UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2022/2023

COURSE NAME	:	VIRTUAL REALITY
COURSE CODE	:	BIM 30803
PROGRAMME CODE	:	BIM
EXAMINATION DATE	:	JULY / AUGUST 2023
DURATION	:	3 HOURS
INSTRUCTION	:	1. ANSWER **ALL** QUESTIONS.
		2. THIS FINAL EXAMINATION IS CONDUCTED VIA **CLOSED BOOK**.
		3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK.

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

Q1 Questions **Q1(a) – Q1(c)** are based on the following statement.

Visual displays are a crucial component of virtual reality (VR) technology as they allow users to visually explore and interact with the virtual world. Creating an immersive experience in VR requires advanced display technologies that can effectively simulate the visual and auditory sensations of being in a different environment.

(a) What are the **TWO (2)** main categories of VR displays and how do they differ in terms of providing an immersive experience? Provide examples of each category and describe their potential use cases.

(10 marks)

(b) Identify **THREE (3)** commonly used technologies for creating immersive experiences in VR.

(6 marks)

(c) By providing an example, explain **ONE (1)** of the technologies identified in **Q1(b)**.

(4 marks)

Q2 (a) Sound localization is the ability of humans to determine the location of sound sources in space. To localize sound, the brain uses information from three coordinates: azimuth, elevation, and distance. The accuracy of sound localization varies depending on the location of the sound source in relation to the listener.

(i) By using an appropriate figure, illustrate these three coordinates.

(3 marks)

(ii) Based on the figure illustrated in **Q2(a)(i)**, explain the accuracy of sound localization.

(9 marks)

(b) You are tasked with developing a virtual reality (VR) driving simulation game that accurately replicates the feel of driving a car, including the sensation of accelerating, braking, and turning.

(i) Suggest which mechanical stimuli suit your project to be integrated into a VR simulation with appropriate justification.

(2 marks)

(ii) Based on your answer in **Q2b(i)**, suggest a suitable method to generate forces in response to user interactions with virtual objects in the driving simulation game. Justify your answer.

(6 marks)

Q3 The sense of taste is the result of a complex interaction between multiple sensory mechanisms. The taste sensation is produced when a substance in the mouth reacts chemically with taste receptor cells. Taste interfaces are still relatively unexplored areas compared to other sensory interfaces like sight or sound.

(a) Explain the concept of taste interfaces and provide examples of **TWO (2)** different taste interfaces.

(10 marks)

(b) Discuss the potential of taste interfaces in creating a more immersive virtual experience.

(10 marks)

Q4 (a) Explain the concept of Mixed Reality. Provide examples of **TWO (2)** different types of Mixed Reality and discuss their potential applications.

(12 marks)

(b) Why is markerless tracking not as widely used as edge-based and marker-based tracking?

(8 marks)

-END OF QUESTIONS-

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