

BITS Pilani, Dubai Campus, Academic City, Dubai.

Comprehensive Examination Question Paper

IV Year I Semester 2012-2013

Degree: B.E.(Hons.)

Course No : EA C473 Course Title: Multimedia Computing

Date: 08/01/2013 Tuesday Time: 3 hours Total marks: 80

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

This question paper has 2 pages.

Answer **all** Questions.

1. Mention the names of the components of a MIDI (musical instruments digital interface) SYNTHESIZER device. [2 M]
2. Draw the diagram w.r.t. GRANULARITY of a motion picture sequence (assume uncompressed video sequence consisting of individual video clips). [2 M]
3. Mention the names of the layers in the MULTIMEDIA SYNCHRONIZATION REFERENCE MODEL. [2 M]
4. What are the requirements to consider in the design of a QUERY LANGUAGE to handle multimedia content? [2 M]
5. In JPEG, Why is DIFFERENTIAL ENCODING is used for compression of DC coefficients in successive blocks? [2 M]
6. Distinguish between BITMAP and VECTOR GRAPHIC. [4 M]
7. Explain in brief the following QOS parameters w.r.t. multimedia data transmission:
 - a) Data Rate
 - b) Latency
 - c) Jitter
 - d) Best Effort Service Class [4 M]
8. Draw the diagram corresponding to the VIDEO DATA STREAM in MPEG-1. [5M]
9. What are the functions performed by the following entities in QUICKTIME architecture
 - a) The Movie Toolbox
 - b) The Image Compression Manager
 - c) The Component Manager ? [6 M]

P.T.O.

10. Explain in brief the following types of video signals:
 a) COMPONENT VIDEO b) COMPOSITE VIDEO c) S-VIDEO [2+2+2 M]

11. Write a technical note on Scalability Modes of MPEG-2 standard. [7 M]

12. Write a technical note on different types of optical disks. [8 M]

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

$$p(\mathbf{K})=0.35 \quad p(\mathbf{N}) = 0.30 \quad p(\mathbf{O}) = 0.20 \quad p(\mathbf{W}) = 0.15$$

Using ARITHMETIC CODING,

a) **Encode** the string *KNOW*

b) **Decode** 0.6540 [into a 4 letter string]

[10 M]

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

XLAVBRBE076961455829VBRBE07LAVBRBE5829V5829V5829V5829V0000

Construct the HUFFMAN Coding Tree for the letters present in the above string and *determine* the number of bits required to code each letter. [10 M]

15. **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	A
2	N
3	D

If the Input String is

ANDNANDNANDNANDNANDANDNANDNANDANDANAN write the output codes for this input string.

TABLE II

s	c	output	code	string
			1	A
			2	N
			3	D
.....

[10 M]

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

IV Year FIRST SEMESTER 2012-2013

Degree: B.E. (Hons.) TEST II Question Paper

Course No : EA C473 Course Title: Multimedia Computing

Date: 12, DEC., 2012 Wednesday Time: 50 min. Total marks: 20

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

Text Books / REFERENCE BOOK and Student's own handwritten class notes permitted.

This question paper has one page.

Answer all Questions.

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

THEUNIXOSORIGINATEDATBELLLABSSUPPORTSMULTITASKINGG

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

2. Discuss The MHEG Class Hierarchy with reference to any specific application of your interest. [4 M]
3. Consider a Multimedia Database for an University Students' Information System. **Specify** a heterogeneous query [involving multiple media] for the above database. [3 M]
4. What can you infer from the results of the experiments on QOS parameters for LIP Synchronization? [3 M]
5. Find SSD [sum of squared differences] correlation and SAD [sum of absolute differences] correlation for the following data w.r.t. MPEG-1 frames:

MATCH WINDOW [macro-block]	SEARCH WINDOW
7 9 6	6 10 7
5 4 6	4 5 7
9 8 2	10 7 3

[3 M]

BITS Pilani, Dubai Campus, Academic City, Dubai.
IV Year FIRST SEMESTER 2012-2013

Degree: B.E. (Hons.)

TEST I Question Paper

Course No : EA C473 Course Title: Multimedia Computing

Date: 24, October, 2012 Wednesday 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: **4:2:2** [3 M]

2. Discuss the following methods for controlling Animation: [6 M]
 - a) FULL EXPLICIT CONTROL
 - b) PROCEDURAL CONTROL
 - c) TRACKING LIVE ACTION

3. Consider the transmission of a message comprising a string of characters. The probabilities of each character is given below:
 $p(\mathbf{E})=0.35$ $p(\mathbf{I}) = 0.30$ $p(\mathbf{N}) = 0.20$ $p(\mathbf{V}) = 0.15$
Using ARITHMETIC CODING,
 - a) Encode the string VEIN
 - b) Decode 0.4510 [into a 4 letter string][6 M]

4. What are the main aspects that you will consider in the design of a multimedia user interface? [3 M]

5. Explain MCUs (minimum coded units) in JPEG standard involving 4 components. (4 M)

6. Explain RUN LENGTH ENCODING with an example. [3 M]

BITS Pilani – Dubai Campus Academic City, Dubai.
IV Year II Semester 2012-2013
Degree: B.E. Hons. Branch: C.S./EEE/ECE/BIOTECH
Elective QUIZ II
Course No : EA C473 Course Title: Multimedia Computing
Date: 23/12/2012 Sunday 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]

IDNO:

Name:

SET A

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

1. Define the following w.r.t. MEDIA PREPARATION: [2 M]
 - a) Audio Support

 - b) Video Support

2. Define the following w.r.t. MEDIA COMMUNICATION: [2 M]
 - a) Conversational service

 - b) Tele-action, tele-operation service

3. Define the following w.r.t. MEDIA ENTERTAINMENT: [2 M]
 - a) Virtual Reality

 - b) Video on Demand

BITS Pilani, Dubai Campus, Academic City, Dubai.
IV Year First Semester 2012-2013
Degree: B.E. Hons. Branch: C.S. / EEE / MECH / EIE / BIOTECH / ECE
QUIZ I A

Course No : EA C473 Course Title: Multimedia Computing
Date: 25, Sep., 2013 Tuesday Time: 20 min. Total marks: 08
Weightage: 8% Venue : 223 **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. What is a REPRESENTATION MEDIUM ? [1 M]

2. What is a Weakly Periodic Data Stream ? [1 M]

3. A multimedia presentation has 36 minutes of CD-Quality Digital Audio in .wav files.
Given the following parameters for CD-DA,
Sample Frequency : 44.1 KHz
Quantization : 16 bits
No of Channels = 2 (assume stereo)
What is the storage capacity required for these files in MB ? [1.5 M]

ROUGH WORK ONLY in this space

[p.t.o after finishing this page]

Course No : EA C473 Course Title: Multimedia Computing
Date: 25, Sep., 2013 Tuesday Time: 20 min. Total marks: 08
Weightage: 8% Venue : 223 **Closed Book.**
This question paper has 2 pages [back to back]

IDNO: _____

Name: _____

4. What is an Instrument Patch in MIDI?

[1 M]

5. In Amplitude Envelop for MIDI, the Phase where time envelop will stay at peak level before starting the Decay is called _____.

[0.5 M]

6. A photograph of (10 X 12 inches) is scanning in 400 dpi resolution and 16 bit colour (per pixel). The image is then saved in a JPEG file with 1:16 compression ratio. It is then used on a web page. If a viewer connecting to internet uses a modem of transfer rate 512 Kilobits / sec., how long will it take to download the compressed image to his/her computer?

[2 M]

7. What is Labeling in Image Recognition?

[1 M]

ROUGH WORK ONLY in this space