



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2016/2017**

COURSE NAME : VIRTUAL REALITY
COURSE CODE : BIM 30803
PROGRAMME CODE : BIM
EXAMINATION DATE : JUNE 2017
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

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THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

- Q1 (a)** Based on **Figure Q1**, calculate the new orientation of VO using the XYZ Fixed angles method if the following conditions are given. Show your working step by step.

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

$$P(1,1,1), (t_x, t_y, t_z) = (1,3,1)$$

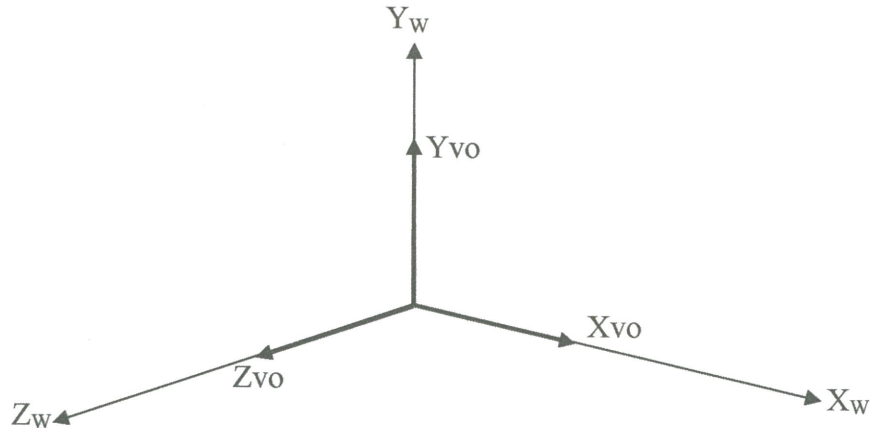


Figure Q1

(7 marks)

- (b)** Analyze the following scenario:

If a VO is oriented in a VE using XYZ Euler angles in the sequence roll, pitch, yaw and translate with the following values roll = 270° , pitch = 90° and yaw = -180° ; $(t_x, t_y, t_z) = (1,2,2)$.

Calculate the coordinate for (x', y', z') if the coordinate $(0,1,1)$ for (x, y, z) is given. Show your working

(5 marks)



- Q2 (a)** List **TWO (2)** transformation styles in modeling transformation.

(2 marks)

- (b)** A unit cube is offset along the x-axis by 1 unit and then scaled by a factor of 3. Calculate the P' of the scaled cube if $P(1,0,0)$ of unit cube is given.

(5 marks)

- (c)** Based on **Figure Q2**, the pyramid is rolled about the z-axis, after performing the 90° pitch rotation. Sketch the new orientation of the pyramid after accomplishing the rotation using direct cosine.

(7 marks)

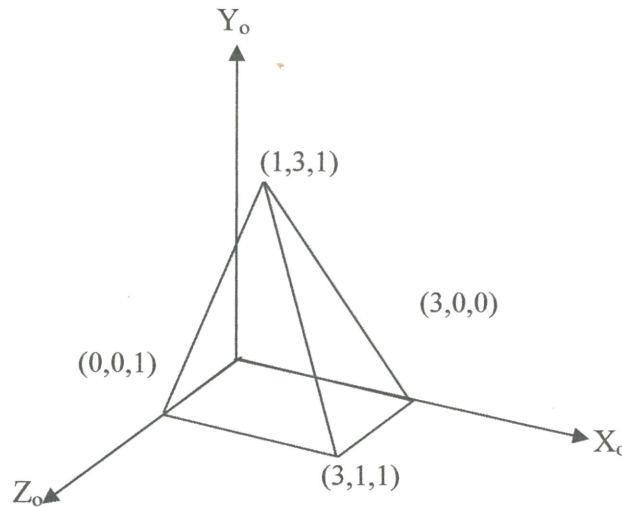


Figure Q2

Q3 You have been appointed as a junior animator in AnimeMe Sdn. Bhd. Your task is to create animation for 50 scenes of a cartoon series within 20 days. Nevertheless, you are lack of experience in using animation software, but excellent in drawing. You are asked to choose **ONE (1)** animation method in order to accomplish your work. Justify your answer by considering two conditions that are production technique, and final output. (12 marks)

Q4 (a) Define manipulation in the context of VR.

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(b) Apply any **TWO (2)** manipulation methods which can be performed within a VR experience. (4 marks)

(c) Describe about Pointer-directed Selection which can be used for item selection or as a directional indicator for travel control. (6 marks)

- Q5** (a) Describe **THREE (3)** different roles of sound in VR system with **ONE (1)** appropriate example for each. (10 marks)
- (b) Explain **TWO (2)** types of haptic rendering. (6 marks)
- Q6** (a) What is mixed realities? (2 marks)
- (b) State **THREE (3)** objectives of applying tracking mechanism in mixed realities. (6 marks)
- (c) Give **TWO (2)** points that differentiate marker-based tracking and markerless tracking. (6 marks)

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- END OF QUESTION -