UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2021/2022

COURSE NAME	:	MULTIMEDIA SYSTEM AND APPLICATION
COURSE CODE	:	BIM 20404
PROGRAMME CODE	:	BIM
EXAMINATION DATE	:	JULY 2022
DURATION	:	3 HOURS
INSTRUCTION	:	1. ANSWER **ALL** QUESTIONS.
		2. THIS FINAL EXAMINATION IS AN **ONLINE** ASSESSMENT AND CONDUCTED VIA **OPEN BOOK.**

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

Q1 Given the following scenario:

ARoMA FG was appointed by UTHM to develop a prototype of an interactive virtual reality system of Catering Laboratory to enhance technical and vocational education and training (TVET) learning experience. The application should be able to shows all equipment and utensils in full immersive environment. Students should be able to interact with objects in the virtual laboratory and prepare foods and beverages in virtual environment. This application also should be able to support practical sessions for catering related courses in UTHM. Due to its urgency, the virtual reality system should be completed within 3 months.

(a) Suggest the most suitable development platform for this project with appropriate justifications.

(6 marks)

(b) Suggest the most suitable peripheral devices for this project with appropriate justifications.

(6 marks)

(c) Discuss multimedia learning metaphors and its related learning theory that can be used to design the virtual reality laboratory.

(12 marks)

(d) Draw **THREE (3)** main interface designs based on the stated requirements.

(12 marks)

Q2 Given the following scenario:

UTHM is currently in the process of digitalizing its campuses especially on teaching and learning activities. One of its initiatives is to provide online learning content using massive open online (MOOC) learning model. Therefore, courses can be taken by a very large number of people around the world. To best manage the learning contents, the system must comply to the Shareable Content Object Reference Model (SCORM) standard. Though all media elements are used in the learning contents, majority of it are video element. Therefore, the video content must be captured and stored on HTTP servers and delivered using HTTP. Video is streamed over the Internet using HTML5 so that the client devices does not have to download the entire video file before playing it. The streaming system should employ HTTP adaptive bitrate streaming to handle multiple speed of connectivity and should be able to handle heterogeneous environments. Though the main idea of the system is to provide learning content for free, UTHM may generate income by providing extra options to the subscribers such as providing professional or verified certificates with some fees.

(a) Suggest the most suitable platform and programming/scripting language for this project with appropriate justifications.

(6 marks)

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(b)   Discuss how MHEG Standard can be implemented in the project.

(6 marks)

(c)   Recommend the most suitable data structure and MMDBMS design approach with appropriate justifications.

(10 marks)

(d)   Discuss the best approach to ensure secure delivery thus preventing copying, forgery and unauthorized distribution of the learning content over the Internet.

(10 marks)

(e)   Suggest the best multimedia streaming technique for the scenario with appropriate and complete figure of its high-level architecture.

(12 marks)

-END OF QUESTIONS –

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