

(d) Automated power distribution and monitoring

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

Answer **all** questions, choosing either (a) or (b).

11. (a) Summarize the components of a bird's-eye view of a VR system.

Or

(b) Discuss the methods and techniques used to create and represent 3D objects in a VR environment.

12. (a) Explain the concept of axis-angle representation for rotations.

Or

(b) What is a viewing transformation, and why is it essential in the 3D graphics pipeline?

13. (a) Outline the phenomenon of refraction.

Or

(b) Describe the working principles of camera-based tracking systems.

14. (a) Discuss the advantages and limitations of AR based tracking methods.

Or

(b) Explain the Speeded-Up Robust Features (SURF) algorithm.

15. (a) Analyze different types of sensors used in IoT applications.

Or

(b) Discuss the working of BCIs and their role in applications like neuro gaming and assistive devices.

Part C

(5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) Explain the primary goals of Virtual Reality (VR) and discuss how VR systems achieve user immersion and interactivity.

Or

(b) Identify and describe various applications of VR in fields such as gaming, industrial training.

17. (a) Explain why quaternion are preferred over Euler angles and matrices in certain applications, providing examples where appropriate.

Or

(b) Summarize the viewport transformation and its role in the graphics pipeline.

18. (a) Discuss different types of aberrations such as chromatic aberration and spherical aberration with examples.

Or

(b) Discuss how depth perception and motion perception are integrated into virtual reality systems.

19. (a) Explain the classification of Augmented Reality (AR) systems based on sensor-based, and vision-based.

Or

(b) Outline the Scale-Invariant Feature Transform (SIFT) algorithm.

20. (a) Explain how actuators work with sensors and provide examples of applications where actuation plays a critical role.

Or

(b) Discuss the challenges and methods of data handling and analytics in IoT systems.

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