

CONFIDENTIAL



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2019/2020**

COURSE NAME : VIRTUAL REALITY
COURSE CODE : BIM 30803
PROGRAMME CODE : BIM
EXAMINATION DATE : DECEMBER 2019 / JANUARY 2020
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

TERBUKA

THIS ANSWER SCHEMA CONSISTS OF **THREE (3)** PAGES

CONFIDENTIAL

CONFIDENTIAL

Q1 Based on **Figure Q1**, answer the following questions using XYZ fixed angles.

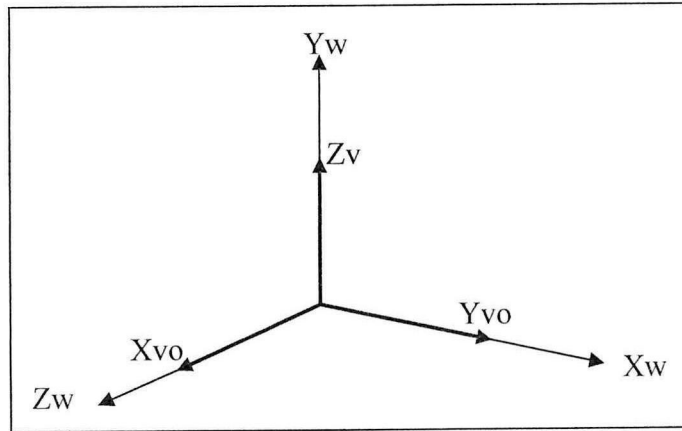


Figure Q1

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

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

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

(12 marks)

- (b) Calculate P' , if the coordinate of P $(1, 1, 0)$ is given .

(10 marks)

Q2 Analyze the following scenario:

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

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

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

- (a) Sketch a new orientation of VO.

(12 marks)

- (b) Prove that the coordinate of P' is similar with P if the coordinate P $(1, 0, 1)$ is given. Show your calculation.

(12 marks)

Q3 Degrees of Freedom (DoF) is often associated with tracking and moving in a virtual environment. Discuss the term based on its type and differences in requirements/usage.

(9 marks)

TERBUKA

CONFIDENTIAL

Q4 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 is suitable to help bed-ridden patients or elderly people with limited movement capacity to experience life as a normal healthy person.

- (a) Suggest **ONE (1)** VR application that can be developed for either one of the user groups mentioned above and justify your reason. (3 marks)
- (b) Select any **THREE (3)** senses and elaborate how the senses can be stimulated in the VR environment. (6 marks)
- (c) Discuss **THREE (3)** principles in 3D modelling that will be applied to the object/character created for the application. (9 marks)
- (d) Discuss any **ONE (1)** type of 3D interaction task that the user will be able to perform. (7 marks)

- END OF QUESTIONS -

TERBUKA