

BITS Pilani, Dubai Campus, Academic City, Dubai.

Comprehensive Examination Question Paper

I Semester 2013-2014

Degree: B.E.(Hons.)

Course No : EA C473 Course Title: Multimedia Computing

Date: 05/01/2014 Sunday Time: 3 hours AN Total marks: 40

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

This question paper has 2 pages.

Answer all Questions.

1. What are the basic steps in the JPEG compression process? [2 M]
2. What is VIEW-SPECIFIC and SIMULTANEOUS DATA ACCESS in an MDBMS? [2 M]
3. What are the functions of MACRO CLASS in MHEG CLASS HIERARCHY? [2 M]
4. Write in brief the following w.r.t. Compact Disk Digital Audio (CD-DA):
Areas: Lead-In, Program and Lead-Out. [2 M]
5. Write an algorithm (steps or pseudo code) for LZW Decompression. [2 M]
6. Tabulate, in the form of a Table, the **Interface Abstraction & Tasks** performed in Media layer in Synchronization Reference Model (as shown below). [2 M]

Layer	Interface Abstraction	Tasks
MEDIA LAYER		

7. What is Symbolic Image Data Transmission? [2 M]
8. What are the components of a MIDI (musical instruments digital interface) SYNTHESIZER device? [2 M]
9. Discuss the methods for Controlling Animation. [3 M]
10. Draw the block schematic for the MPEG-4 Functional Partition. [3 M]
11. Write a technical note on each of the following Multimedia Service Classes: [3 M]
 - a. Real-Time
 - b. Priority Data
 - c. Silver
 - d. Best Effort
 - e. Bronze

P.T.O.

EA C473 Multimedia Computing.... Question paper

12. Explain Tele-action services w.r.t. MEDIA COMMUNICATION.

[4 M]

13. Draw the QUICKTIME Architecture Diagram w.r.t. Multimedia OS.

[5 M]

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

$p(C)=0.40$ $p(E) = 0.30$ $p(R) = 0.20$ $p(T) = 0.10$

Using **ARITHMETIC CODING**,

a) **Encode** the string RECT

b) **Decode** 0.2552 [into a 4 letter string]

[6 M]

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BITS Pilani, Dubai Campus Academic City, Dubai.

IV Year FIRST SEMESTER 2013-2014

Degree: B.E. (Hons.)

TEST II Question Paper

Course No : EA C473 Course Title: Multimedia Computing

Date: 06, Nov., 2013 Wednesday 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. **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 3 characters with codes as shown in Table 1.

Table 1

Code	String
1	I
2	M
3	N

If the Input String is MINMINMINMINMINMINIMNIMNMMNINM
write the output codes for the above input string (ENCODING).

TABLE II

s	c	output	code	string
			1	I
			2	M
...	3	N
...

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

[6 M]

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

$$p(\mathbf{A})=0.40 \quad p(\mathbf{H})=0.30 \quad p(\mathbf{P})=0.20 \quad p(\mathbf{T})=0.10$$

Using ARITHMETIC CODING,

- Encode the string PATH
- Decode 0.5550 [into a 4 letter string]

[6 M]

P.T.O.

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

You are given the following data: $X_{max} = 800$ pixels ; i.e. the maximum of all X_i .
 $Y_{max} = 600$ 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	400	150
4	1	800	150
2	4	400	600
1	2	200	300
4	2	800	300
1	4	200	600
2	2	400	300
4	4	800	600

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

4. **Design of a multimedia user interface**

You are planning to design a multimedia user interface for the following software application "HOW TO LEARN CAR DRIVING". Explain the design issues w.r.t. developing the above application. [4 M]

- 1) info. content
- 2) char of info. rep.
- 3) communicative intent
- 4) choose media
- 5) coordinate diff media.
- 6) interactive exploration of info

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FIRST SEMESTER 2013-2014

Degree: B.E. (Hons.)

TEST I Question Paper

Course No : EA C473 Course Title: Multimedia Computing

Date: 02/10/2013 Wednesday Time: 50 min. Total marks: 25

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

This question paper has one page.

Answer all Questions.

1. Distinguish between OPEN LDU and CLOSED LDU (note: LDU: Logical data Unit). [2 M]
2. Mention the different ways in which the data Stream characteristics for continuous media classified according to:
 - a) DATA SIZE.
 - b) Time intervals between complete transmission of consecutive packets. [2 M]
3. What are the maximum Data Rates for Noiseless and Noisy Channels? [3 M]
4. A multimedia presentation has 25 minutes of CD-Quality Digital Audio in .wav files. Given the following parameters for CD-DA,
Sample Frequency : 44.1 KHz
Quantization : 8 bits / sample
No of Channels = 1 (assume Mono)
What is the storage capacity required for these files in MB ? [2 M]
5. A photograph of (7 X 9 inches) is scanning in 400 dpi resolution and 24 bit colour (per pixel). The image is then saved in a JPEG file with 1:18 compression ratio. It is then used on a web page. If a viewer connecting to internet uses a modem of transfer rate 64 Kilobits / sec., how long will it take to download the compressed image to his/her computer? [3 M]
6. How are the MIDI messages classified? (just mention the categories) [3 M]
7. Write brief Technical Note on **Labeling** in Image recognition. [3 M]
8. The following character string is to be transmitted using HUFFMAN CODING:

THEOPERATIONSMANAGEMENTCONTROLS

Construct the HUFFMAN Coding Tree for the letters present in the above string and *determine* the number of bits required to code each letter. [7 M]

BITS Pilani – Dubai Campus Academic City, Dubai.
III/IV Year I Semester 2013-2014
Degree: B.E. Hons. *Elective QUIZ II*
Course No : EA C473 Course Title: Multimedia Computing
Date: 9/12/13 Monday Time: 20 min. (1-1.20) Total marks: 06
Weightage: 3% Venue : 245 *Closed Book*.
This question paper has 2 pages [use backside for rough work]

SET A

IDNO:

Name:

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

1. Give an example scenario for a heterogeneous multimedia query. [1 M]

2. What is “Spatial Relations” in synchronization? [1 M]

3. What is Component Relation in a multimedia database system? [1 M]

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This question paper has 2 pages [use backside for rough work]

SET A

IDNO:

Name:

4. What is an “OPEN LDU” in synchronization? [1 M]

5. Give an example for “Descriptive and Content Oriented Search” in a multimedia database system? [1 M]

6. Define ‘Pointer Synchronization’. [1 M]

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SET A

IDNO:

Name:

4. What is an “OPEN LDU” in synchronization?

[1 M]

5. Give an example for “Descriptive and Content Oriented Search” in a multimedia database system?

[1 M]

6. Define ‘Pointer Synchronization’.

[1 M]

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First Semester 2013-2014

Degree: B.E. Hons.

QUIZ I (SET A)

Course No : EA C473 Course Title: Multimedia Computing

Date: 23, Oct., 2013 Wednesday Time: 20 min. Total marks: 08

Weightage: 8% Venue : 245 *Closed Book*.

This question paper has 2 pages [back to back]

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. Draw the layout for the Chroma Sub sampling scheme 4:2:0.

2 M

2. MHEG stands for _____.

1 M

3. What is Composite Video?

1 M

4. What is the function of the BEHAVIOR CLASS in MHEG ?

1 M

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First Semester 2013-2014

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QUIZ I (SET A)

Course No : EA C473 Course Title: Multimedia Computing

Date: 23, Oct., 2013 Wednesday Time: 20 min. Total marks: 08

Weightage: 8% Venue : **245 Closed Book.**

This question paper has 2 pages [back to back]

IDNO:

Name:

5. What is a Hypermedia System ? Mention an example. 1 M

6. Distinguish between Motion Dynamic and Update Dynamic w.r.t. Visual effect in Animation. 2 M