C–2094	Sub. Code
	83743

M.Sc. DEGREE EXAMINATION, APRIL 2024

Fourth Semester

Game Technology

ARTIFICIAL INTELLIGENCE

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define AI model.
2. Enlist the principles for success in AI.
3. Why supervised learning needed?
4. What is parametric model?
5. What is canvas?
6. What is the importance of fuzzy logic?
7. State Bayesian theory.
8. What is K strip?
9. What is meta knowledge?
10. What is expert system?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Describe actions, transition model and goal test.

Or

(b) Describe the features of production system.

12. (a) Briefly describe the communication artificial intelligence.

Or

(b) Write short note on grid-based canvas creation.

13. (a) Describe genetical algorithm for game development.

Or

(b) Describe the fuzzy logic.

14. (a) Write short note on frame-based system.

Or

(b) Compare the rule and principle of AI.

15. (a) Describe the role of expert system.

Or

(b) Write short note on futures of AI in gaming.

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Explain Artificial intelligence model in detail.

Or

(b) Describe the concept of ISA hierarchy with the help of example.

17. (a) Explain multi-layer artificial neural network with an example.

Or

(b) Describe A* algorithm and its derivatives.

18. (a) Describe different approaches to knowledge representation.

Or

(b) Explain the application of AI in game development.

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C–2095

Sub. Code
83744

M.Sc. DEGREE EXAMINATION, APRIL 2024

Fourth Semester

Game Technology

LEVEL DESIGN

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What exactly is game level design?
2. What does level composition serve?
3. What exactly is a normal map?
4. Give the different textures.
5. What exactly is a difficulty curve?
6. Draw a standard difficulty curve.
7. Define your lighting.
8. What exactly is a reflection probe?
9. What is the definition of symmetrical level design?
10. What exactly is an open world game?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain the game's learning curve.

Or

(b) Describe the success game level.

12. (a) Explain how to place trees and grass in texture painting.

Or

(b) What are the various types of texture?

13. (a) In level design, talk about the standard difficulty curve.

Or

(b) How to calculate game and level difficulty?

14. (a) Explain the significance of lighting in a game level.

Or

(b) How do you make a point light?

15. (a) Describe the multiplayer map.

Or

(b) How to Make an Open World Game Map?

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain the game level and their uniqueness.

Or

(b) Make a level mock-up with an example.

17. (a) Discuss in detail the various types of texture painting.

Or

(b) Explain in detail the game and level balancing.

18. (a) Discuss the various lighting technique in detail.

Or

(b) Explain the credentials of level design in detail.

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C–2096	Sub. Code
	83745

M.Sc. DEGREE EXAMINATION, APRIL 2024

Fourth Semester

Game Technology

RESEARCH METHODOLOGY

(2019 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Is basic research being different from applied research? Justify.

2. Write the significance of identifying problem for research.

3. What do you understand by hypothesis?

4. State the various sources of error.

5. What is known as case study?

6. List the problems that occur when doing data processing.

7. What is the meaning of interpretation in research?

8. Mention the various types of reports.

9. State the meaning of scaling.

10. Differentiate: Technical report and Popular report.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Discuss briefly the different steps involved in a research process.

Or

(b) Explain the significance of research.

12. (a) How to develop the conceptual framework.

Or

(b) Compare constant and variable.

13. (a) Pen down the characteristics of hypothesis.

Or

(b) Discuss the types of sample design.

14. (a) How to collect the secondary data?

Or

(b) Explain the elements of analysis.

15. (a) Highlight the interpretation technique.

Or

(b) Describe the computer ethics.

Part C

$(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Enumerate on the criteria of good research and the problems encountered by researchers in India.

Or

(b) Explain the literature review in detail with a suitable case study and typical format of a review paper.

17. (a) Describe the meaning and significance Research design.

Or

(b) Enumerate the different methods of collecting data. Explain its merits and demerits.

18. (a) Explain the significance of a research report and narrate the various steps involved in writing such a report.

Or

(b) Explain in detail the evaluation process with an game example.

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C–2578

Sub. Code
83711

M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Game Technology

ADVANCED GAME DEVELOPMENT

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the questions.

1. Which ethical concern is often associated with the collection and use of personal data by online platforms and social media companies?

   (a) Intellectual property infringement

   (b) Cyber bullying

   (c) Privacy violations

   (d) Digital piracy

2. In the context of design and user experience, which element primarily focuses on the functional aspects and how a product or system operates?

   (a) Mechanics (b) Dynamics

   (c) Aesthetics (d) Ethics

3. What is the term for the high-level plan that outlines the overall goals, rules, and objectives of a game?

(a) Game engine (b) Game structure

(c) Game mechanics (d) Game storyboard

4. What is the primary purpose of "subtracting a mechanic" in game design?

(a) To make the game more complex and challenging

(b) To increase the games visual appeal

(c) To add more characters and storylines

(d) To streamline game play and remove unnecessary elements

5. In game design, what does the term "game space" refer to?

(a) The physical location where the game is played

(b) The menu and user interface of the game

(c) The virtual or fictional environment where game play occurs

(d) The soundtrack and audio effects used in the game

6. Which of the following is a key consideration when designing world aesthetics in a game?

(a) Making the world as chaotic and unpredictable as possible

(b) Prioritizing realism over artistic creativity

(c) Consistency in the visual design and thematic elements

(d) Ignoring the impact of aesthetics on player engagement

7. Which of the following is an example of a common game mechanic used in many video games?

(a) The opening credits sequence

(b) The loading screen

(c) The game's marketing strategy

(d) Collecting power-ups to gain abilities

8. Which of the following factors can dynamic game balancing take into account to adjust game play difficulty?

(a) The players age and gender

(b) The amount of time the player has spent in the game

(c) The colour of the player's character

(d) The player's preferred gaming platform

9. Which of the following demographic factors is often used in marketing to understand consumer behaviour and preferences?

(a) Educational level

(b) Height and weight

(c) Favourite colour

(d) Shoe size

10. Which of the following is a potential benefit of participating in player communities in online games?

(a) Increased isolation and social withdrawal

(b) Improved game plays skills and strategy sharing

(c) Reduced access to in-game resources

(d) Greater difficulty in finding multiplayer matches

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

Answer **all** questions.

11. (a) Discuss about game genres.

Or

(b) What is Orthogonality? Brief out.

12. (a) What is meant by structuring a game? Discuss.

Or

(b) Write a brief note on the channels of information gameplay.

13. (a) Write short note on nature of game characters.

Or

(b) Discuss about the audio of environment.

14. (a) Write about the rules of game mechanics.

Or

(b) What is dynamic game balancing? Brief out.

15. (a) Discuss about player interactions.

Or

(b) Write short note on Ergodisc and code.

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

Answer **all** questions.

16. (a) Write a detailed note on Human computer interaction fundamentals.

Or

(b) What is MDA? Explain.

17. (a) Discuss about the social function of games.

Or

(b) Elaborate on emergence and progression in games.

18. (a) Illustrate the importance of Transmedia world.

Or

(b) Explain about the World Aesthetics.

19. (a) Discuss the attributes and states of game mechanics.

Or

(b) Elaborate on balancing game economics.

20. (a) Explain the dynamics of player taxonomy.

Or

(b) Illustrate the importance of ethics in game design.

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C–2579	Sub. Code
	83712

M.Sc. DEGREE EXAMINATION, APRIL 2024.

First Semester

Game Technology

ADVANCED GAME DESIGN AND ANALYSIS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

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

Answer **all** the questions.

1. What is a "game design atom"?
   (a) A tiny, indivisible particle found in video games
   (b) A fundamental building block or element used in game design
   (c) A unit of energy that powers virtual worlds
   (d) A measure of a players progress in a game

2. In the context of gaming, what is an "avatar'?
   (a) A small, in-game currency used for purchases
   (b) A digital representation of a player within a game world
   (c) A type of puzzle commonly found in adventure games
   (d) The final boss in a video game

3. Which of the following is an example of an element of chance commonly used in card games?
   (a) Players decision-making
   (b) Role-playing
   (c) Shuffling the deck
   (d) Resource management

4. Which of the following is an example of a game that heavily relies on mechanics of skill?
   (a) A first-person shooter game where aiming and reflexes matter
   (b) A choose-your-own-adventure book
   (c) A slot machine game in a casino
   (d) A simple coin toss game

5. Which of the following is a common form of intellectual property protection that grants exclusive rights to the creator of an original work?
   (a) Non-disclosure agreement
   (b) Open-source license
   (c) Public domain
   (d) Trademark

6. What does the term 'story arc" refer to?
   (a) A curved path taken by the protagonist in the story
   (b) A type of weapon used by the main character
   (c) The overall structure and progression of a narrative
   (d) The opening scene of a story

7. How do social networks often integrate with games?
   (a) By providing weather updates within the game
   (b) By allowing players to connect and compete with friends
   (c) By offering in-game currency for posting on social media
   (d) By changing the game's graphics based on social network activity

8. Which emerging technology is likely to have a significant impact on the future of social network games by enhancing immersion and interaction?
   (a) 3D printing
   (b) Virtual reality (VR)
   (c) Quantum computing
   (d) Genetic engineering

9. Which of the following is a famous example of a video game often hailed as a work of art due to its storytelling and aesthetics?

(a) Flappy Bird (b) Pong

(c) Journey (d) Sudoku

10. Which of the following is a common platform for playing casual games?

(a) High-end gaming consoles

(b) Virtual reality headsets

(c) Arcade machines

(d) Mobile devices like smart phones

Part B

$(5 \times 5 = 25)$

Answer **all** questions.

11. (a) Write a brief note on iterative design.

Or

(b) Differentiate between goals and theme.

12. (a) Write short note on frequency of decisions.

Or

(b) What is balancing chance? Brief out.

13. (a) List the types of sequels.

Or

(b) Write about learning unfamiliar genre.

14. (a) Distinguish between adding mechanics and removing mechanics.

Or

(b) What are Leader boards? Discuss.

15. (a) Games as art – Justify.

Or

(b) Write a brief note on casual games.

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

Answer **all** questions.

16. (a) Elaborate the core of game design.

Or

(b) What are Avatars and Game bits? Explain.

17. (a) Write a detailed note on the types of decisions.

Or

(b) Describe the mechanics of skill.

18. (a) Explain about the intellectual property.

Or

(b) Illustrate the importance of working backward.

19. (a) Explain the types of multiplayer games.

Or

(b) Discuss about the future of social networks and games.

20. (a) Explain the goals of the User Interface(UI).

Or

(b) Elaborate the types of serious games.

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C–2580	Sub. Code
	83713

M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Game Technology

GAME CONCEPTUALIZATION

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the questions.

1. Which of the following perspective techniques is often used to depict objects or scenes from a bird's-eye view?
   (a) One-point perspective
   (b) Two-point perspective
   (c) Worm's-eye view
   (d) Isometric perspective

2. How does the placement of the vanishing point in perspective drawing affect the appearance of an object?
   (a) It has no effect on the objects appearance
   (b) It determines the object's colour and texture
   (c) It determines the object's appearance and texture
   (d) It creates the illusion of depth and perspective in the object

3. What does the term, "gesture" refer to?
   (a) The size of the drawing canvas
   (b) The overall mood or emotion conveyed by the artwork
   (c) The rhythmic and expressive quality of the pose or movement of the subject
   (d) The specific colours used in the composition

4. Stick figures are often used as a basic framework for

(a) Sketching quick and simplified representations of human or animal figures

(b) Designing complex landscapes and backgrounds

(c) Creating intricate and detailed portraits

(d) Building complex 3D structures

5. Which Gestalt principle suggests that people tend to perceive objects as a unified whole rather than as a collection of individual parts?

(a) Closure (b) Figure-ground

(c) Continuity (d) Proximity

6. Which colour harmony scheme often creates a sense of calm and tranquility by using colours that are close to each other on the colour wheel?

(a) Complementary harmony

(b) Analogous harmony

(c) Triadic harmony

(d) Monochromatic harmony

7. Which term describes a type of texture that appears rough and uneven, often resembling the surface of a stone or tree bark?

(a) Smooth texture (b) Tactile texture

(c) Visual texture (d) Impasto texture

8. Which of the following best describes the concept of "proportion" in art and design?

(a) The arrangement of elements to create a sense of depth

(b) The way colours interact with each other in a composition

(c) The relationship between the sizes of different pads in a composition

(d) The use of shading and highlights to create a three-dimensional effect

9. What is the primary purpose of creating a character sketch in the pre-writing process of a story?

(a) To help writers understand their characters better and ensure consistency in their portrayal

(b) To serve as the final illustration of the character

(c) To determine the font and layout of the text in a book

(d) To introduce new characters abruptly in the story

10. In scriptwriting, what is the term for the standard format used for describing the visual and audio elements of a screenplay?

(a) Manuscript format

(b) Screen format

(c) Audio format

(d) Text format

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

Answer **all** questions.

11. (a) Differentiate between linear perspective and aerial perspective.

Or

(b) What is picture plane? Brief out.

12. (a) List the essentials of human figure drawing.

Or

(b) Write short note on constructing the front view using basic shapes.

13. (a) Write a brief note on Visual abstraction.

Or

(b) Distinguish between color psychology and typography.

14. (a) Write about creating texture using live reference.

Or

(b) Differentiate between scale and proportion.

15. (a) Distinguish between realism and hybrid.

Or

(b) Write short note on character sketching.

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

Answer **all** questions.

16. (a) What is meant by perspective view? Explain.

Or

(b) Describe the perspective terminology.

17. (a) Write a detailed note on figure drawing basics.

Or

(b) Elaborate on the relative proportion of various body parts.

18. (a) Explain cognitive learning model.

Or

(b) Define graphics. Elaborate on the types of graphics.

19. (a) What is a texture? Explain the types of textures.

Or

(b) Illustrate the importance of different materials and their applications.

20. (a) Elaborate on concept art.

Or

(b) Describe the type of scenes.

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C–2581	Sub. Code
	83714

M.Sc. DEGREE EXAMINATION, APRIL 2024.

First Semester

Game Technology

GAME PROGRAMMING

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

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

Answer **all** the questions.

1. Which component of a computer system is responsible for long-term storage of data and programs?

   (a) RAM (Random Access Memory)

   (b) CPU (Central Processing Unit)

   (c) Hard Disk Drive (HDD)

   (d) Power Supply Unit (PSU)

2. Which of the following is a type of translator program used to convert high-level programming code into machine code?

   (a) Compiler (b) Debugger

   (c) Spreadsheet (d) Web Browser

3. In programming, which of the following is used to execute different code blocks based on a specified condition?

   (a) Loop (b) Conditional statement

   (c) Function (d) Variable

4. What is a key characteristic of a recursive function in programming?
   (a) It can only be called once in a program
   (b) It uses a loop to repeat a specific task
   (c) It is limited to a fixed number of iterations
   (d) It calls itself to solve a smaller instance of the same problem

5. What is the primary advantage of returning a pointer from a function rather than returning a copy of a variable?
   (a) It consumes less memory
   (b) It allows for better code readability
   (c) It prevents data corruption
   (d) It allows modifications to the original data

6. In object-oriented programming, what is a user-defined data type typically called?
   (a) Class (b) Object
   (c) Function (d) Variable

7. In object-oriented programming, what is encapsulation primarily concerned with?
   (a) Inheritance
   (b) Data hiding and protection
   (c) Polymorphism
   (d) Abstraction

8. Which of the following is a key requirement for function overloading to work correctly in most programming languages?
   (a) The functions must have the same number of parameters
   (b) The functions must return the same data type
   (c) The functions must be defined in separate files
   (d) The functions must have different parameter lists

9. Which of the following is an example of a common mutating algorithm used for sorting?

(a) Binary search (b) Merge sort

(c) Quick sort (d) Linear search

10. In a singly linked list, how is the traversal of the list typically performed?

(a) Bidirectionally, from both the head and the tail

(b) Unidirectionally, from the head to the tail

(c) By randomly accessing elements using an index

(d) By starting from the middle and moving outward

Section B

$(5 \times 5 = 25)$

Answer **all** questions.

11. (a) What is memory management? Brief out.

Or

(b) Write short note on types of software.

12. (a) Write a brief note on operators.

Or

(b) Write about pass values to functions.

13. (a) Write short note on function pointers.

Or

(b) What are structures? Brief out.

14. (a) Define polymorphism. Brief out.

Or

(b) Write a brief note on abstraction.

15. (a) Write the importance of container adaptor.

Or

(b) Write short note on linked list.

Section C (5 × 8 = 40)

Answer **all** questions.

16. (a) Write a detailed note on generations of computer.

Or

(b) What is a programming language? Illustrate its importance.

17. (a) Write a detailed note on the programming basics.

Or

(b) What is a function? Explain the types of functions.

18. (a) Describe the process of generating pointer to an array.

Or

(b) Define array pointers. Illustrate its importance.

19. (a) What is encapsulation? Explain.

Or

(b) Describe about function overloading.

20. (a) Illustrate the importance of mutating algorithms.

Or

(b) Explain linear data structure.

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C–2582	Sub. Code
	83716A

M.Sc. DEGREE EXAMINATION, APRIL 2024.

First Semester

Game Technology

HISTORY OF ART IN GAMES

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Section A (10 × 1 = 10)

Answer **all** the questions.

1. What is one of the defining characteristics of the Paleolithic era?

   (a) The invention of writing systems

   (b) The use of advanced metal tools

   (c) The development of agriculture and settled communities

   (d) The use of stone tools and a nomadic lifestyle

2. What is the significant feature of the indus Valley Civilization's cities like Harappa and Mohenjo-Daro that demonstrates their advanced urban planning?

   (a) Extensive pyramid-shaped temples

   (b) Use of stone tools and weapons

   (c) Complex sewage and drainage systems

   (d) Widespread use of chariots for transportation

3. In which historical period did Gothic art primarily flourish?

(a) Medieval (b) Ancient Greece

(c) Renaissance (d) Baroque

4. Which are technique was commonly used in manuscript illumination to create intricate and detailed illustrations?

(a) Sculpture (b) Miniature painting

(c) Mosaic (d) Pottery

5. Which writing tool is traditionally associated with calligraphy?

(a) Pencil (b) Fountain pen

(c) Brush or quill (d) Typewriter

6. Which historical period is closely associated with the Ukiyo-e art movement in Japan?

(a) Edo period (b) Heian period

(c) Meiji period (d) Taisho period

7. During which historical dynasty did Mughal art flourish in India?

(a) Gupta Dynasty (b) Maurya Dynasty

(c) Mughal Dynasty (d) Chola Dynasty

8. Which natural material is commonly used as a canvas in Madhubani painting?

(a) Silk fabric

(b) Terracotta pottery

(c) Cowhide parchment

(d) Banana leaves

9. Who is often regarded as the "Father of Impressionism" and is known for his paintings like "Impression, Sunrise"?

(a) Vincent van Gogh (b) Claude Monet

(c) Pablo Picasso (d) Salvador Dali

10. Who is one of the most famous Pop art artists known for his vibrant and colorful depictions of Campbell's Soup cans and Marilyn Monroe?

(a) Vincent van Gogh (b) Jackson Pollock

(c) Andy Warhol (d) Pablo Picasso

Section B

$(5 \times 5 = 25)$

Answer **all** questions.

11. (a) Write short note on Neolithic age.

Or

(b) Discuss about Mesopotamian civilization.

12. (a) What is Baroque art? Brief out.

Or

(b) Write short notes on Hieratic scale.

13. (a) Write a brief note on Bronze art.

Or

(b) What is Byobu? Brief out.

14. (a) Write a note on Rajasthani miniature art.

Or

(b) Write short notes on Manuscript painting.

15. (a) What is Cubism? Brief out.

Or

(b) Distinguish between Dadaism and Surrealism.

Section C (5 × 8 = 40)

Answer **all** questions.

16. (a) Highlight the significance of Paleolithic age.

Or

(b) Elaborate on Ancient Egypt.

17. (a) Illustrate the importance of Manuscript Illumination.

Or

(b) Write a detailed note on Greek and Roman art.

18. (a) Explain the mental perspective of Medieval art.

Or

(b) Describe the process of Japanese wood block printing.

19. (a) Elaborate on Kangra and Warli painting.

Or

(b) Illustrate the significance of Ajantha and Ellora cave paintings.

20. (a) What is Expressionism? Explain.

Or

(b) Write a detailed note on Contemporary Art and Design.

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C–2583	Sub. Code 83716B

M.Sc. DEGREE EXAMINATION, APRIL 2024.

First Semester

Game Technology

GAME MATH AND PHYSICS

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. What is the base of the hexadecimal number system?

   (a) 2 (b) 8

   (c) 10 (d) 16

2. Which of the following is a fundamental property that defines a vector space?

   (a) It must contain real numbers only

   (b) It must have a unique origin point

   (c) It must satisfy the closure, addition, and scalar multiplication properties

   (d) It must be limited to two or three dimensions

3. What are quaternions primarily used for in mathematics and computer graphics?

   (a) Solving linear equations

   (b) Representing 3D rotations and orientations

   (c) Calculating prime numbers

   (d) Describing complex numbers

4. Which type of quaternion interpolation is commonly used to ensure that interpolated rotations take the shortest path between two orientations?
   (a) Linear interpolation
   (b) Spherical Linear Interpolation
   (c) Cubic interpolation
   (d) Bezier interpolation

5. Which of the following terms refers to the movement of a rigid body around a fixed point or axis?
   (a) Linear motion
   (b) Translational motion
   (c) Angular motion
   (d) Rotational motion

6. What principle forms the basis of Lagrangian dynamics and states that the path taken by a system between two points in configuration space is such that the action integral is minimized?
   (a) Hamilton's principle
   (b) Newton's second law
   (c) Kepler's laws
   (d) Planck's principle

7. In a Mass-Spring system, what happens to the period of oscillation when you increase the mass while keeping the spring constant?
   (a) The period decreases
   (b) The period remains the same
   (c) The period increases
   (d) It depends on the amplitude

8. Which type of 3D modelling technique often involves the use of control points to deform and shape a mesh?
   (a) Raster graphics
   (b) Vector graphics
   (c) Polygonal modelling
   (d) Ray tracing

9. What is the curl of a vector field a measure of in vector calculus?

(a) Divergence (b) Circulation

(c) Convergence (d) Gradient

10. Which of the following is a fundamental principle in physics that states that the total energy within a closed system remains constant over time, assuming no external work is done?

(a) Newton's Second Law

(b) Archimedes' Principle

(c) Boyle's Law

(d) Law of Conservation of Energy

Part B

$(5 \times 5 = 25)$

Answer **all** questions.

11. (a) Write a note on Matrices.

Or

(b) What are subspaces? Brief out.

12. (a) Write a brief note on linear algebraic.

Or

(b) Discuss about interpolation of Quaternions.

13. (a) Write short note on classification of rigid body.

Or

(b) What is Euler's equation of motion? Brief out.

14. (a) Differentiate between control point deformation and free form deformation.

Or

(b) Write a brief note on implicit surface deformation.

15. (a) Distinguish between stress and strain.

Or

(b) Define conservation law. Brief out.

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

Answer **all** questions.

16. (a) Elaborate on the Number systems.

Or

(b) Write a detailed note on Cartesian coordinates.

17. (a) What are the basic operations of vectors? Explain its properties.

Or

(b) Explain the derivatives of time.

18. (a) Discuss about Lagrangian Dynamics.

Or

(b) Postulate Newton's Laws.

19. (a) Elaborate on Elasticity, Stress and Strain.

Or

(b) Explain in detail about control point deformation.

20. (a) Describe Vector calculus.

Or

(b) Illustrate the importance of simplified model 3D model.

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C–2584	Sub. Code
	83716C

M.Sc. DEGREE EXAMINATION, APRIL 2024.

First Semester

Game Technology

ADVANCE ART FOR GAME CHARACTER

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

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

Answer **all** the questions.

1. What is the main characteristic of contour lines?
   (a) They are random and chaotic
   (b) They are typically colored
   (c) They follow the outer edges and outlines of a subject
   (d) They are used to create gradients

2. When practicing observational drawing, what might be a potential challenge of focusing exclusively on a single subject matter?
   (a) Limited creativity and imagination
   (b) Faster improvement in technical skills
   (c) Enhanced ability to work with various materials
   (d) Increased understanding of color theory

3. What technique is often used in perspective drawing to create the illusion of depth by making objects appear smaller as they recede into the distance?
   (a) Blending (b) Hatching
   (c) Stippling (d) Foreshortening

4. In which situation is foreshortening most commonly applied in perspective drawing?
   (a) When drawing objects with symmetrical shapes
   (b) When drawing objects that are perpendicular to the viewer's line of sight
   (c) When drawing objects in the foreground
   (d) When drawing objects at various distances from the viewer

5. What is the term for a simplified, stick-figure-like framework used as a foundation for drawing the human figure's proportions and pose?
   (a) Skeletal structure (b) Under drawing
   (c) Gesture drawing (d) Contour drawing

6. When shading a cylindrical form, where is the highlight typically located?
   (a) On the bottom surface of the cylinder
   (b) On the top surface of the cylinder
   (c) Along the vertical side of the cylinder
   (d) On the left side of the cylinder

7. What is the term for a color harmony that involves using three colors evenly spaced around the color wheel, creating a balanced and vibrant palette?
   (a) Monochromatic harmony
   (b) Complementary harmony
   (c) Triadic harmony
   (d) Warm harmony

8. In the RGB color model used for digital displays, which of the following colors is typically represented by the combination of full red, green, and blue?
   (a) Cyan (b) Yellow
   (c) Magenta (d) White

9. Which famous architectural structure is often cited as an example of the golden ratio being used in its design, particularly in the proportions of its dimensions?
   (a) The Great Wall of China
   (b) The Eiffel Tower
   (c) The Parthenon in Athens
   (d) The Taj Mahal

10. In digital art and design, which tool or technique is commonly used to apply texture to digital illustrations or 3D models?
   (a) The smudge tool
   (b) The brush tool
   (c) The eraser tool
   (d) The color picker tool

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

Answer **all** questions.

11. (a) What is consistency in Observational drawing? Brief Out.

Or

(b) What is subject variety? Discuss.

12. (a) Write short notes on overlapping and placements.

Or

(b) Write a brief note on proportional accuracy.

13. (a) Distinguish between Proportion and Gesture.

Or

(b) What is meant by Foreshortening? Brief out.

14. (a) Discuss about the color properties.

Or

(b) Write short note on color Harmonies.

15. (a) Write a brief note on conceptual depth.

Or

(b) Define Golden ratio. Brief out.

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

Answer **all** questions.

16. (a) Discuss about developing visual perception.

Or

(b) Illustrate the importance of contour drawing.

17. (a) Elaborate on converging lines in perspective drawing.

Or

(b) Explain the process of creating depth in perspective drawing.

18. (a) Write a detailed note on the relative proportion of various parts of the body.

Or

(b) Describe about the study of live figure.

19. (a) What is color mixing? Highlight the importance of color mixing.

Or

(b) Elaborate on digital color theory.

20. (a) Discuss about the study of different environment.

Or

(b) Explain the applications of texture and coloring.

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C–2585	Sub. Code
	83721

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Game Technology

2D ART

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. What are the types of perspective views?
   (a) Linear and aerial
   (b) Side and front
   (c) Top-down and bottom-up
   (d) Close-up and distant

2. Which perspective technique involves parallel lines converging at a single point on the horizon line?
   (a) Linear perspective
   (b) Aerial perspective
   (c) Isometric perspective
   (d) Orthographic projection

3. What is the purpose of using a line of action in figure drawing?
   (a) To indicate the direction of movement
   (b) To measure proportions
   (c) To create texture
   (d) To define the silhouette

4. Which basic shapes are often used to simplify body parts in figure drawing?

   (a) Circles and triangles

   (b) Squares and rectangles

   (c) Ovals and pentagons

   (d) Lines and curves

5. What are the elements of design in visual composition?

   (a) Color, shape, and texture

   (b) Proportion, balance, and harmony

   (c) Line, form, and space

   (d) Unity, variety, and contrast

6. According to Gestalt principles, what does the law of proximity state?

   (a) Elements that are close together are perceived as a group

   (b) Similar elements are perceived as a group

   (c) Elements that form a continuous line are perceived as a group

   (d) Elements that are symmetrical are perceived as a group

7. What is the purpose of understanding scale and proportion in textures?

   (a) To create realistic renderings

   (b) To add complexity to the composition

   (c) To confuse the viewer

   (d) To simplify complex concepts

8. In texture creation, what do foreground, mid-ground, and background colors represent?

   (a) Light, medium, and dark values

   (b) Warm, cool, and neutral colors

   (c) Primary, secondary, and tertiary colors

   (d) Complementary colors

9. What is the primary purpose of concept art?
   (a) To confuse the viewer
   (b) To create realistic renderings
   (c) To provide visual development for ideas
   (d) To limit creativity and originality

10. What are the different styles of concept art?
   (a) Realism and surrealism
   (b) Abstract and impressionism
   (c) Cartoony, realism, and hybrid
   (d) Modern and postmodern

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

Answer **all** questions

11. (a) Describe the difference between linear perspective and aerial perspective in drawing.

Or

(b) Discuss the process of constructing a linear perspective in drawing.

12. (a) Explain the importance of proportion and gesture in figure drawing.

Or

(b) Discuss the concept of relative proportion and its significance in figure drawing.

13. (a) Define the characteristics of a good design and explain their importance.

Or

(b) Explain the principles of design and how they influence the creation of artwork.

14. (a) Define texture and describe the different types of textures commonly used in art.

Or

(b) Discuss some useful tips for creating textures in artwork.

15. (a) Explain the concept of concept art and its role in the creative process.

Or

(b) Discuss the importance of world-building in concept art and its elements.

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

Answer **all** questions

16. (a) Explain the process of constructing a linear perspective drawing, including the key steps involved.

Or

(b) Describe the concept of station point in perspective drawing. Explain how the choice of station point affects the perspective of a scene.

17. (a) Discuss the process of simplifying body parts into 2D shapes in figure drawing.

Or

(b) Explain the concept of contour drawing in figure drawing.

18. (a) Explain the concept of visual composition in design.

Or

(b) Explain how artists reduce realism to create stylized and expressive artworks. Explore different approaches to visual abstraction.

19. (a) Explain the concept of foreground, midground, and background colors in textures.

Or

(b) Describe the process of creating texture using live reference.

20. (a) Explore the different styles of concept art, including cartoony, realism, and hybrid approaches.

Or

(b) Describe the process of environment sketching in concept art.

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C–2590	Sub. Code
	83722

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Game Technology

ADVANCED 3D DESIGN TECHNIQUES

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

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

Answer **all** questions.

1. What are the primary tools used in advanced modeling techniques?

   (a) Painting tools (b) Sculpting tools

   (c) Texturing tools (d) Lighting tools

2. What is the importance of retopology in 3D modeling?

   (a) It adds complexity to the model

   (b) It helps in creating organic forms

   (c) It ensures clean edge flow

   (d) It applies surface details

3. What is the goal of photorealistic rendering?

   (a) To create abstract images

   (b) To achieve realistic-looking results

   (c) To focus on stylized visuals

   (d) To simplify the rendering process

4. Which rendering technique focuses on physically accurate attributes?

   (a) Shadow mapping

   (b) Radiosity

   (c) Layered shaders

   (d) Physically based rendering

5. What are the primary controls used in facial rigging?

(a) Joint placement

(b) Blend shapes and morph targets

(c) Hair and cloth dynamics

(d) Lighting and shading

6. What is the purpose of creating expressive faces in character animation?

(a) To create realistic movements

(b) To convey emotions and personality

(c) To optimize performance

(d) To generate secondary motion

7. What does the Rule of Thirds refer to in advanced visualization and presentation?

(a) A technique for creating interactive environments

(b) A method for framing and composition in photography and design

(c) Guidelines for lighting and shading in real-time rendering

(d) Principles of camera movement in cinematography

8. Which principle involves dividing an image into thirds both horizontally and vertically, resulting in nine equal parts?

(a) Rule of Thirds (b) Golden Ratio

(c) Leading Lines (d) Visual Narrative

9. What is the primary purpose of digital clay techniques in 3D design?

(a) To simulate fluid and smoke effects

(b) To generate procedural textures

(c) To sculpt and manipulate 3D models

(d) To integrate real-world objects into virtual environments

10. Which technique involves using algorithms to create textures automatically based on certain parameters?

(a) High-Resolution Details

(b) Displacement Mapping

(c) Procedural Texture Generation

(d) Particle Systems

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

Answer **all** questions

11. (a) Describe the importance of retopology in advanced modeling techniques.

Or

(b) Explain the concept of a non-destructive workflow in 3D modeling.

12. (a) Explain the concept of photorealistic rendering in 3D graphics.

Or

(b) Differentiate between shadow maps and ray tracing techniques in rendering.

13. (a) Explain the process of joint placement and hierarchies in character design and animation.

Or

(b) Discuss the importance of secondary motion in character animation.

14. (a) Explain the significance of framing and composition in advanced visualization and presentation.

Or

(b) Describe the importance of lighting and shading in real-time rendering.

15. (a) Discuss the process of high-resolution details in 3D design.

Or

(b) Explain the role of particle systems in 3D design.

Part C (5 × 8 = 40)

Answer **all** questions

16. (a) Explain the concept of retopology in 3D modeling.

Or

(b) Explore the importance of clean edge flow in 3D modeling.

17. (a) Explain the concept of physically accurate attributes in material realism.

Or

(b) Discuss the importance of energy conservation in photorealistic rendering.

18. (a) Describe the role of facial rig controls in character animation. Discuss techniques for creating expressive faces using blend shapes and morph targets.

Or

(b) Explore the importance of timing for impact in character animation.

19. (a) Explain the role of lighting and shading in real-time visualization.

Or

(b) Discuss the use of leading lines and depth in visual narratives.

20. (a) Describe digital clay techniques in 3D design.

Or

(b) Explain the concept of displacement mapping in 3D design.

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C–2591	Sub. Code
	83723

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Game Technology

SPECIALIZED GAME ENGINE — I

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. What is the primary difference between 2D and 3D game development?

   (a) Depth perception

   (b) Number of dimensions

   (c) Color usage

   (d) Screen size

2. How do you convert screen positions to world positions in a 3D game?

   (a) Using a raycast

   (b) Directly mapping coordinates

   (c) Utilizing trigonometric functions

   (d) By applying shaders

3. What Unity feature is used for basic 3D scripting?

(a) Coroutines

(b) Ray casting

(c) Event Handling

(d) Mesh rendering

4. How can you detect collisions in Unity?

(a) Using Triggers

(b) Using Mesh Filters

(c) Through Animation

(d) By handling Events

5. Which technique is used for implementing render passes?

(a) Path finding

(b) Particle effects

(c) Occlusion culling

(d) Rendering to texture

6. What does Global Illumination refer to in game development?

(a) Implementing render passes

(b) Lighting and shading

(c) Memory optimization

(d) Networking concepts

7. What is the purpose of designing game UI?

(a) Optimizing event management

(b) Improving particle effects

(c) Enhancing sound and music

(d) Providing information to players

8. Which concept involves the arrangement of elements in a game UI?

(a) Server hosting

(b) Basic UI layout

(c) Networking concepts

(d) Memory optimization

9. What is the purpose of implementing events and actions in game play programming?

(a) Enhancing particle effects

(b) Controlling game mechanics

(c) Optimizing memory usage

(d) Building for different platforms

10. Which aspect of game development involves designing AI behaviors?

(a) Basic UI layout

(b) Path finding

(c) Rendering the sky

(d) Networking concepts

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

Answer **all** questions.

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

Or

(b) Discuss the importance of terrain design in 3D game development.

12. (a) Explain the concept of collision detection in Unity 3D game development.

Or

(b) Describe the concept of ray casting in Unity 3D game development.

13. (a) Discuss the role of the camera in Unity game development.

Or

(b) Describe the process of implementing render passes in Unity game development.

14. (a) Discuss the importance of designing game UI in Unity game development.

Or

(b) Describe the networking concepts used in Unity game development, including server, host, spawn, and instantiate.

15. (a) Discuss the concept of events and actions in Unity game development.

Or

(b) Describe the process of implementing particle effects in Unity game development.

Part C (5 × 8 = 40)

Answer **all** questions.

16. (a) Discuss the process of converting screen position to world positions in a 3D game.

Or

(b) Explain the concept of a camera in Unity game development. Discuss the various camera properties and how they impact game play.

17. (a) Explain the concept of triggers in Unity and how they are used to detect interactions between game objects.

Or

(b) Explain the concept of namespaces and list collections in Unity scripting.

18. (a) Describe the process of implementing render passes in game development.

Or

(b) Explain the role of lighting and shading in creating realistic visuals in games.

19. (a) Describe the process of information sharing to the Heads-Up Display (HUD) in games.

Or

(b) Explain the networking concepts of server, host, spawn, and Instantiate in multiplayer game development.

20. (a) Discuss the basic AI mechanics used in games and their role in enhancing game play dynamics.

Or

(b) Discuss the significance of particle effects in game development.

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C–2592	Sub. Code
	83726A

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Game Technology

GAME ENGINE SPECIALIZATION

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

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

Answer **all** questions.

1. What is a game engine?

   (a) A tool used to design game controllers

   (b) Software that powers the development of video games

   (c) A device used to render graphics in games

   (d) A component responsible for audio processing in games

2. Which of the following is NOT a fundamental aspect of game objects?

   (a) Assets (b) Scenes

   (c) Components (d) Scripts

3. What is the primary purpose of creating terrains and landscapes in 3D world creation?

   (a) Enhancing lighting effects

   (b) Adding visual appeal

   (c) Improving player navigation

   (d) Optimizing asset import

4. What is asset import and optimization in 3D world creation?

   (a) Generating terrain textures

   (b) Importing 3D models and optimizing them for performance

   (c) Designing environmental lighting

   (d) Implementing physics engines

5. What are gameplay mechanics?

   (a) The rules and systems governing gameplay interactions

   (b) The graphical elements of a game

   (c) The coding standards used in game development

   (d) The optimization techniques for game performance

6. Which of the following is an example of a gameplay element?

   (a) Terrain generation

   (b) Asset import

   (c) Player controls

   (d) Lighting optimization

7. What does shader basics refer to in advanced graphics and animation?

   (a) Principles of rigging characters

   (b) Fundamentals of materials and rendering techniques

   (c) Techniques for integrating particle systems

   (d) Methods for optimizing graphics performance

8. What is the purpose of animation systems in graphics and animation?

   (a) Rigging characters for movement

   (b) Creating visual effects using shaders

   (c) Integrating particle systems for dynamic scenes

   (d) Facilitating the creation and control of animations

9. What is the focus of designing and implementing user interfaces (UI) in game development?

   (a) Creating character animations

   (b) Enhancing graphics performance

   (c) Improving gameplay mechanics

   (d) Enhancing player interaction and experience

10. What does HUD stand for in the context of user interfaces?

   (a) Heads-Up Display

   (b) High-Definition User Interface

   (c) Human-User Design

   (d) Hyper-Utility Device

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Describe the history of game engines and their significance in the development of video games.

Or

(b) Define game objects, assets, scenes, and components in the context of game development.

12. (a) Describe the process of creating terrains, landscapes, and environments in a 3D game world.

Or

(b) Discuss the principles of environmental design and level composition in 3D game development.

13. (a) Define game mechanics and explain their importance in shaping player interactions and experiences.

Or

(b) Explain the function of camera systems in video games.

14. (a) Describe shader basics in the context of advanced graphics and animation.

Or

(b) Explain the concept of integrating particle systems into graphics for visual effects.

15. (a) Discuss the process of designing and implementing user interfaces (UI) in game development.

Or

(b) Describe the role of sound in user interface design and game development.

Part C (5 × 8 = 40)

Answer **all** questions.

16. (a) Choose a popular game engine and dissect its interface, highlighting key features and tools commonly used by developers.

Or

(b) Explore the basics of scripting for interactivity in game development. Describe how scripting languages are used to implement gameplay mechanics and enhance player engagement.

17. (a) Explain the process of asset import and optimization in a 3D game environment.

Or

(b) Explain how physics engines are used to simulate realistic interactions between objects in a game world and how collision detection is implemented to handle object interactions.

18. (a) Discuss player controls in game development, focusing on how they are implemented to provide responsive and intuitive interactions.

Or

(b) Discuss camera systems in game development and their role in providing players with optimal views of the game world.

19. (a) Describe animation systems in game development, focusing on rigging and character animation.

Or

(b) Explore the integration of particle systems and visual effects in game development.

20. (a) Explain the concept of heads-up displays (HUD) in user interface design for video games.

Or

(b) Explain spatial audio techniques and their significance in game development.

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C–2593	Sub. Code
	83726B

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Game Technology

GAME LEVEL DESIGNING

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

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

Answer **all** questions.

1. What does player-centric design in game level designing focus on?

   (a) Environmental storytelling

   (b) Spatial design and layout

   (c) Balancing challenges and progression

   (d) Designing levels based on player preferences and behaviors

2. Which aspect of level design involves creating a smooth and engaging player experience throughout the game?

   (a) Navigation and way finding

   (b) Balancing challenges and progression

   (c) Flow and pacing

   (d) Reward structures and motivation

3. Which design concept focuses on creating a sense of harmony and variation within game levels?

(a) Flow (b) Balance

(c) Scale (d) Narrative integration

4. What does the "Three-Act Structure" refer to in level layout and flow?

(a) A narrative structure commonly used in game storytelling

(b) A lighting technique for creating atmosphere in game environments

(c) A method for spatial design and layout

(d) A pacing strategy for controlling the rhythm of game play

5. What does environmental storytelling primarily focus on in game design?

(a) Character development

(b) Narrative elements

(c) Game play mechanics

(d) Visual effects

6. How are props utilized in environmental storytelling?

(a) To create challenges for players

(b) To enhance the atmosphere and mood

(c) To provide feedback and rewards

(d) To optimize game performance

7. What do gameplay mechanics primarily refer to in game design?

(a) Narrative elements

(b) Challenges and rewards

(c) Pacing and interactivity

(d) Rules and systems governing player actions

8. What is pacing concerned with in game play mechanics?

(a) Providing feedback to players

(b) Balancing challenges and rewards

(c) Balancing the speed and rhythm of game play

(d) Designing efficient level prototypes

9. What is rapid prototyping primarily focused on in game development?

(a) Balancing challenges and rewards

(b) Creating efficient level designs

(c) Showcasing portfolio and career

(d) Iterative development and play testing

10. How does play testing contribute to level prototyping?

(a) By creating narrative elements

(b) By optimizing game performance

(c) By providing feedback on game play experiences

(d) By showcasing portfolio and career

Section B (5 × 5 = 25)

Answer **all** questions.

11. (a) Discuss the importance of game levels in video game design.

Or

(b) Describe the role of environmental storytelling in game level designing.

12. (a) Explain the significance of balance, contrast, scale, and rhythm in level layout and flow.

Or

(b) Discuss the role of lighting and color schemes in level layout and flow.

13. (a) Discuss the role of storytelling in environmental storytelling and engagement.

Or

(b) Describe the importance of atmosphere in environmental storytelling.

14. (a) Explain the concept of mechanics in game play mechanics and interactivity.

Or

(b) Describe the importance of balancing and pacing in game play mechanics.

15. (a) Explain the concept of rapid prototyping in level prototyping, optimization, and portfolio development.

Or

(b) Discuss the process of performance optimization in level prototyping.

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

Answer **all** questions.

16. (a) Explain the concept of player-centric design in game level designing.

Or

(b) Explain the concept of flow and pacing in game level design.

17. (a) Describe the process of integrating real-world design concepts into game level layout and flow.

Or

(b) Explain the importance of lighting and color schemes in level layout and flow.

18. (a) Describe the narrative elements commonly found in environmental storytelling.

Or

(b) Explain the concept of atmosphere in environmental storytelling.

19. (a) Discuss the role of challenges in game design. Explain how challenges provide opportunities for players to engage and progress within a game?

Or

(b) Describe the concept of pacing in game design.

20. (a) Explain the significance of play testing and iteration in level design.

Or

(b) Explain the concept of efficiency in level design.

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C–2594	Sub. Code 83726C

M.Sc. DEGREE EXAMINATION, APRIL 2024.

Second Semester

Game Technology

SHADER PROGRAMMING

(2023 onwards)

Duration : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions.

1. What is the purpose of shaders in computer graphics?

   (a) To create 3D models

   (b) To render textures

   (c) To perform complex computations for visual effects

   (d) To generate lighting effects

2. Which shading language is commonly used in OpenGL for writing shaders?

   (a) C++ (b) Python

   (c) GLSL (d) Java

3. What are uniforms in the context of shaders?

(a) Variables that hold constant values throughout shader execution

(b) Functions used to manipulate vertex data

(c) Built-in variables provided by the OpenGL library

(d) Shading languages used in OpenGL

4. What is the purpose of the depth buffer in shader programming?

(a) To store color information for each pixel

(b) To control the depth of objects in the scene

(c) To perform matrix transformations

(d) To apply texture mapping

5. Which of the following is NOT a lighting principle in computer graphics?

(a) Surface Normal (b) Light Material

(c) Light Normal (d) Texture Mapping

6. What is the purpose of a directional light in computer graphics?

(a) To illuminate a specific area from multiple positions

(b) To create a spotlight effect

(c) To simulate sunlight coming from a specific direction

(d) To apply cartoon shading effects

7. What is the primary purpose of texture mapping in computer graphics?

(a) To apply colors to surfaces

(b) To simulate lighting effects

(c) To add detail and realism to objects

(d) To create directional lights

8. What is the function of alpha maps in texture rendering?

(a) To control transparency of textures

(b) To adjust lighting direction

(c) To apply bump maps

(d) To simulate fog effects

9. Which of the following is NOT an image operation commonly used in computer graphics?

(a) Filters (b) Edge Detection Filter

(c) Reflection Map (d) Gaussian Blur Effect

10. What effect does the Gaussian Blur Effect procedure on images?

(a) Sharpening of edges

(b) Adding noise to images

(c) Blurring and smoothing of details

(d) Enhancing contrast

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Describe the concept of shaders in computer graphics.

Or

(b) Describe the process of running shaders in a graphics application.

12. (a) Discuss the concept of uniforms in shader programming.

Or

(b) Describe the process of creating a shader program in a graphics application.

13. (a) Explain the principles of lighting in computer graphics.

Or

(b) Describe the concept of light material in computer graphics.

14. (a) Describe texture mapping in computer graphics.

Or

(b) Explain the concept of image-based lighting in computer graphics.

15. (a) Explain the purpose of image operations in computer graphics.

Or

(b) Discuss the Gaussian blur effect in image processing.

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

Answer **all** questions.

16. (a) Explain the importance of shading languages in shader programming. Discuss the characteristics and features of GLSL (OpenGL Shading Language).

Or

(b) Explain the concept of vertex data and vertex attributes in shader programming.

17. (a) Discuss the significance of built-in variables and functions in shader programming.

Or

(b) Explain the concept of algorithmic drawing in shader programming.

18. (a) define surface normal and light normal in the context of lighting in computer graphics. Discuss their significance in determining how light interacts with surfaces in a 3D environment.

Or

(b) Discuss the use of multiple positional lights in lighting simulations.

19. (a) Explain the concept of texture objects in computer graphics.

Or

(b) Discuss the implementation of advanced texture techniques such as mipmapping and projected textures in computer graphics.

20. (a) Describe the edge detection filter in image processing. Explain how edge detection algorithms identify and highlight the edges of objects in digital images.

Or

(b) Explain the concept of the bloom effect in computer graphics. Discuss how the bloom effect enhances the appearance of bright objects and light sources in a scene.

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