BITS Pilani, Dubai Campus, Academic City, Dubai.
Comprehensive Examination **Question Paper**
IV Year   II Semester   2011-2012

Degree: B.E.(Hons.)   Branch: C.S./EEE/ECE
Course No : EA C473   Course Title: Multimedia Computing
Date: 14/04/2012 Thursday   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 is Granularity of Logical Data Units ? Give an example. [2M]

2. Distinguish between Multimedia and Hypermedia.   [2 M]

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

4. How can you provide CONTEXT-SENSITIVE help functions in a multimedia user interface?   [2 M]

5. Define the following characteristics of a Multimedia DBMS: [4 M]
   a) View-Specific and Simultaneous Data Access.
   b) Relational Consistency of Data Management.
   c) Format-Independent Interface.

6. Mention the main areas of application of MPEG-2 and MPEG-4 standards. [4 M]

7. What is FULL Explicit Control in Animation ? Mention an example
                                              in this category.   [4 M]

8. The following Table refers to JPEG QUANTIZATION STEP w.r.t.
   LUMINANCE data. Fill UP the last row entries in your answer sheet.
                                                                  [4 M]

DCT coefficients before quantization	192	100	84	40	80	100	120	140
Quantization table entries	4	10	4	8	5	20	3	2
DCT coefficients after quantization								

9. Draw the diagram corresponding to the VIDEO DATA STREAM in MPEG 1. [5M]
P.T.O.

10. Draw the **QUICKTIME Architecture** Diagram.

[5 M]

11. Explain in brief the following QOS parameters w.r.t. multimedia data transmission:

- Data Rate
- Latency
- Packet Loss or Error
- Jitter
- Sync Skew
- Best Effort Service Class

[6 M]

12. Explain the stages for developing a multimedia application using an Authoring System.

[10 M]

13. Write an algorithm (steps or pseudo code) for each of the following:
    a) LZW Compression. [10 M]
    b) LZW Decompression.

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

p(E)=0.40   p(**H**) = 0.30   p(**N**) = 0.20   p(**W**) = 0.10

Using ARITHMETIC CODING,
a) **Encode** the string WHEN
b) **Decode** 0.6410 [into a 4 letter string]

[10 M]

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

IMAGECOMPRESSIONSTANDARDMAINSTEPINIMAGECOMPRESSION

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]

BITS Pilani, Dubai Campus Academic City, Dubai.
IV Year SECOND SEMESTER   2011-2012
Degree: B.E. (Hons.) Branch: C.S. / EEE / ECE
TEST II Question Paper
Course No : EA C473   Course Title: Multimedia Computing
Date: 24, April., 2012 Tuesday   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 two pages.

Answer all Questions.

1. What is the need for PROFILES and LEVELS in MPEG-2 standard?   [2 M]

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

$p(G)=0.35$ $p(I) = 0.25$ $p(N) = 0.25$ $p(S) = 0.15$

   Using ARITHMETIC CODING,
   a) Encode the string SIGN
   b) Decode 0.7510 [into a 4 letter string]

                                                                            [6 marks]

3.**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	A
2	B

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

TABLE II

s	c	output	code	string
			1	A
			2	B
...	...	...	...	...
...	...	...	...	...

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

                                                                            6 M
P.T.O.

4.Find SSD & SAD [sum of squared differences & sum of absolute differences] and correlation for the following data pertaining to MPEG-1 P-Frames:

MATCH WINDOW [macro-block]					SEARCH WINDOW			
17	15	17	18		17	16	15	18
17	17	18	12		6	17	19	13
18	18	16	15		10	18	15	14
19	12	16	25		9	11	16	23

[2 + 1 M]

5. Mention *2 practical applications (i.e. 2 real time examples)* for **each** of the following w.r.t. Synchronization in multimedia systems:
a) Content Relations   b) Temporal Relations.   [2 M]

6.What is the advantage of OBJECT BASED CODING in   MPEG-4 standard?
[1 M]

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BITS Pilani, Dubai Campus, Academic City, Dubai.
IV Year   II 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: 06, March, 2012 Tuesday   Time: 50 min.   Total marks: 25
Data provided are complete. **Closed** *Book*.
This question paper has one page.
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Answer all Questions.

1.Draw the diagram for the following Chroma Subsampling Scheme
w.r.t. digital video: **4:2:0**   [3 M]

2. Explain in brief, with an example, each of the following Transmission Modes w.r.t.
Data Streams:
a) ASYNCHRONOUS TRANSMISSION MODE
b) SYNCHRONOUS TRANSMISSION MODE
c) ISOCHRONOUS TRANSMISSION MODE   [3 M]

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

4. a) A photograph of (**6 X 8** inches) is scanning in 300 dpi   resolution   and 24 bit
color (i.e. resolution in bits/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   1024 Kilobits / sec., how long will it take   to download the
compressed image to his/her computer?

                                                                    [3 M]
   b) What is Symbolic Image Data Transmission?   [2 M]

5. Explain the functions performed by components of a MIDI   Synthesizer device.
                                                                    [5 M]

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

SPECIFICATIONLAYERBEFOREPICTURECANBEPROCESSEDDIGIT

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.
III Year   Second   Semester   2011-2012
Degree: B.E. Hons. Branch: C.S.
QUIZ II
Course No : CS C352   Course Title: Data Base Systems
Date: 17/2/12 Tuesday   Time: 20 min.   Total marks: = 6
Weightage: 3%   Venue : seating arrangement *Closed Book*.
This question paper has 2 pages [use *back page* for *rough work* only]
Note: SQL assignment carries 4% weightage

IDNO: **Name:**

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

1. Define Rotational Latency w.r.t. hard disks.   [1 M]

2. Distinguish between Primary Index and Secondary Index. [1.5 M]

BITS Pilani Dubai Campus, Academic City, Dubai.
III Year Second Semester   2011-2012
Degree: B.E. Hons. Branch: C.S.
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Course No : CS C352   Course Title: Data Base Systems
Date: 17/2/12 Tuesday   Time: 20 min.   Total marks: = 6
Weightage: 3%   Venue : seating arrangement *Closed Book.*
This question paper has 2 pages [use *back page* for *rough work* only]
Note: SQL assignment carries 4% weightage
IDNO: **Name:**

SET A

3. What is the difference between a B-Tree and B+ Tree?   [1.5 M]

4. Consider a Disk Block whose size is 1024 bytes. The record consists of two fields IDNO (string 10 chrs) and NAME (string 54 chrs). How many disk blocks are needed to store 18000 records?   [2 M]