BITS Pilani, Dubai Campus, Academic City, Dubai.

Comprehensive Examination **Question Paper**

IV Year I Semester 2011-2012

Degree: B.E.(Hons.) Branch: C.S./EEE/ECE

Course No : EA C473 Course Title: Multimedia Computing

Date: 11/01/2012 Wednesday Time: 3 hours Total marks: 80

Weightage: 40% Data provided are complete. ***Closed Book***

This question paper has 2 pages.

Answer **all** Questions.

1. What are the elements of an INFORMATION EXCHANGE MEDIUM? [2M]

2. What is the basic principle in GIF Interlaced Mode ? [2 M]

3. Distinguish between an AUDITORY DISPLAY and TACTILE DISPLAY.[2M]

4. Draw the diagram corresponding to the AUDIO STREAM in MPEG 1. [2M]

5. What is *Intra-Object* Synchronization? Give an example. [2 M]

6. What is PASS MODE in digitized documents ? [2M]

7. The following is the quantized sequence of Samples for an audio signal.

   22, 24, 24, 28, 28, 28, 25, 26, 26, 26, 21, 19, 20, 20, 22, 24, 24, 24, 23, 24, 20, 16, 10, 10, 8, 11, 6, 9, 9, 12, 15, 19

   Encode the quantized sequence using DPCM. [2M]

8. Write a brief technical note on any two CHROMA SUBSAMPLING Schemes w.r.t. digital video..

   [5M]

9. Draw the diagram for TELEPHONY over the INTERNET w.r.t. interpersonal communications. [5 M]

10. Explain DITHERING & ANTI-ALIASING in images. [6 M]

P.T.O.

11. Explain the following w.r.t. to Compact Disk Digital Audio (CD-DA):
a) principles involved in Eight-to-Fourteen Modulation [5M]
b) Frames, Tracks, Areas and Blocks [5M]

12.The following **intensity values** in an image are to be transmitted using HUFFMAN CODING:

120	60	50	30	4	3	1	0
60	50	30	3	4	1	0	0
50	50	6	6	5	0	0	0
50	6	5	5	5	0	0	0
5	4	3	0	0	0	0	0
3	2	3	0	0	0	0	0
1	1	0	0	0	0	0	0
0	0	0	0	0	0	0	0

Construct the HUFFMAN Coding Tree step by step for the above **intensity values** present in the above image and *determine* the number of bits required to code each intensity value. [10 M]

13.Write algorithm (basic steps or pseudo-code) to accomplish each of the following functions:
a) ARITHMETIC CODING ENCODER
b) ARITHMETIC CODING DECODER

[5+5 M]

14.Draw the **QUICKTIME Architecture** Diagram and explain the function of each of its subsystems / components.

[5+5 M]

15. [5+5M]
a) Draw the schematic (block diagram) for JPEG ENCODER.
b) Draw the schematic (block diagram) for JPEG DECODER.

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IV Year I SEMESTER 2011-2012

Degree: B.E. (Hons.) Elective V Branch: CS/EEE/ECE

TEST II **Question Paper**

Course No : EA C473 Course Title: Multimedia Computing

Date: 18, DEC., 2011 Sunday Time: 50 min. Total marks: 20

Data provided are complete. **OPEN** ***Book***.

Text Books / REFERENCE BOOK and Class notes permitted.

This question paper has **two** pages.

Answer all Questions.

1. What can you infer from the **level of annoyance** graph in POINTER SYNCHRONIZATION? [2 M]

2. Distinguish between CONTENT RELATION and SPATIAL RELATION in Synchronization. [2 M]

3. What do the PROFILES and LEVELS in MPEG-2 indicate? [2 M]

4. What are the components specified in MPEG-4 standard? [2 M]

P.T.O.

5. Consider the transmission of a message comprising a string of characters. The probabilities of each character is given below:

p(**I**)=0.40 p(**N**) = 0.30 p(**U**) = 0.20 p(**X**) = 0.10

Using ARITHMETIC CODING,

a) **Encode** the string UNIX

b) **Decode** 0.5412 [into a 4 letter string]

[6 marks]

6.**Construct Table II** for dictionary-based LZW Compression Algorithm as shown below (algorithm need not be written; **only the table entries are to be filled for successive steps as necessary**).

Let the STRING TABLE (dictionary) initially contains only 2 characters with codes as shown in Table 1.

Table 1

Code	String
1	P
2	Q

If the Input String is **QQQQQPPPPQQQPPPQQPPQPPPQ**
write the output codes for this input string.

TABLE II

s	**c**	**output**	**code**	**string**
			1	P
			2	Q
...	...	...	...	...
...	...	...	...	...

(Draw this table with as many rows, as necessary)

[6 M]

BITS, Pilani – Dubai Campus, Academic City, Dubai.

IV Year FIRST SEMESTER 2011-2012

Degree: B.E. (Hons.) Branch: C.S./ EEE / ECE

TEST I Question Paper

Course No : EA C473 Course Title: Multimedia Computing

Date: 23, October, 2011 Sunday Time: 50 min. Total marks: 25

Data provided are complete. **Closed** ***Book***.

This question paper has one page.

Answer all Questions.

1.Draw the diagram for the following Chroma Subsampling Scheme w.r.t. digital video: **4:4:4** [3 M]

2. Write a brief technical note on In-Between Process in Animation. [3 M]

3. The following problem relates to the **dimensions of a compressed image** using JPEG format:

You are given the following data: X_max = 1280 pixels ; i.e. the maximum of all X_i.
Y_max= 1024 pixels; i.e. the maximum of all Y_i.
H_max=4 i.e. Maximum Horizontal sampling ratio.
V_max=4 i.e. Maximum Vertical sampling ratio.

Now **calculate (X_i,Y_i)** for each of the following pairs of (H_i, V_i) :

H_i	V_i	X_i	Y_i
2	1		
4	1		
2	4		
1	2		
4	2		
1	4		
2	2		
4	4		

Here, (H_i, V_i) refer to relative horizontal and vertical sampling ratio for each component . [4 M]

4. Explain a Heterogeneous Multimedia Query with an example scenario. [4 M]

5. Draw the block schematic (diagram) for REMOTE LECTURE pertaining to SPEECH-and-VIDEO Interpersonal Communication. [5 M]

6. The following character string is to be transmitted using HUFFMAN CODING:

AGLANCEATTHEJPEGBITSTREAMSHOWSFRAMESCANSEGMENTBLK

Construct the HUFFMAN Coding Tree for the letters present in the above string and *determine* the number of bits required to code each letter. [6 M]

BITS, Pilani – Dubai Campus Academic City, Dubai.
IV Year I Semester 2011-2012
Degree: B.E. Hons. Branch: C.S./EEE/ECE
Elective V QUIZ II
Course No : EA C473 Course Title: Multimedia Computing
Date: 05/12/2011 Monday Time: 20 min. Total marks: 06
Weightage: 3% Venue : As per seating arrangement ***Closed Book***.
This question paper has 2 pages [use backside for rough work]
(assignment carries 4% weightage)

IDNO: **Name:**

SET B

Write answers in the space provided in question paper. Answer all questions.

1. Differentiate between ICON and MICON in a multimedia Interface. [1 mark]

2. Using B-frames, the order of images in a MPEG-coded stream differs from actual decoding order.

*If the **Display Order*** is

Type of frame:	B	B	I	B	B	P	B	B	P
Frame Number:	0	1	2	3	4	5	6	7	8

Write down the DECODING ORDER. [1 M]

3. What is Auditory Masking in MPEG-1? [1 M]

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Date: 05/12/2011 Monday Time: 20 min. Total marks: 06
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(assignment carries 4% weightage)

IDNO: **Name:**

SET B

4. What is the function of **Macro** class in MHEG class hierarchy? [1M]

5. What are the subclasses of ***Behavior*** class in MHEG class hierarchy? [1M]

6. What are the factors considered for AESTHETICS in a multimedia user interface? [1 M]

BITS, Pilani – Dubai Campus Academic City, Dubai.
IV Year First Semester 2011-2012
Degree: B.E. Hons.
QUIZ I SET A
Course No : EA C473 Course Title: Multimedia Computing
Date: 26, Sep., 2011 Monday Time: 20 min. Total marks: 08
Weightage: 8% Venue : As per seating arrangement ***Closed Book***.
This question paper has 2 pages

IDNO: Name:

Write answers in the space provided in question paper. Answer all questions.
Note:_____ means one or more words to be filled within a line.

1. What is *Asynchronous Transmission Mode* w.r.t. Multimedia systems ? [1 M]

2. What is Symbolic Image Data Transmission? [1 M]

3. Draw the diagram w.r.t. GRANULARITY of a motion picture sequence (assume uncompressed video sequence consisting of individual video clips). [2 M]

ROUGH WORK ONLY in this space [**p.t.o** after finishing this page]

BITS, Pilani – Dubai Campus Academic City, Dubai.
IV Year First Semester 2011-2012
Degree: B.E. Hons.
QUIZ I SET A
Course No : EA C473 Course Title: Multimedia Computing
Date: 26, Sep., 2011 Monday Time: 20 min. Total marks: 08
Weightage: 8% Venue : As per seating arrangement ***Closed Book***.
This question paper has 2 pages
IDNO: Name:

4. Give an example for CHANNEL VOICE MESSAGE in MIDI. [1 M]

5. In Amplitude Envelop for MIDI, the time from *no sound* to *maximum amplitude* is called _____. [1 M]

6. A photograph of (**6** X **8** inches) is scanning in **300 dpi** resolution and **24 bit colour** (per pixel). The image is then saved in a JPEG file with **1:20** compression ratio. It is then used on a web page. If a viewer connecting to internet uses a modem of transfer rate **2048 Kilobits / sec**., how long will it take to download the compressed image to his/her computer? [2 M]

ROUGH WORK ONLY in this space