C–5126	Sub. Code
	82613

B.Sc. DEGREE EXAMINATION, NOVEMBER 2021

First Semester

Game Programming

GAMES ANALYSIS AND DESIGN

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Short answer **all** questions.

1. What is New Media? What are the ethics of New Media?
2. List the different Game Genres.
3. Explain the term Game Aesthetics with suitable example
4. What is Skill in Games? List the types
5. What is Level Designing? Give examples.
6. Describe Interest Curves in Player Experience.
7. What is Game Space? How to organize space in games?
8. List the Player types & interaction in games
9. Discuss shortly about Ethics in Game designing.
10. Brief the term player communities and its purpose?

Part B (5 × 5 = 25)

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

11. (a) Difference between Skill & Chance. How this affects your Games mechanics?

Or

(b) Explain the various idea generation techniques followed in game designing.

12. (a) Discuss briefly the Dramatic Elements of a Game?

Or

(b) Explain MDA approach in detail

13. (a) Discuss briefly on Player Experience. Difference between Immersion and Interaction.

Or

(b) Explain briefly about: (i) Modeling (ii) Focusing (iii) Empathizing (iv) Imagination

14. (a) What is Avatars? Explain in detail the advantage and disadvantage of using Avatars in Games?

Or

(b) Explain how to balance between Art and Technology in the world of designing.

15. (a) Discuss the challenges between Real & Virtual Architecture Designing.

Or

(b) What is Chance in Games? A Dice is thrown 3 times. What is the probability of getting 5?

Part C (3 × 10 = 30)

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

16. (a) Sketch the following based on your own game concept idea:

(i) One Game Character

(ii) Game World

(iii) Three Levels

Or

(b) What are Board games? Illustrate on how to develop content for board games in detail.

17. (a) What is Chance and Skill in games? How do you add and remove mechanics into games in this context.

Or

(b) Explain in detail the principles of mental ability that are associated with gameplay making.

18. (a) What is Transmedia World? Explain the properties and success elements in world designing.

Or

(b) Choose any of your favorite game and develop a Game Design Document that contains all the basic requirements.

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C–5127	Sub. Code
	82614

B.Sc. DEGREE EXAMINATION, NOVEMBER 2021

First Semester

Game Programming

PROGRAMMING FOR GAME DEVELOPMENT

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is the difference between a Local and a Global Variable?

2. Define Recursion?

3. Explain null pointer?

4. What are modifiers? What are the types?

5. Differentiate virtual function and pure virtual function?

6. What is Polymorphism? What are its types?

7. Differentiate seekp ()and seekg ()?

8. What is namespace in C++?

9. Explain iterator in C++?

10. What is meant by Derived Containers?

Part B (5 × 5 = 25)

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

11. (a) Explain goto statement with an example?

Or

(b) Differentiate const vs #define with example?

12. (a) Explain structures with example?

Or

(b) Explain call by reference with an example?

13. (a) With an example, explain encapsulation.

Or

(b) Explain function overloading with an example.

14. (a) How to write a file using c++ with example?

Or

(b) Explain namespaces with an example?

15. (a) Explain container adaptors in STL C++?

Or

(b) Explain shortest path algorithm?

Part C (3 × 10 = 30)

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

16. (a) Explain shallow copy constructor with example?

Or

(b) Explain relational and logical operators with example?

17. (a) Briefly explain the facilities available in fstream class for file operations with example.

Or

(b) What is exception handling? Write a C++ program to demonstrate the "try", "throw", and 'catch" keywords for implementing exception handling?

18. (a) Explain operators with example?

Or

(b) List and explain five member functions from vectors and lists classes in STL.

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C–2147

Sub. Code
82624

B.Sc. DEGREE EXAMINATION, NOVEMBER 2021

Second Semester

Game Programming

GAME MATHS AND PHYSICS

(2019 – onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is the difference between rational and irrational numbers?

2. Write the steps to multiply two matrices.

3. What is Approximations?

4. What is a vector?

5. Define Force.

6. What are the different states of a physics body?

7. Distinguish Mass and weight.

8. List some examples of deformable objects.

9. Explain Viscosity.

10. What are the core properties of a fluid object?

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

Answer **all** questions.

11. (a) Discuss about different types of number systems.

Or

(b) Write a detailed note on Vector Spaces.

12. (a) List and explain various vector theorems.

Or

(b) What is Approximations and discuss the problems it solves.

13. (a) Represent Rotation using Matrices.

Or

(b) State all the Newton's Law of motion.

14. (a) How deformable bodies changes its shape and volume? Explain in detail.

Or

(b) Discuss the impact of elasticity in deformable bodies.

15. (a) Discuss various games that use fluid bodies in it.

Or

(b) Write a short note on conservation laws.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain in detail about various Matrix operations.

Or

(b) Discuss how matrices helps to achieve different transformation events.

17. (a) Explain Quaternion and its application in games.

Or

(b) Explain in detail about Lagrangian Dynamics.

18. (a) Write a detailed note on Elasticity, Stress, Strain and mass.

Or

(b) Discuss the implementation of a 3D model of Fluid Flow in detail.

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C–5128	Sub. Code
	82632

B.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Third Semester

Game Programming

3D GRAPHICS PROGRAMMING

(2019 Onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define 3D model.

2. What is terrain?

3. What is ruder cycle?

4. Define bounding tree.

5. Give the types of cameras.

6. What is virtual trackball?

7. What is the purpose of lighting in graphics?

8. What is cel shading?

9. What is rendering?

10. What is specular mapping?

Part B (5 × 5 = 25)

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

(Brief answers)

11. (a) Explain the loading of 3D graphics.

Or

(b) Explain the various types of maps used in graphic design.

12. (a) Briefly discuss the bounding tree.

Or

(b) Describe the occlusion culling in detail.

13. (a) Discuss the characteristics of mouse picking.

Or

(b) Write note on zoom and rotate operation in flexible camera.

14. (a) Describe the multiple light in detail.

Or

(b) Explain the purpose of blend map in graphic programming.

15. (a) What is anti-alaising filtering? Explain in detail.

Or

(b) Briefly explain the skinned mesh.

Part C (3 × 10 = 30)

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

(Essay types)

16. (a) Write a program for rotating cylinder, with viewer movement.

Or

(b) Discuss in detail the 3D transformations with their matrix representations.

17. (a) Explain the concept of flexible camera of an imaging system.

Or

(b) Describe the specular lighting model Also, indicate advantages and disadvantages

18. (a) Explain the various methods of mapping.

Or

(b) With neat diagram explain the components of 3D graphic system for skeletal animation.

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C–5129	Sub. Code 82633

B.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Third Semester

Game Programming

GAME NETWORKING TECHNIQUES

(2019 Onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What are network bridges?

2. What is hub?

3. What is TCP?

4. What is the purpose of network security?

5. What is remote client?

6. What are player objects?

7. What is multiplayer?

8. What is command?

9. What is client?

10. What are the network messages?

Part B (5 × 5 = 25)

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

(Brief answers)

11. (a) Explain the network topology

Or

(b) Discuss the encryption and decryption.

12. (a) State the advantages of wireless network.

Or

(b) Describe the characteristics of mobile network.

13. (a) Describe the network multiplayer game.

Or

(b) Explain the concepts of network context.

14. (a) Explain the scene management.

Or

(b) Explain the spawning.

15. (a) Discuss the benefits of host migration.

Or

(b) Discuss the network servers in detail.

Part C (3 × 10 = 30)

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

(Essay type)

16. (a) Discuss the various types of networks.

Or

(b) Explain the routing algorithm with suitable diagram.

17. (a) Discuss in detail about network monitoring and statistics collection

Or

(b) Explain the functions of network security and firewall.

18. (a) Discuss in detail the functions of remote procedure call.

Or

(b) Explain in detail the network communication.

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C–5130	Sub. Code
	82634

B.Sc. DEGREE EXAMINATION, NOVEMBER 2021

Third Semester

Game Programming

GAME ENGINE – I

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is 2D?
2. What is 3D animation?
3. What is design map?
4. What is ray casting?
5. Define rendering.
6. What is the path finding?
7. Enlist the types of joints.
8. What is UI?
9. How to optimize the memory?
10. What is host?

Part B (5 × 5 = 25)

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

11. (a) Differentiate the 2D and 3D game concepts.

Or

(b) Elaborate the screen dimensions.

12. (a) Describe the methods of 3D basics.

Or

(b) Explain the event handling.

13. (a) Explain the generic functions.

Or

(b) Discuss the various joints.

14. (a) Discuss the properties of pin camera.

Or

(b) Explain the importance of shading.

15. (a) Explain the basics of UI layout.

Or

(b) Highlight the network platform.

Part C (3 × 10 = 30)

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

16. (a) Explain in detail the components for 3D game development.

Or

(b) Explain in detail the various profiler window.

17. (a) Discuss the behaviour of controlled game in detail.

Or

(b) Explain the importance of various types of joints.

18. (a) Explain the importance of texture and lighting in game.

Or

(b) Explain the designing of user interface for game with a suitable example.

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C–5132	Sub. Code 82651

B.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Fifth Semester

Game Programming

GAME ENGINE-II

(2019 Onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Game engine
2. List the transform tools
3. What are called asmaps?
4. What is terrain?
5. What is matinee soundtrack?
6. What is Post processing
7. What is blue print input key binding?
8. What is HUD WIDGES and list the uses of this
9. Define VFX.
10. What is animation popup?

Part B (5 × 5 = 25)

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

11. (a) Describe the functions of Primitive Geometry.

Or

(b) Explain the significant lighting in game engine.

12. (a) Explain the process of Vertex painting.

Or

(b) Describe uses of Video Texture.

13. (a) How to create AI and Enemy basics? Explain in detail.

Or

(b) Explain the Loading Screens.

14. (a) What is Cascade VEX? Explain in detail.

Or

(b) Write a detail note on Teleporting Players.

15. (a) Write a detail note on Regenerating health systems.

Or

(b) Write detail note on Moving Platform.

Part C (3 × 10 = 30)

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

16. (a) Explain the landscape editing basics with an example.

Or

(b) Write a brief note on Matinee skeletal mesh animation

17. (a) Explain detail Packaging and export setting.

Or

(b) Write the details about Low health vignette effect.

18. (a) Write detailed note on Animated Popup messages.

Or

(b) Write an essay about types of games and event in games.

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C–5133	Sub. Code
	82653

B.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Fifth Semester

Game Programming

ARTIFICIAL INTELLIGENCE

(2019 Onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define AI technique.

2. What is Prolog in AI?

3. What is Patterned Roaming?

4. What is Steering AI

5. Define Genetic Algorithms.

6. What is Game AI?

7. Define Fuzzy State machines.

8. What is Chasing?

9. Define "Rule Based AI"

10. What is Strategical AI?

Part B (5 × 5 = 25)

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

11. (a) Elaborate the AI problems.

Or

(b) Explain detail about the AI techniques.

12. (a) Describe the Patterned Roaming

Or

(b) Explain the Behavioral stages of AI

13. (a) What is Deterministic? Explain in detail.

Or

(b) Write short note on Chasing and Evading.

14. (a) How would you differ between Backward and Forward chaining?

Or

(b) Explain detail about the Bayesian Theory.

15. (a) Write short note on meta Knowledge.

Or

(b) Elaborate about Architecture of expert system.

Part C (3 × 10 = 30)

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

16. (a) Why do we need Artificial Intelligence? Explain in detail

Or

(b) Write detail note about Production system characteristics.

17. (a) Explain in detail about the advantages and disadvantages of AI

Or

(b) Write detail note about the importance of good Game AI

18. (a) Write an essay about " The future for AI in games".

Or

(b) What is a Bayesian network and why is it important in AI? Explain in detail

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C–5134	Sub. Code
	82654

B.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Fifth Semester

Game Programming

GAME PROGRAMMING PATTERN

(2019 Onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is Design Pattern?
2. Define Inheritance.
3. Define Abstract Factory.
4. What is Decorator?
5. Define Mediator
6. What is façade?
7. Define Builder.
8. What is Composite?
9. Define Double buffer.
10. What is Bricks system?

Part B (5 × 5 = 25)

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

11. (a) Elaborate the Design pattern history.

Or

(b) Write short note on usage of design pattern.

12. (a) Explain detail about the structural design pattern

Or

(b) Describe Private class data.

13. (a) Write a short note on Temple method

Or

(b) What is flyweight? Explain in detail.

14. (a) Describe sequencing pattern.

Or

(b) Explain the functions of Game loop.

15. (a) What are strategies of Power up Management?

Or

(b) Describe Collision control.

Part C (3 × 10 = 30)

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

16. (a) Write a brief note on Types of Design pattern.

Or

(b) Write a brief note on Proxy Behavioral design pattern

17. (a) Explain detail about Proxy chain of Responsibility.

Or

(b) Write a brief note on Creational Design pattern.

18. (a) Explain detail about Common factors in breakout and space invaders

Or

(b) Write a brief note on Event Queue.

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C–5135	Sub. Code 82655 (A)

B.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Fifth Semester

Game Programming

SHADER PROGRAMMING

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is a fragment shader?

2. Define Tessellation.

3. What is called Uniform value?

4. What are Homogeneous Coordinates?

5. Define Global Illumination

6. What is Point Light?

7. Explain Pyramid of vision.

8. Define Alpha map.

9. What is edge detection in image processing?

10. What is digital image classification?

Part B (5 × 5 = 25)

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

11. (a) Write a note on Pixel processing.

Or

(b) Write a note on shader languages like OpenGL, HLSL.

12. (a) Explain rotation matrices and cumulating transformations.

Or

(b) Explain perspective projection.

13. (a) How to create a toon shader with lighting models?

Or

(b) Explain diffuse lighting model which follows Lamberts Law.

14. (a) Write a note on texture and depth.

Or

(b) How to do image-based lighting?

15. (a) What is the difference between Gaussian blur and lens blur?

Or

(b) Write about Deblurring Gaussian blur.

Part C (3 × 10 = 30)

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

16. (a) Explain the following with OpenGL
    (i) Vertex Transformation
    (ii) Lighting Model
    (iii) Fragment Shading
    (iv) Phong Lighting model and
    (v) Shadows

Or

(b) Write an essay on Geometry shaders, vertex attributes and how to generate dynamic geometry.

17. (a) What is filtering and mipmapping, and how to use them? Explain Linear, Anisotropic filtering and mipmaps.

Or

(b) Write an essay on physically based rendering.

18. (a) Explain how to create the render target and rendering texture. Focus on the applications include in-game cameras, post-processing, and as many GFX as you can imagine.

Or

(b) What are the differences between displacement, bump and normal maps in 3D models.

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C–5136	Sub. Code 82655 (B)

B.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Fifth Semester

Game Programming

GAME ENGINE ARCHITECTURE

(2019 Onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Game Frame.

2. What is called an integrated development environment?

3. Define ODE.

4. What is meant by math library?

5. What is the use of front end?

6. List any four player I/O component.

7. What is realtime global illumination?

8. Explain an object centric model.

9. What is data-oriented game engine design?

10. Define simple level loading.

Part B (5 × 5 = 25)

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

11. (a) What is the main purpose of platform abstraction?

Or

(b) Write about forward error correction.

12. (a) Write about the resource manager.

Or

(b) Five an introduction to debugging.

13. (a) What are the pros and cons of Brush Geometry?

Or

(b) Describe how to use background game web elements.

14. (a) What is the best and optimized technique for level handling in parking games?

Or

(b) Write about parallel execution in design goals.

15. (a) What are the key components that create gameplay?

Or

(b) Explain game object update order.

Part C (3 × 10 = 30)

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

16. (a) Write an essay on the most common game genres and explore the technology requirements particular to each.

Or

(b) Write an essay on open source game engines.

17. (a) Write about memory management's allocators, overhead, waste and fragmentation.

Or

(b) Write an essay on Game play foundations systems.

18. (a) What are the differences between physics simulation and rigid body simulation.

Or

(b) Describe the game world editor of any first person shooter and real time strategy game you know.

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C–5137	Sub. Code 82655 (C)

B.Sc. DEGREE EXAMINATION, NOVEMBER 2021.

Fifth Semester

Game Programming

EMERGING TRENDS

(2019 Onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What direction is yaw?

2. What is called a vertical vanishing point?

3. What is the role of gyroscopes in smartphones?

4. Define Photogrammetry.

5. Write about canonical views of objects.

6. What is quaternion angle?

7. What is light filtration?

8. How to measure tilt?

9. What is point feature matching?

10. What is the difference between sensing and actuation?

Part B (5 × 5 = 25)

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

11. (a) Write a note on Euclidean space.

Or

(b) How do you explain birds-eye view?

12. (a) What is called extended reality?

Or

(b) Explain window to viewport transformation.

13. (a) Write about quaternions and spatial rotation.

Or

(b) How can one eye alone provide depth perception? Explain binocular disparity.

14. (a) What are the three properties of light?

Or

(b) Explain interest point in image processing.

15. (a) List out the sensors used in Augmented Reality and explain its uses.

Or

(b) How early neurogrames work? Explain NeuroRacer and NeuroMage.

Part C (3 × 10 = 30)

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

16. (a) Explain the geometric approaches to obtain a bird's eye view from an image.

Or

(b) Explain the process of converting the real world to virtually generated world in our brain.

17. (a) Write an essay on Axis-angle representations.

Or

(b) How to correct focus and distortion in Virtual reality? Explain with the nature of human eye motion.

18. (a) Write an essay on Image matching using SIFT, SURF, BRIEF and ORB.

Or

(b) Explain conceptualization of sensor-cloud. Draw the mathematical model and Big-Sensor-Cloud Infrastructure

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