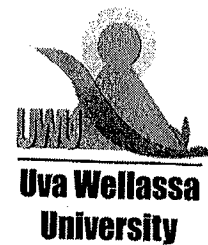


Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Computer Science and Technology
End Semester Examination September/October 2013
CST 363-2 Multimedia and Hypermedia Technology



Instructions for candidates:

Read the instructions given for questions carefully.

Answer all the questions.

This paper contains five (5) questions

Time Duration: Two (2) hours.

1.
 - a.
 - i. What is multimedia?
 - ii. Differentiate digital media from analog media.
 - iii. List the five (05) main elements in a complete multimedia system.
 - b.
 - i. Describe linear and nonlinear media.
 - ii. What is interactive multimedia?
 - iii. List five (05) uses of interactive multimedia.
 - c. Describe hypermedia and hypertext and give suitable examples.
 - d. What is an authoring tool?
 - e. Briefly describe the following terms with respect to multimedia.
 - i. Multimedia operating system
 - ii. Multimedia networking
 - iii. .jpeg and .png
 - iv. Time based media vs static media
 - v. Multimedia Authoring metaphors
 - vi. RSS and PODCAST
 - vii. Stereo and Mono

(20 Mark)

2.
 - a. Define "color theory" and list primary colors.
 - b. List four (04) color harmony schemes.
 - c. Differentiate luminance and chrominance.
 - d. Describe HSL and HSB models.

- e.
 - i. What is the step wise process in digitization?
 - ii. What is meant by resolution?

(20 Mark)

- 3.
 - a. Explain sampling theorem.
 - i. List down two types of compression methods.
 - ii. List three (03) reasons for compression.
 - b. Suppose a piece of film depicting a moving stagecoach is shot at 24 frames per second, and that the wheels are rotating at such a speed that when the film is projected at 24 frames per second the wheels appear to move backwards. What would you expect to see if the same film is projected at,
 - i. 11 frames per second?
 - ii. 40 frames per second?
 - iii. 60 frames per second?
 - c. What is the main difference between lossless and lossy compression?
 - d. List three (03) jpeg compression techniques.
 - e. Briefly explain sampling rate and sampling resolution.

(20 Mark)

- 4.
 - a. Calculate physical dimensions of following images.
 - i. 198 x 149 px in 72 dpi display
 - ii. 1654 x 1240 px in 600 dpi display
 - b. Explain downsampling and upsampling.
 - c.
 - i. What is Run Length Encoding (RLE)?
 - ii. Compress the following data using Run Length Encoding (RLE).

BBBBBBBBBAAAAAAAAAAAAAAAAANNMMMMMMMMMM

d.

- i. What is meant by Huffman Coding?
- ii. Draw the tree and determine values for each symbol.

Symbol	Frequency
A	30
B	13
C	22
D	12
E	9

- iii. Encode the following text using the above Huffman tree derived from part (ii).

EAEBACDEA

e.

- i. What is meant by animation?
- ii. List animation ingredients and explain four (04) of them.
- iii. Explain the difference between computer assisted animation and computer generated animation.

(20 Mark)

5.

- a. List steps in 3D animation and explain each step briefly.
- b. What is linear and nonlinear editing?
- c. Explain spatial and temporal redundancy.
- d. What is Streaming media and name three (03) systems required for streaming?
- e.
 - i. List three (03) advantages and disadvantages of Musical Instrument Digital Interface (MIDI).
 - ii. Solve the following questions using the Nyquist Theorem.
 - a) What sampling rate is needed for a signal with a bandwidth of 10,000Hz (1000 to 11,000Hz)?

- b) A signal is sampled. Each sample requires at least 12 levels of precision (0 to +5 and 0 to -5). How many bits should be sent for each sample?
- c) Assume that we want to digitize the human voice (The human voice normally contains frequencies from 0 to 4000 Hz.). What is the bit rate, assuming 8 bits per sample?

(20 Mark)