CARDIFF UNIVERSITY
EXAMINATION PAPER

Academic Year:	2005-2006
Examination Period:	Spring 2006
Examination Paper Number:	CM0340
Examination Paper Title:	Multimedia
Duration:	2 hours

Do not turn this page over until instructed to do so by the Senior Invigilator.

Structure of Examination Paper:

There are **THREE** pages.
There are **FOUR** questions in total.

There are no appendices.

The maximum mark for the examination paper is 81 marks, and the mark obtainable for each part of a question is shown in brackets alongside the question. Full marks can be obtained by correctly answering 3 questions.

Students to be provided with:

The following items of stationery are to be provided:
One answer book.

Instructions to Students:

Answer **THREE** questions.

The use of translation dictionaries between English or Welsh and a foreign language bearing an appropriate departmental stamp is permitted in this examination.

1. (a) Give a definition of a *Multimedia Authoring System*. [2]

(b) Briefly describe *five* multimedia Authoring Paradigms [5]

(c) Briefly describe *five* ways in which *content* can be *formatted* and *delivered* in a *Multimedia Authoring System*.

[10]

(d) What extra information is multimedia good at conveying with respect to conventional media? Specifically:

(i) What can spoken text convey that written text cannot?
(ii) When might written text be better than spoken text?

[10]

2. (a) Briefly explain how the *human visual system* senses *colour*. How is *colour exploited* in the *compression* of multimedia *graphics*, *images* and *video*?

[5]

(b) List **three** distinct *models* of *colour* used in multimedia. *Explain* why there are a number of *different colour models* exploited in multimedia data formats.

[9]

(c) Compression of colour has been exploited since analog video. How was colour compression achieved in *analog video*? Compare this colour compression technique to those used in *digital video*.

[13]

3. (a) What is the distinction between *lossy* and *lossless* data compression? [2]

(b) Briefly outline the JPEG compression pipeline and the constituent compression algorithms employed at each stage in the pipeline. [12]

(c) (i) Apply *differential pulse code modulation* to compress the following stream of integer numbers:

8 7 4 6 3 4 5 6

If *only 3 bits* are used in the compressed stream encode what problems if any will occur with the above coding? [6]

(ii) Apply *run length encoding* to compress following stream of alphabetical tokens:

ABBAARNOOGOODEEEHHHHH

Comment on the *efficiency* of RLE compression on the above token stream. [7]

4. (a) What is MIDI? [2]

(b) How is a basic MIDI message structured? [4]

(c) What features of MIDI make it suitable for multimedia applications? Briefly justify your answer. What are the drawbacks of MIDI? [8]

(d) How is MIDI used within the MPEG-4 audio compression standard? [13]