[CRT01]

UNIVERSITY OF BOLTON

SCHOOL OF CREATIVE TECHNOLOGIES
GAMES PROGRAMMING

SEMESTER ONE EXAMINATIONS 2018/2019

GAMES HARDWARE ARCHITECTURE AND PERIPHERALS

MODULE NO: GAP5001

Date: Monday 14th January 2019 **Time: 14:00 – 16:00**

INSTRUCTIONS TO CANDIDATES:

Section A: You MUST ANSWER ALL THREE questions.
These are worth 20 marks each and are technically-based questions.

Section B: COMPULSORY question.
This is worth 40 marks and is an essay style question.

Creative Technologies
Games Programming
Semester One Examination 2018/2019
Games Hardware Architecture and Peripherals
Module No. GAP5001

SECTION A: You <u>MUST ANSWER</u> <u>ALL THREE</u> questions from this section

<u>Question 1:</u>
Cross Platform Development

There are numerous considerations and constraints for developers when they are working on games that are to be played on multiple platforms.

A. Explain the issues facing games developers when they are attempting to develop a game to run across **both** Desktop (Windows, MacOS and Linux) and Mobile (Android and iOS) platforms.

   Your answer should cover **technical and design** considerations for the developers.

   [12 marks]

B. When developing for consoles (Xbox One, PlayStation 4, Switch), a developer has to adhere to the platform holder rules for how games can interact with the console system. List and explain the sort of rules a developer might have to consider (in general terms - you ***don't*** need to quote ***specific*** rules), and how this can be problematic when working on a cross-platform title.

   [8 marks]

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Creative Technologies
Games Programming
Semester One Examination 2018/2019
Games Hardware Architecture and Peripherals
Module No. GAP5001

Question 2
Computer Hardware Architecture

The Von Neumann architecture forms the foundational structure of how most computers handle and process data.

A. Explain what the Von Neumann architecture is by way of a diagram with labelling notation. You should include the fundamental parts of the system and how they "connect" to one another.

[10 marks]

B. The Von Neumann Architecture suffers from what is known as the "The Von Neumann Bottleneck". Explain what this is and why it is problematic for games, and detail what steps can be taken to alleviate it.

[10 marks]

Question 3
Engines

The Unity and Unreal Engine 4 game engines are widely used by developers, from individual "bedroom coders", to large companies such as Blizzard, for many different types of projects.

A. What are the pros and cons of using these engines for small teams involved in the development of games for mobile devices (for both Android and iOS) platforms?

[10 marks]

B. Some developers create their own engines rather than using engines such as Unity or Unreal Engine 4. What are the pros and cons of developing your own in-house engine?

Your answer should focus on the technical and pragmatic reasons for developers to create their own engines. A specific intended platform does not need to be considered in your answer, but platforms can be mentioned if useful to explain a pro/con.

[10 marks]

END OF SECTION A

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Creative Technologies
Games Programming
Semester One Examination 2018/2019
Games Hardware Architecture and Peripherals
Module No. GAP5001

SECTION B: <u>COMPULSORY</u> question

The question below is worth 40 marks and a long-form response is expected. Your answer should contain diagrams to explain concepts where necessary.

<u>Question 4</u>
Virtual Reality and Augmented Reality Technology

Discuss the different categories of Virtual Reality and Augmented Reality headsets on the market today, giving examples of their intended uses, functionality and pros/cons.

Your answer should give examples, including diagrams, about which type of tracking technique the headsets use, and how the tracking techniques work.

Notes:

i. A category of a headset is assumed to be defined by its **intended user base** and **range of functionality**.
ii. A tracking technique is the method by which a headset determines its location and orientation in space and is often a combination of several technologies working together.

[40 marks]

END OF QUESTIONS