Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2013/2014

COURSE NAME	:	MULTIMEDIA TECHNOLOGY & APPLICATION
COURSE CODE	:	BEC 20202
PROGRAMME	:	BEJ
EXAMINATION DATE	:	JANUARY 2014
DURATION	:	2 HOURS
INSTRUCTION	:	A) ANSWER **ALL** QUESTIONS. B) WRITE **ALL** ANSWERS **USING** BLUE/BLACK INK PEN. ANY ANSWERS WRITTEN IN PENCIL WILL **NOT** BE GRADED.

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

INSTRUCTION: Write **all** answers **using** blue/black ink pen. Any answers written using pencil will **not** be graded.

Q1 Let's say you have a digital image that is 1200 x 1800 pixels. Answer (a) to (d).

(a) How big will the image be if displayed on 300 dpi monitor and 150 dpi monitor? Show your calculation in inch.

(10 marks)

(b) Conclude your findings for Q1(a).

(2 marks)

(c) Calculate the uncompressed image's size in kilobytes (KB) if it uses:

(i) RGB color mode
(ii) 8-bit Grayscale color mode

(10 marks)

(d) Conclude your findings for Q1(c).

(3 marks)

Q2 (a) Distinguish between lossy and lossless compression by giving an example.

(5 marks)

(b) The following list is a generated code using Run-length Encoding (RLE) scheme. Answer (i) to (iii).

(255, 8), (127, 4), (0, 5)

(i) Find the size in bytes for the given RLE code. Show your works.

(3 marks)

(ii) Construct its original data.

(6 marks)

(iii) Calculate its compression ratio. Show your works.

(4 marks)

(c) RLE schemes are simple and fast, but their compression efficiency depends on the type of image data being encoded. By using an example, illustrates a case where the encoding scheme did not result in a smaller file.

(7 marks)

INSTRUCTION: Write **all** answers **using** blue/black ink pen. Any answers written using pencil will **not** be graded.

Q3 (a) You are given with the following research fields.

- Auditory
- Biometrics
- Linguistics
- Acoustics

Which branch of physics that studies sound?

(2 marks)

(b) Assume that you have an audio-CD which its sampling is done at 44.1 kHz, 16-bit resolution and stereo mode. The audio-CD has 30 seconds sound clip. Answer (i) to (iii).

(i) Calculate the uncompressed audio's size in kilobytes.

(5 marks)

(ii) Discover storage space needed to store file of Q3(b)(i).

(2 marks)

(iii) Suggest bit-rate that should be supported by the system for smooth playback. Show your calculation in Mbits/sec.

(6 marks)

(iv) Now compare your findings in Q3(b)(i) to (iii) with another audio-CD that has the same amount of sound clip but the sampling is done at 5.5kHz, 8-bit resolution and mono mode. The comparison must be consist of:

- uncompressed audio's size produced,
- size of storage required and
- bit rate needed for smooth playback.

(6 marks)

(v) Then, conclude your findings based on result shown in Q3(b)(i) to (iv).

(4 marks)

INSTRUCTION: Write **all** answers **using** blue/black ink pen. Any answers written using pencil will **not** be graded.

Q4 (a) Answer (i) and (ii).

(i) If you are given the following list:

- Camcorder
- Video Cassette Recorder (VCR)
- Video capture card
- Graphic card
- Sound card

Which one is able to convert video data from analog to digital signal?

(2 marks)

(ii) List and briefly describe three (3) basic characteristics of digital video.

(6 marks)

(b) Describe in one sentence for each of the following terms.

(i) Composite video

(3 marks)

(ii) Component video

(3 marks)

(c) If you have 1-hour video with a frame size of 320 x 240 pixels, a color depth of each frame is 16 bits and a frame rate of 25 fps. Measure the uncompressed file size in Megabytes.

(11 marks)

- END OF QUESTIONS -