



**Benha University**  
**2<sup>nd</sup> Term (March 2025) Midterm Exam**  
**Class: 3<sup>rd</sup> Year Students (CS)**  
**Subject: Virtual/Augmented Reality**



**Faculty of Computers & Informatics**  
**Date: 27/3/2025**  
**Time: 45 Minutes**  
**Examiner(s): Dr. Fatma ElSayed**

**Answer the following questions [ 2 questions]: [15 Marks]**

**Question No. 1**

**[5 Marks]**

**Choose the correct answer: (Put your answer in the following table)**

1	2	3	4	5
C	A	A	C	B

- What is the primary difference between strong AR and weak AR?
  - (A) Strong AR has imprecise tracking
  - (B) Weak AR seamlessly integrates into the real world
  - (C) Strong AR provides natural interaction and accurate tracking
  - (D) Weak AR includes high-quality immersive experiences
- Which of the following is NOT one of the "Four Illusions of Presence"?
  - (A) Sensory Illusion
  - (B) Place Illusion
  - (C) Body Ownership
  - (D) Plausibility Illusion
- What is the key difference between optical see-through and video see-through HMDs?
  - (A) Optical see-through allow users to see the real world directly through transparent lenses
  - (B) Optical see-through capture the real world with cameras
  - (C) Video see-through are ideal for outdoor use
  - (D) Video see-through have lower latency
- Which tracking type uses artificial markers such as QR codes?
  - (A) Markerless Tracking
  - (B) Interest Point Tracking
  - (C) Marker-Based Tracking
  - (D) Edge-Based Tracking
- Which transformation is responsible for converting world coordinates into camera (eye) coordinates?
  - (A) Model Transformation
  - (B) View Transformation
  - (C) Perspective Transformation
  - (D) Local Transformation

**Question No. 2**

**[10 Marks]**

**A. Define virtual reality and list its three main display types?**

**[3 Marks]**

Technology that creates immersive and interactive three-dimensional computer-generated environments, which can be navigated, manipulated, and interacted with by a user.

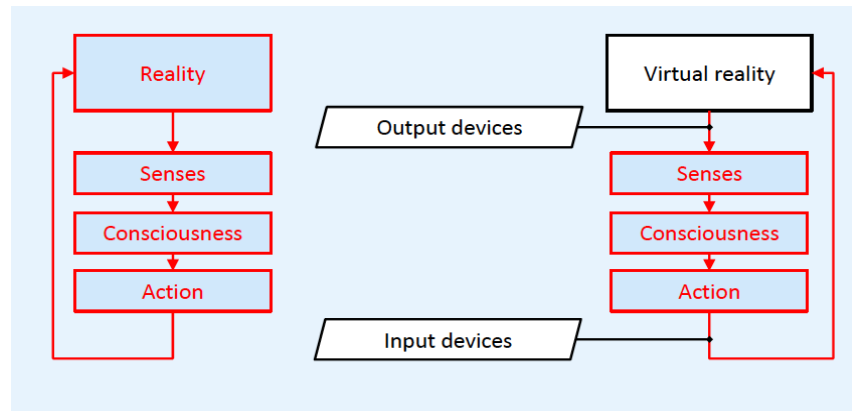
**Display types**

Non-immersive: Users engage with virtual content displayed on a screen.

Semi-immersive: Users engage with virtual content through large projection screens.

Fully-immersive: Users engage with virtual content through VR head-mounted displays (HMD).

**B. Draw a comparative diagram that shows the perception process in reality versus virtual reality? [4 Marks]**



**C. In AR, tracking requirements differ based on the level of stabilization. List and describe briefly the levels of AR tracking stabilization? [3 Marks]**

**Head-stabilized**

- The virtual content is attached to your head
- The information is always in front of the eyes (information always visible)
- Requires minimal tracking (just tracks head movements).

**Body-stabilized**

- The virtual content moves with your body.
- Is always available but not always visible, meaning it can appear when needed.
- The system must track both head and body positions.

**World-stabilized**

- Virtual objects stay fixed relative to the real world, even when you move your head or body.
- The system must track the environment and update the object's position correctly.

*With my best wishes .. Dr. Fatma ElSayed*