National University of Computer and Emerging Sciences

Lahore Campus

Game Design & Development (CS4046)

Date: Feb 25 2025

Course Instructor(s)

Ms. Saba Ghani

Sessional-I Exam

Total Time (Hrs): 1

Total Marks: 50

Total Questions: 6

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Roll No Section Student Signature

	CLO: 2	CLO: 1
Total Marks:	**25**	**25**
Obt. Marks:		

Cutting and overwriting is not allowed. Marks shall be reduced otherwise.
Write your answers in the provided space only.
Fill out the table provided for MCQs. No MCQ will be evaluated otherwise.

CLO # 2: Understand fundamental principles of game design, including gameplay mechanics, player motivation, player narrative and storytelling, pacing, and balance.

Q1: Select the best possible option from MCQs and write option name in this table [15]

1. A	**2. B**	**3. C**	**4. A**	**5. D**	**6. C**	**7. B**	**8. C**
9. C	**10. B**	**11. B**	**12. B**	**13. B**	**14. A**	**15. B**	

1. In **Data-Driven Game Design**, which of the following is used to track player behavior?

a) A/B Testing
b) Player interviews
c) Storyboarding
d) Player reviews

2. Which **camera projection type** in Unity maintains a **consistent scale** regardless of distance?
a) Perspective
b) Orthographic
c) Freeform
d) Camera Projection

3. In a **Data-Driven Game Design** approach, if 60% of players quit after Level 3, what should a designer do first?

a) Add more rewards to Level 3.
b) Increase Level 3 difficulty.
c) Analyze heatmaps and player behavior to find pain points.
d) Remove Level 3 entirely

4. In a **core gameplay loop**, what happens if the **reward system is too strong**?
a) Players may lose interest as the game becomes too easy.
b) Players will always want to replay the game.M,L0O

c) The game world will feel more immersive.
d) The game's story will automatically become more engaging.

5. **Which game world component** is directly affected by **the passage of in-game time**?

a) Space
b) Boundaries
c) Fictional Setting
d) Day/Night Cycle

6. **What makes a hyper-casual game successful in terms of user acquisition?**
a) Deep narrative and high-budget production.
b) A complex progression system with RPG mechanics.
c) Simple, addictive mechanics that are easy to learn but hard to master.
d) Exclusive gameplay mechanics that require premium purchases.

7. You are designing a **3D game** in Unity. Which projection type should you use for **realistic depth perception**?

a) Orthographic
b) Perspective
c) Isometric
d) Flat Rendering

8. **Which monetization strategy works best for mobile hyper-casual games?**

a) Premium one-time purchase.
b) In-game currency with paid boosters.
c) Rewarded video ads and interstitial ads.
d) Subscription-based live content model.

9. A **game design document (GDD)** should NOT include:

a) Core gameplay mechanics.
b) Level design and progression.
c) The final marketing strategy and app store optimization.
d) Technical requirements for development.

10. **Which of the following best describes a "Magic Circle" in game design?**

a) A circle in fantasy games that grants power.
b) A player's mental immersion into the game world.
c) A type of combat system in RPGs.
d) A graphical rendering technique in Unity.

11. In Unity, which component is **responsible for rendering 3D objects** in the game world?
a) Rigidbody
b) Mesh Renderer
c) NavMesh Agent
d) Mesh Filter

12. Which of these is NOT affected by position?
a) Point lights
b) Directional lights
c) Spotlights
d) Area lights

13. Which factor is **most important for player retention** in a Free-to-Play (F2P) game?

a) High difficulty that prevents quick progress.
b) A fair balance between challenge and reward.
c) Long and unskippable tutorial sequences.
d) Repetitive mechanics with no variation.

14. You are developing a **competitive multiplayer shooter**, and players complain about **matchmaking issues** where beginners face highly skilled opponents. What would be the **best long-term solution**?

a) Implement a skill-based ranking system that matches players of similar ability.
b) Reduce the power of skilled players' weapons to balance gameplay.
c) Increase rewards for new players to make them feel competitive.
d) Randomly match players to encourage variety in gameplay.

15. A **mobile Free-to-Play (F2P) game** has a high **download rate** but a very low **Day 7 retention rate** (players don't return after a week). What could be the **most effective** way to improve retention?

a) Increase the frequency of in-game advertisements to maximize revenue.
b) Add daily login rewards, push notifications, and limited-time events.
c) Make the game harder so that players feel more challenged.
d) Remove in-app purchases to make the game feel more rewarding.

Q2. Differentiate between point light and spotlight using the table provided. [06]

	Point Light	**Spotlight**
Definition (02)	A light source that emits light in all directions from a single point, similar to a light bulb or a candle.	A directional light that emits a focused cone of light, like a flashlight or stage spotlight.
Light Distribution (01)	**Omnidirectional** – Spreads evenly in **all directions** (360°).	**Directional & Focused** – Spreads in a **conical shape** with a defined **spot angle**.
Use Case (01)	Used for ambient lighting, fire, or glowing objects that illuminate their surroundings evenly.	Used for flashlights, headlights, spotlights, stage lighting, or focused light effects.
Law (02)	Inverse Square Law – Light intensity decreases proportionally to the square of the distance	Inverse Square Law + Penumbra Law – Light intensity decreases with distance, and penumbra (soft edge) controls the falloff of the light cone.

Q3: Player Experience & Game Setting: [04]
"As a general rule, the more a player understands a game's core mechanics, the less the game world matters." Do you agree or disagree? Explain with an example.

Both: Agree and disagree
It Depends on the Game Type
◈ **In story-driven, open-world, and immersive games** (e.g., *Elden Ring, The Witcher 3*), the world remains **important** even after players master the mechanics.
◈ **In fast-paced, arcade, or competitive games** (e.g., *Tetris, Counter-Strike*), mechanics take **priority**, and the game world becomes secondary.

CLO # 1: Understand gaming industry and product lifecycle of different types of games

Q4: Write down 5 characteristics of Casual games. [05]

Casual games are designed for broad audiences with simple mechanics and engaging gameplay. They are characterized by:

1. **Mass-market appeal**: Accessible to players of all skill levels.
2. **Simpler game mechanics**: Easy to learn, hard to master.
3. **Short sessions**: Players can play in short bursts.
4. **Addictive core mechanic**: Encourages repeated playthroughs.
5. **Freemium model**: Often free-to-play with optional in-app purchases.

Examples: Candy Crush Saga, Angry Birds, Subway Surfers

Q5: Define a transform component of a gameObject in 3D space. [04]

Transform is used to define a model's position, rotation, and scale in 3D space using following multiple vectors (03):

1. Position = vector3(x, y, z)
   a. Displacement from origin of world coordinate system
2. Rotation = vector3(x, y, z)
   a. Degree rotation around each axis
3. Scale = vector3(x, y, z)
   a. Scalefactor on each axis, where 1 = 100%

Transform (01)
Packages position, rotation and scale together

Q6.1: What strategies can be used to make monetization feel rewarding rather than intrusive? Explain any two of them. [02]

1. Rewarded Ads
Players **voluntarily** watch an ad to earn an **in-game benefit** (e.g., extra lives, in-game currency, boosts).
Ads do not **interrupt gameplay** but instead act as **a reward system**.

2. Subscription Models (Sustainable Monetization)
Players subscribe to **monthly premium services** for exclusive perks (e.g., extra XP, free in-game currency, ad-free experience).
Often includes **a mix of rewards** to keep engagement high.

Q6.2: Differentiate three game Ad types [06]
Rubric: 01 (ad type name + description), 01 (pro + con)

	1. Banner Ads	**2. Interstitial Ads**	**3. Rewarded Ads**
Description	Small, static or animated ads placed at the **top or bottom** of the screen during gameplay.	**Full-screen ads** that appear at **natural game breaks** (e.g., between levels or after losing a round).	Players **choose** to watch an ad in exchange for **in-game rewards** (extra lives, currency, boosts).
Pro	Non-intrusive, always visible. Generates passive revenue.	High revenue per impression. Ensures player attention.	Encourages voluntary engagement. Increases retention without forcing spending.
Con	Low engagement and click-through rate. Can clutter the UI.	Can feel intrusive if shown too frequently. May cause players to leave the game.	Players may exploit the system for rewards. Needs balance to avoid overuse.

Q6.3: Briefly explain the following terms:
LTV, Conversion rate, churn rate, baked light [08]

1. LTV (Lifetime Value)
- Definition: The total revenue a player generates throughout their time playing the game.
- Why It Matters: A higher LTV means players are engaged longer and spending more, making the game more profitable.

2. **Conversion Rate**
- **Definition:** The percentage of players who **take a desired action**, such as making a purchase, signing up, or clicking an ad.
- *Example:* If **1000 players** see an offer and **50 players buy it**, the **conversion rate is 5%**.

3. **Churn Rate**
- **Definition:** The percentage of players who **stop playing the game over a period of time**.
- *Example:* If a game had **5000 active players** and **1000 players quit**, the **churn rate = 20%**.

4. **Baked Light**
- Definition: A precomputed (static) lighting system in game engines where light effects are calculated and stored in textures.
- Why It Matters: Improves performance because the game does not need to dynamically calculate lighting in real-time.