



**Number of Pages (3 Pages), Number of questions (5 questions)**

**Answer All the Following Questions**

**Question 1: (15 Marks)**

**Select the best choice for each of the following phrases:**

*(Note: in your answer you can just write the letter of your answer with each phrase number)*

- 1- In Unity3D scripting, which of the following **events** is called automatically at **every frame**?  
a- Start()                      b-Update()                      c-Awake()
- 2- In Unity3D GameObject, which **component** contains the following attributes: **Position, Rotation, and Scale**?  
a-Transform                      b-MeshRenderer                      c-Collider
- 3- In game development teams, which **role** is responsible for **writing and implementing the codes** of the game?  
a- Producer                      b-Sound Designer                      c-Developer
- 4- Which of the following **game testing types** is about testing the **Quality of sound effects**?  
a- AI testing                      b-Game level testing                      c- Audio Testing
- 5- \_\_\_\_\_ Games are games that have **no drawn character to represent the main player**, but the **game camera acts as an eye** for the player during his/her movement?  
a-First Person Shooter                      b- Second Person Shooter                      c-Third Person Shooter
- 6- Which game genre tries to give **near realistic representation** of a **known world activities** to **train** players?  
a- Action Games                      b-Board Games                      c- Simulation Games
- 7- The \_\_\_\_\_ Steering behavior aims to act like **group of nature creatures** (horses, birds, fishes ...etc) in their **continuous movement**?  
a- Hiding                      b- Flocking                      c-Alignment
- 8- Which **map division schema** is built by dividing game world into **regular equal sized shapes** (squares, hexagons, triangles ...etc)?  
a-Tile Grid                      b-Waypoints                      c-Navigation Mesh
- 9- In Unity3D, which **component** is responsible for **visible drawing 3D game objects** on screen?  
a-MeshFilter                      b-Navigation Mesh                      c-Mesh Renderer
- 10- Which **animation principle** is about **defining the main key frames** of the animation **first**, and then **filling the in-between frames** later?  
a-Flocking                      b- Pose-to-Pose                      c-Hiding

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**Question 2- (15 Marks)**

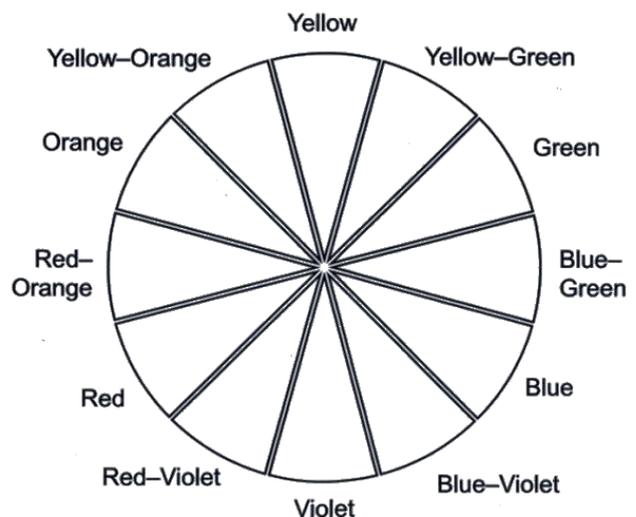
**Rewrite each of the following phrases after correcting its underline part:**

- 1- In 3D world positions, each position is represented in the X and Y directions.
- 2- In Fourth Person Games, the player can controls a drawn character in world as if the player stands behind that character.

- 3- **Fun Testing** for games is about testing how much it's similar to reality in movement, sound effects and visual appearance.
- 4- **Squash and stretch** animation principle is about having viewers' attention/focus to a particular part of the scene by using camera angles, layout, lighting ...etc.
- 5- The **Game Tester** Role is about studying market needs and advertising about the game among customers.
- 6- In the Hero's stages, the **Ordinal World** Stage happens when the hero wins the main prize of the game after facing many challenges in his/her way.
- 7- **AI Testing** is about testing the games working on networks and checking connection failures or latency.
- 8- **Physics Testing** aims to check if user can create his own worlds/ levels in the game or not.
- 9- **Educational games** genre is about avoiding danger characters in the game and reaching target areas without being noticed.
- 10- Localization property in games means to **convert from world point to a graph point**.

### Question 3- (12 Marks)

- A) (4 Marks) Briefly explain each of the following **Animation Principles** (write 1-3 lines for each principle)
1. Anticipation
  2. Follow-through and overlapping action
  3. Slow-in and slow-out
  4. Arcs
- B) (8 Marks) Based on the following colors wheel:
1. **Briefly explain each** of the following colors schemas (using your **words** and **visual drawing** on the wheel).
  2. **Give 2 examples for each schema (by using names for colors).**
    - 1- **Complementary Color** Schema.
    - 2- **Analogous Color** Schema.
    - 3- **Split-complementary Color** Schema.
    - 4- **Triad Color** Schema.



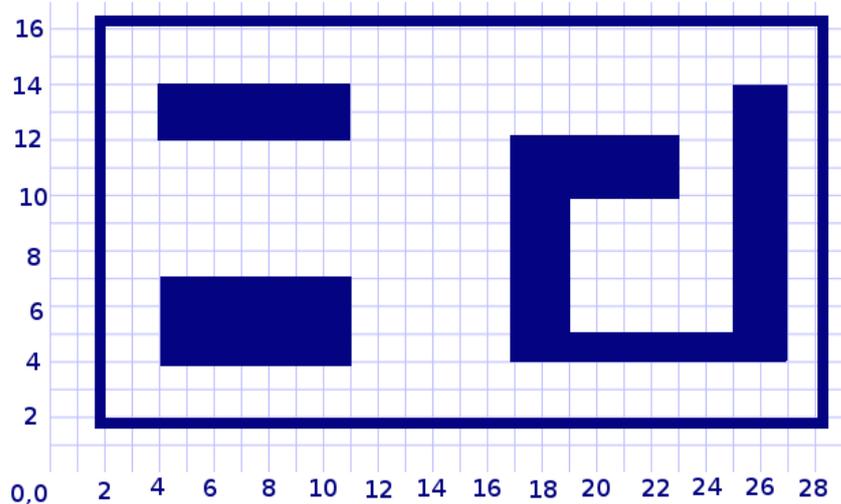
### Question 4 (12 Marks)

- A) (1 Marks) Briefly explain the **usage** of the **Open** and **Closed** lists in Graph search algorithms.
- B) (2 Marks) Write the **Common Main Steps** for **Complete Search Algorithms** using the Open and Closed Lists

- C) (9 Marks) For each of the following **Steering Behaviors Algorithms**, Briefly explain the **Idea** of each Behavior (using your words), and **Write the Main Movement Algorithm** for each of them (You can assume any symbols you need and write its meanings):
1. **Seek()** [Idea + Algorithm]
  2. **Arrival()** [Idea + Algorithm]
  3. **Pursue()** [Idea + Algorithm]

**Question 5: (11 Marks)**

- A) (1 Mark) List **two usages** for **Face Normals** in 3D Modeling. (Note: within 3 lines at most in your answer)
- B) (1 Mark) Briefly explain how "**Gouraud Shading**" works (with **drawings examples**).
- C) (1 Mark) Briefly explain what is **Transparency Map**? (Note: within 2 lines at most in your answer)
- D) (8 Marks) The following image is a **top view Tile Grid map** for an imaginary game level; it is about a **rectangular room** that starts from **point (2, 2) to point (28, 16)**. All the game movements will be inside this room. The **Dark colored areas** in the map are **obstacles** that **no game character can walk in or jump over**. The following map has guideline grid lines at each 1 distance unit.



Suppose that there are two solid **AI Characters: (Cat and Mouse)**, both of them are made as **cubes**. **Cat character dimensions** are **(3.5 x 3.5x 3.5) units**, and **Mouse character dimensions** are **(0.9x 0.9 x 0.9) units**. Based on that information, answer the following:

1. Draw a **Complete valid waypoint map** that suits **Cat Character** using 5 waypoints at most. **[2 Marks]**
2. Draw a **Complete valid waypoint map** that suits **Mouse Character** using 15 waypoints at most. **[3 Marks]**
3. Draw a **valid navigation mesh map** that suits **both Cat and Mouse Characters**. Use **polygons with 4 corners at most**. (Note: highlight your polygons with simple pattern like ). **[3 Marks]**

**End of Exam, Best Wishes to You All,**