| C–3730 | Sub. Code |
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| | 82613 |

**B.Sc. DEGREE EXAMINATION**

**GAME PROGRAMMING**

**APRIL 2021 EXAMINATION**

**&**

**APRIL 2020 ARREAR EXAMINATION**

**First Semester**

**GAMES ANALYSIS AND DESIGN**

**(2019 onwards)**

Duration : 3 Hours Maximum : 75 Marks

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

Answer **all** questions.

1. Brief about evolution of games.

2. Explain the terms: (a) TDD (b) Brainstorming (c) Griefing (d) Gamejam.

3. What is "Tension maps" in game design?

4. Difference between game mechanics and dynamics.

5. Two coins are tossed at the same time, what is the probability that no two heads are obtained?

6. Difference between skill and chance.

7. What is game economics? How to balance it?

8. What is virtual architecture in games?

9. What is mind mapping? Give an example.

10. Write a short note on flow of influences.

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

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

11. (a) What is Iterative design? Explain how iterative design influence your game design.

Or

(b) Quickly develop a casual puzzle game concept for mobile platform. Sketch the paper prototyping of the game world and its various elements.

12. (a) Find the probability of getting a numbered card when a card is drawn from the pack of 52 cards.

Or

(b) What is loop of interaction. Explain in detail.

13. (a) What comprises human interest? Discuss in detail various factors of interest.

Or

(b) What is Aesthetics in Design? Explain the value and power of aesthetics in world designing.

14. (a) What are the various channels of information gameplay?

Or

(b) What is world designing? Design a game world that attracts kids groups.

15. (a) What is uncanny valley? Explain briefly with examples.

Or

(b) Describe the taxonomy of players in detail.

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

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

16. (a) Develop a project document for any existing digital game of your choice.

Or

(b) What are non-digital games? Illustrate its process of designing.

17. (a) What are chances in Games? Why you need to add or remove chances? What are the different ways of implementing chances to your game?

Or

(b) Explain in detail on the basic principles of game making and designing for human mind.

18. (a) What is game character designing? Sketch a game character suitable for a 2D action platformer.

Or

(b) What is level designing in Games? Explain in detail with suitable example.

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| | 82614 |

**B.Sc. DEGREE EXAMINATION**

**GAME PROGRAMMING**

**APRIL 2021 EXAMINATION**

**&**

**APRIL 2020 ARREAR EXAMINATION**

**First Semester**

**PROGRAMMING FOR GAME DEVELOPMENT**

**(2019 onwards)**

Duration : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. What is the use of constants in C++?
2. Define recursive function.
3. What is pointer and write syntax of the pointer?
4. What is data Abstraction?
5. Define function Overloading.
6. What is the use of 'this' pointer?
7. List out the basic operations carried out in a linked list.
8. State the different ways of representing expressions.
9. Define sorting.
10. Explain queue and its types.

## Part B (5 × 5 = 25)

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

11. (a) Discuss about nested if statements in C++.

Or

(b) Write a c+ program to illustrate inline function.

12. (a) Briefly explain about passing pointers to functions. Give example.

Or

(b) Write C++ program sum of 10 given number using one dimensional array.

13. (a) Explain about compile time and run time polymorphism.

Or

(b) Discuss about function overriding with suitable example.

14. (a) Write a C++ program to perform file operations.

Or

(b) Briefly explain enumerations with example.

15. (a) Explain queue and its operations.

Or

(b) Discuss about Iterators.

## Part C (3 × 10 = 30)

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

16. (a) Explain in detail about break and continue statements with an example.

Or

(b) Discuss in detail about defining and using multidimensional arrays with example.

17. (a) What is file? How will you read and writer text files in C++? Explain with example.

Or

(b) What is virtual function and write a program using virtual function.

18. (a) Define templates. Discuss in detail about function and class templates.

Or

(b) Explain in detail about linear search technique with example.

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| | 82623 |

**B.Sc. DEGREE EXAMINATION**

**GAME PROGRAMMING**

**APRIL 2021 EXAMINATION**

**&**

**APRIL 2020 ARREAR EXAMINATION**

**Second Semester**

**ALGORITHMS AND DATA STRUCTURES**

**(2019 onwards)**

Duration : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. What are the three stages of problem solving aspect?

2. What are the features of an efficient algorithm?

3. List the types of sorting methods.

4. Show the merge sort with example.

5. What is meant by depth and height of a tree?

6. Draw the expression tree for $(a+b*c)+((d*e+f)*g)$.

7. Define dynamic programming.

8. List out the algorithm techniques used in dynamic programming.

9. Define backtracking.

10. Define branch and bound in problem solving.

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

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

11. (a) Explain briefly about the notations used in algorithm.

Or

(b) How to visualize the algorithm in problem solving technique?

12. (a) Write short notes on brute force algorithm.

Or

(b) Explain about exhaustive search with example.

13. (a) Construct an expression tree for the expression $A+(B-C)*D+(E*F)$.

Or

(b) Differentiate DFS and BFS with suitable example.

14. (a) Explain briefly about Dynamic programming.

Or

(b) Give an example for optimal binary search trees.

15. (a) Write short note on branch and bound techniques.

Or

(b) Write short note on approximation algorithms.

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

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

16. (a) Explain briefly about big oh notation.

Or

(b) Explain about in order, post order and pre order traversal methods with example.

17. (a) Explain how the knapsack problem is handled by greedy algorithm to arrive at solution.

Or

(b) Explain briefly about Breadth first search with example.

18. (a) Write brief notes on branch and bound techniques.

Or

(b) Write and explain weighted and unweighted shortest path algorithm.

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| | 82624 |

**B.Sc. DEGREE EXAMINATION**

**GAME PROGRAMMING**

**APRIL 2021 EXAMINATION**

**&**

**APRIL 2020 ARREAR EXAMINATION**

**Second Semester**

**GAME MATHS AND PHYSICS**

**(2019 onwards)**

Duration : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Define complex numbers.

2. List the different types of coordinate systems.

3. How to identify whether two lines are parallel or perpendicular?

4. What is Pi (Π) ? List all the angles with respect to Pi.

5. Explain Euler's equation of motion.

6. Define Euclidean space.

7. How can we build an object that behaves like a spring?

8. During deformation, discuss the changes happen to the length and mass of the solid material?

9. What are the different states of an object?

10. What is the name of the process that converts fluids to gaseous state?

**Part B** (5 × 5 = 25)

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

11. (a) Explain Determinants and their applications.

Or

(b) What is coordinate systems Discuss the coordinate system utilized in games.

12. (a) What is vector and discuss their application in games.

Or

(b) Explain the process of converting a vector to a scalar with an example.

13. (a) Write a short on various classifications of Rigid body.

Or

(b) Write a short note on Rigid body transformation.

14. (a) List various examples of deformable bodies and their characteristics.

Or

(b) Explain and discuss about surface deformation with proper example.

15. (a) Discuss Green's theorem and its application.

Or

(b) Discuss the procedure to create a waterfall simulation in games.

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

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

16. (a) Write a detailed note on Cartesian coordinates.

Or

(b) Explain in detail about matrices and their application in transformation.

17. (a) Write a detailed note on interpolation.

Or

(b) Explain quaternion and Euler Angles. Discuss their applications and distinguish them.

18. (a) Write a detailed note on Divergence and Curl.

Or

(b) Write a detailed note on the implementation of 2D fluid mechanism.

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**B.Sc. DEGREE EXAMINATION**

**GAME PROGRAMMING**

**APRIL 2021 EXAMINATION**

**&**

**APRIL 2020 ARREAR EXAMINATION**

**Second Semester**

**2D GRAPHICS PROGRAMMING**

**(2019 onwards)**

Duration : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. What is Graphics programming?

2. What do you mean by shader?

3. Briefly explain the co-ordinate system.

4. What is Vertex buffer?

5. What is a Game Loop? Why do you need it?

6. What is skew?

7. What is a Level editor? Give any two examples.

8. What is Tiling in level design?

9. Discuss about applied science in games.

10. How will you apply force on any game object?

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

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

11. (a) Explain the different states of rendering pipeline in graphics programming.

Or

(b) Discuss the event handling methods in open GL window.

12. (a) How to draw a Quad in 3D space. Explain the different ways to do it.

Or

(b) Discuss the steps to implement FOV in games.

13. (a) What is virtual camera? Explain the various camera operations.

Or

(b) Distinguish world coordinates and screen coordinates. Also discuss how to convert screen to world coordinate.

14. (a) What is sprite animation? How do you use sprite sheet?

Or

(b) What is a level editor? Discuss its basic functionality.

15. (a) What is particle system? Explain how it is dynamically handled in games?

Or

(b) Discuss the steps to implement any one particle effect in your game.

## Part C (3 × 10 = 30)

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

16. (a) What is VBO? Explain with a code on how to create manage and use VBO?

Or

(b) What is graphics library? List various Graphics API and their special characteristics.

17. (a) What are shaders? Explain the different vertex and pixel shaders with example.

Or

(b) Write a detailed no transformation matrices.

18. (a) Write a program to explain event handling with Graphics API.

Or

(b) How to implement basic physics system in game.

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**B.Sc. DEGREE EXAMINATION**

**GAME PROGRAMMING**

**APRIL 2021 EXAMINATION**

**&**

**APRIL 2020 ARREAR EXAMINATION**

**Third Semester**

**3D GRAPHICS PROGRAMMING**

**(2019 onwards)**

Duration : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. What is modern openGL? List the advantages and disadvantages.

2. Describe the 3D co-ordinate system in Game world.

3. What is a callback function? Give an example.

4. What is collision detection? Mention the technique used to find this.

5. Explain the terms (a) Tilt (b) Pan.

6. Write the syntax to enable depth buffer. What is the use of enabling it?

7. What is lighting? List the different types of lighting in OpenGL.

8. Write the syntax to make the mouse invisible on the openGL window.

9. What is GLFW? List the steps to add a GLFW library to your project.

10. What is view space? How do you employ it in openGL?

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

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

11. (a) What is Euler angles? Explain the concept in detail.

Or

(b) Explain the shader types in detail

(i) Tessellation shader

(ii) Geometry shader.

12. (a) Write a basic shader program to render a colored 3D object on the screen.

Or

(b) Explain the GLM functions with syntax and examples.

(i) LookAt (ii) Translate

(iii) Normalize (iv) Perspective.

13. (a) Explain how a real world material gets reflected with lights in a openGL 3D scene.

Or

(b) Illustrate in detail on Phong and Gouraud shading.

14. (a) What is AABB? Write a program to incorporate bounding box for objects.

Or

(b) What is Ray casting? How to implement it in openGL?

15. (a) What are the different filtering options available with textures?

Or

(b) How to apply phong light to a 3D object? Illusrate using a program.

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

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

16. (a) Design a framework structure for openGL that allows you to build a 2D and 3D game on top of it.

Or

(b) What is GLSL? Write a program to read and process a GLSL file.

17. (a) Write a program to illustrate how a light's color changes the object's color.

Or

(b) What is particle system? How to achieve 2D and 3D particle effects using OpenGL.

18. (a) Explain the various buffers used in OpenGL with sample code.

Or

(b) Write a program to incorporate first person camera movement inside a 3D world.

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**B.sc. DEGREE EXAMINATION**

**GAME PROGRAMMING**

**APRIL 2021 EXAMINATION**

**&**

**APRIL 2020 ARREAR EXAMINATION**

**Third Semester**

**GAME NETWORKING TECHNIQUES**

**(2019 onwards)**

Duration : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. What are uses of computer networks?

2. Discuss the issue in transport layer.

3. What are difference between Browsing and Surfing?

4. What is the functionality of Bridge?

5. What is ipconfig command

6. Define local client.

7. Define Network manage

8. What are the relationship between a client, a server, and a host?

9. What is meant by proxy server?

10. What is ClientRpc calls?

**Part B** (5 × 5 = 25)

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

11. (a) Give the main function of Data Link Layer.

Or

(b) Why does DNS use UDP and not TCP?

12. (a) What is WEP? Explain the purpose of WEP.

Or

(b) Explain the difference between Wi-Fi Protected Access and Wired Equivalent Privacy.

13. (a) Explain why do we need default gateway.

Or

(b) Briefly explain of difference between Remote client copy and client export/import.

14. (a) Explain the following

(i) Game State Management

(ii) Spawn management

(iii) Scene Management.

Or

(b) How does RPC call works?

15. (a) Explain the basic process for adding a Network Lobby to a Multiplayer game.

Or

(b) What is client/server network advantages and disadvantages? Explain the basic function of a network client/server.

## Part C (3 × 10 = 30)

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

16. (a) Explain the different layers of TCP/IP model.

Or

(b) Name and explain the various methods used for detection of errors while transmitting the data.

17. (a) Explain the various types of encoding and modulation techniques used in data communication.

Or

(b) Explain how to set non-player object client authority.

18. (a) Discuss how to spawn an object with client Authority with appropriate example.

Or

(b) What is callback states? Briefly discuss about the different callback records.

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**B.Sc. DEGREE EXAMINATION**

**GAME PROGRAMMING**

**APRIL 2021 EXAMINATION**

**&**

**APRIL 2020 ARREAR EXAMINATION**

**Third Semester**

**GAME ENGINE — I**

**(2019 onwards)**

Duration : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Define 2.5d animation?

2. Difference between Normal Map & Bump Map?

3. What is Mesh in 3D Modeling?

4. What is a trigger unity?

5. Why animation is important?

6. What is navigation in unity?

7. What does the lens flare mean?

8. What are the best way to create a cinematic cut scene in unity

9. What is UX in gaming?

10. What does sound source mean?

**Part B** (5 × 5 = 25)

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

11. (a) What is Lighting? Explain the different types of lighting.

Or

(b) What is Rendering pipeline? Briefly explain the difference between Primitive, Framgement and pixel.

12. (a) How does the game collision detection works?

Or

(b) Explain about Alpha and Mesh Edges Rendering

13. (a) How to make an animation controller in unity?

Or

(b) How does navigation mesh path finding work in game?

14. (a) Why memory optimization is important?

Or

(b) What is reflection probe? Explain how to add a reflection prob in unity.

15. (a) Explain how to create a game interface.

Or

(b) Explain how to add audio source in unity.

**Part C** (3 × 10 = 30)

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

16. (a) How a 3D game differ from 2D game? Explain with some example.

Or

(b) What is continuous collision detection (CCD)? Explain the different types of methods used in CCD.

17. (a) What is collider? Explain the different collider in unity.

Or

(b) What is generic function? Explain why generic are used and give an example.

18. (a) How to hide an emissive object but keep its affect on the global illumination?

Or

(b) Briefly explain about

(i) Server (ii) Host

(iii) Spawn (iv) Instantiate.

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| | 82642 |

**B.Sc. DEGREE EXAMINATION**

**GAME PROGRAMMING**

**APRIL 2021 EXAMINATION**

**&**

**APRIL 2020 ARREAR EXAMINATION**

**Fourth Semester**

**WEB GAME PROGRAMMING**

**(2019 onwards)**

Duration : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. What are semantic tags? Explain with example.

2. Differentiate SVG & canvas?

3. Explain one dimensional array with an example.

4. What is the usage of get/post method?

5. What is meant by XML parsing?

6. Write the syntax to draw a stroked rectangle.

7. Explain entities.

8. Explain the usage of event listener.

9. What are predefined functions?

10. Differentiate request vs response.

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

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

11. (a) Explain the hierarchy of Document Object Model (DOM).

Or

(b) Explain audio and video tags with different attributes and with example.

12. (a) Explain abstraction in javascript with an example?

Or

(b) Write an script to validate username and password in submit button using javascript?

13. (a) Write the syntax to draw a filled and stroke triangle and explain the parameters used?

Or

(b) Explain JSON parsing with an example?

14. (a) Explain rectangle collision detection with example.

Or

(b) How to implement timer in games with an example?

15. (a) Explain the script to check the number of sprites was clicked by mouseevent in the canvas with example?

Or

(b) Explain request animation frame and its usage with example.

## Part C (3 × 10 = 30)

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

16. (a) Draw a block diagram of a sample web page which includes header, nav, article, section, aside and footer tags and explain each of them in detail.

Or

(b) Explain background scrolling and implementing player jump with proper example.

17. (a) Explain the usage of set Interval and set Timeout method with proper example.

Or

(b) Explain circle and rectangle collision detection with example?

18. (a) Implement the keyboard event for moving an image to left, right, top and button using WASD keys and should stay inside the canvas with proper example.

Or

(b) Explain sprite animation with proper example demonstrating the sprite moving from left to right and vice versa.

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**B.Sc. DEGREE EXAMINATION**

**(COMMON FOR B.SC. (GD AND D)/B.SC. (GP))**

**APRIL 2021 EXAMINATION**

**&**

**APRIL 2020 ARREAR EXAMINATION**

**Fourth Semester**

**MOBILE GAME DEVELOPMENT**

**(2019 onwards)**

Duration : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Differentiate abstraction vs encapsulation.

2. What is the usage of this keyword?

3. Explain method overloading?

4. Explain array list.

5. What is the Android SDK?

6. What is the usage of final keyword?

7. Differentiate extends vs implements keyword?

8. What is meant by services in android?

9. What is the usage of emulator?

10. Explain the usage of shaperenderer class?

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

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

11. (a) Explain encapsulation with an example.

Or

(b) Explain the usage of static keyword with an example.

12. (a) Differentiate method overloading vs method overriding.

Or

(b) Explain multilevel inheritance with example.

13. (a) Explain in detail the components of Android.

Or

(b) Explain the usage of texture packer with example.

14. (a) Explain the usage of orthographic camera with example.

Or

(b) Explain android lifecycle with diagram.

15. (a) Explain screen transition with example.

Or

(b) Write short note on

(i) Spritebatch

(ii) Texture

(iii) Sprite.

## Part C

($3 \times 10 = 30$)

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

16. (a) Explain sprite animation by making a sprite moving from left to right end with sample code.

Or

(b) Explain the usage of keyboard event to demonstrate a player movement inside the screen using keys WASD?

17. (a) Explain circle collision detection with example.

Or

(b) Demonstrate titling and other interactions based on sensors.

18. (a) Using pixmap class draw a hangman and write the sample code.

Or

(b) What is meant by view? Explain List view, Grid view and text view in detail with example.

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