
UNIVERSITI SAINS MALAYSIA

Stamford College

First Semester Examination
2004/2005 Academic Session
October 2004

**External Degree Programme
Bachelor of Computer Science (Hons.)**

CMT211 – Multimedia Systems

Duration : 2 hours

INSTRUCTION TO CANDIDATES:

- Please ensure that this examination paper contains **THREE** questions in **FOUR** printed pages before you start the examination.
 - Answer **ALL** questions.
 - This is a Closed Book Examination.
 - On each page, write *only your **Index Number***.
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1. (a) For each of the following animation, what types of animation would be more suitable? Explain why?

- (i) A corporate logo moving from left to right.
- (ii) A rolling ball.
- (iii) A woman figure running.
- (iv) An advertisement banner.
- (v) An apple transforms into an orange.

(15/100)

- (b) What file format would you choose to present?

- (i) Your wedding photo in a DVD ROM.
- (ii) A comic strip cartoon drawing using 8 color in a CD-ROM multimedia system.
- (iii) Audio for CD quality.
- (iv) Audio for cross-platform file format.

Justify your choice in each case.

(15/100)

- (c) A video stream with 30 frames per second playback rate and an audio stream of stereo voice channel. If each frame consists of 160 X 120 pixels of 24 bit colors depth and the audio is sampled at 8000 Hz with 16 bit sampling. Calculate the total storage required to store the above video file for ten minutes.

(25/100)

- (d) Discuss **five (5)** different considerations that need to be taken into account in managing audio files and integrating them into multimedia projects.

(15/100)

- (e) Discuss the importance of text in a multimedia presentation. List at least **three (3)** factors that affect the legibility of text.

(15/100)

- (f) Why is source coding able to compress data at a much higher compression ratio compared to entropy coding?

(15/100)

2. The Ministry of Education would like to develop an intelligent multimedia Computer-Based Learning system to teach Multimedia System for the secondary school students.
- How do you ensure that the learning system that you are going to develop is effective? Briefly explain the learning strategies that you will use for the above system.
(20/100)
 - If artificial intelligence (knowledge-based) is to be incorporated in this system, briefly describe the intelligent functionality that you would incorporate into the system.
(15/100)
 - Using one of the hypermedia design techniques, prepare a three-level organizational structure for the above system.
(15/100)
 - What are the key issues that need to be considered when designing the navigational structure of an interactive multimedia system? What kind of navigational functions would you incorporate in this system?
(20/100)
 - Discuss six different considerations that need to be taken into account as good design principles for designing this system.
(20/100)
 - How would you determine which multimedia-authoring tool you should use for the above project?
(10/100)

3. (a) (i) Using the following string table, compress/encode the word "ABABBABCABABBA" using LZW compression algorithm.

Code	String
1	A
2	B
3	C

- (ii) Calculate the compression ratio.

(20/100)

- (b) Using a DTPN – Dynamic Timed Petri Net, sketch the following program sequence for the soccer webcast:

The webcast starts up and displays a Title screen (T_{DA}) for 5 seconds. A sports commentator comes on immediately via the first camera following the title screen, giving a summary of the teams and players (V_{DB}, A_{DB}) until the match begins 30 seconds from the beginning of the webcast. The commentator's voice can be heard throughout the webcast. The second camera located at the field provides a good view of the starting kick (V_{DC}), during the time the commentator describes the action on field, which lasts for another 60 seconds. The action then switches to the third camera (V_{DD}, A_{DD}) located at the goal at the end of that time, as the home team has scored a goal. The noise of the crowd can be heard as the commentator announces the score. The third camera is enabled for 15 seconds, after which the program returns to the commentator, and the score is overlaid on screen (T_{DE}) together with the video of the commentator (V_{DE}) for 10 seconds as he gives the summary of the match so far.

(20/100)

- (c) How do you ensure that the flow of information is synchronized during transmission over a network?

(20/100)

- (d) A Pentium IV based laptop has a 4 GB disk with 400 MB free space. How many minutes of speech can be stored, if it is in uncompressed digital form with radio quality?

(20/100)

Answer question (e) or (f).

- (e) Is QoS important from the application viewpoint or is it important from the Network Service Provider's viewpoint? Why?

(20/100)

- (f) In the RT architecture, will QoS be always guaranteed by the system? Why?

(20/100)