



UTHM

Universiti Tun Hussein Onn Malaysia

**UNIVERSITI TUN HUSSEIN ONN
MALAYSIA**

**FINAL EXAMINATION
ONLINE
SEMESTER II
SESSION 2019/2020**

COURSE NAME : VIRTUAL REALITY
COURSE CODE : BIM 30803
PROGRAMME CODE : 3 BIM
EXAMINATION DATE : JULY 2020
DURATION : 2 HOURS 30 MINUTES
INSTRUCTION : 1. ANSWER **ALL** QUESTIONS
OPEN BOOK EXAMINATION
2. PLEASE MAKE SURE TO CLICK
"SAVE ANSWER" BUTTON FOR
SUBJECTIVE QUESTIONS.
OBJECTIVE QUESTIONS ARE
SAVED AUTOMATICALLY.

TERBUKA

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

CONFIDENTIAL

Q1 Analyze the following scenario:

If a Virtual Observer (VO) is oriented in a Virtual Environment (VE) using XYZ Fixed Angles in the sequence roll, pitch, yaw and translate with the following values:

$$\text{roll} = 180^\circ, \text{pitch} = -90^\circ \text{ and yaw} = -270^\circ;$$

$$(t_x, t_y, t_z) = (5, 2, 1).$$

(a) Sketch the new orientation of VO (12 marks)

(b) Prove that the coordinate of P' is similar with $P (1, 0, 2)$ Show your calculation. (12 marks)

Q2 Based on **Figure Q2**, answer the following questions using XYZ Euler Angles.

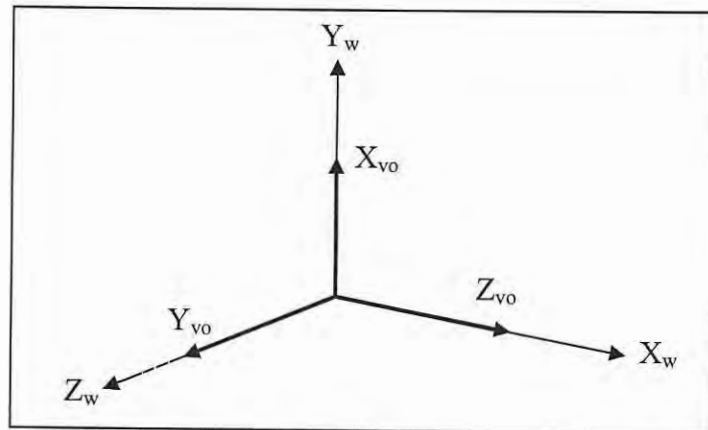


Figure Q2

(a) Sketch the new orientation of Virtual Observer (VO) if the following conditions are given.

$$\text{roll} = 90^\circ, \text{pitch} = 270^\circ, \text{yaw} = -180^\circ$$

$$(t_x, t_y, t_z) = (1, 2, 4)$$

(12 marks)

(b) Calculate the coordinate P' , if $P (1, 2, 2)$ is given.

(10 marks)

Q3 The goal of Virtual Reality is to make it feel like you're actually in a place that you are not. It is a technology that can be used in training professional athletes. Their simulations allowed athletes to train in a virtual field using accurate simulations of a real match.

TERBUKA

CONFIDENTIAL

CONFIDENTIAL

- (a) Suggest **ONE (1)** VR application that can be developed to train any athletes/sports of your choice.
(2 marks)
- (b) Discuss **TWO (2)** important principles in 3D modelling that will be applied in modelling the content for the VR application suggested in **Q3 (a)**.
(6 marks)
- (c) Discuss how the interactions performed in the VR application suggested in **Q3 (a)** could help the athletes to improve their skills/performance.
(4 marks)

- Q4** According to Moore's Law, there is a correlation between technological advancement and social and ethical impacts. One area that introduces a new dimension of ethical concerns is virtual reality (VR). VR continues to develop novel applications beyond simple entertainment, due to the increasing availability of VR technologies and the intense immersive experience. While the potential advantages of virtual reality are limitless, there has been much debate about the complexities that this new technology presents. Suggest **FIVE (5)** detailed general guidelines for healthy users who are attempting to experience VR for the first time.
(15 marks)

- END OF QUESTIONS -

TERBUKA