BITS, Pilani – Dubai Campus, Knowledge Village, Dubai.

IV Year First Semester 2005-2006

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

Comprehensive Examination Question Paper

Course No : EA UC473 Course Title: Multimedia Computing

Date: 05, Jan., 2006 Thursday Time: 10 a.m.- 1 Noon Total marks: 60

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

Part A Answer **all** Questions. 10*2=20 marks

1. Draw the diagram showing the GRANULARITY of a motion picture sequence [uncompressed video].
2. What are the elements of an INFORMATION EXCHANGE MEDIUM?
3. Write the equations corresponding to the component division for YUV signal.
4. What approaches are used for the *transmission* of *animation* over computer networks ?
5. What is the basic principle in GIF Interlaced Mode ?
6. What is the function of INTERACTION CLASS in MHEG CLASS HIERARCHY?
7. Mention the names of the basic steps in the JPEG compression process.
8. Draw the diagram corresponding to the AUDIO STREAM in MPEG.
9. Distinguish between an AUDITORY DISPLAY and TACTILE DISPLAY.
10. What is VIEW-SPECIFIC and SIMULTANEOUS DATA ACCESS in an MDBMS?

Part B. Answer all questions.

11. Draw the **QUICKTIME Architecture** Diagram and explain its various components and their functions. [5 marks]

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

p(A)=0.20 p(E) = 0.25 p(M) = 0.15 p(R) = 0.30 p(S)=0.10

Using ARITHMETIC CODING,

a) Encode the string **MARS**

b) Decode 0.2052 [into a 4 letter string] [10 M]

13. Explain with appropriate diagrams the basic operation of MOVIE/VIDEO-ON-DEMAND. [5 marks]

14. Explain with appropriate diagrams the principle of CD-WO [compact disk write once] and Disk Layout of a "Hybrid Disk" with several SESSIONS. [5 marks]

15. Write in the form of a TABLE showing the LAYER, INTERFACE ABSTRACTION and TASKS in synchronization reference model. The 4 layers to be considered are: *Specification, Object, Stream* and *Media.* [5 marks]

16. a) A photograph of (**6** X **8** inches) is scanning in 300 dpi resolution and 8 bit colour. 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 256 Kilobits / sec., how long will it take to download the compressed image to his/her computer? [3 marks]

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

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

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TEST II Question Paper

Course No : EA UC473 Course Title: Multimedia Computing

Date: 11, Dec., 2005 Sunday Time: 8.00 am.- 8.50 am Total marks: 20

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

1. Explain the elements of the *Multimedia Document Architecture* **w.r.t.** the following **Application**: ONLINE LEARNING SYSTEM for the Course EAUC473 – MULTIMEDIA COMPUTING. 5 marks.

2. Write briefly,
   a) three practical applications that make use of LIVE SYNCHRONIZATION.
   b) three practical applications that make use of SYNTHETIC SYNCHRONIZATION.. 1.5+1.5 marks.

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

   p(A)=0.40 p(T) = 0.35 p(R) = 0.25

   Using ARITHMETIC CODING,
   a) Encode the string: **ART**
   b) Decode 0.6410 (i.e., into a 3 character string)
   c) Encode the string: **TAR**

   [6 marks]

4. What psychoacoustic principles does MPEG use to compress audio files ? [2 marks]

5. Write down the RUN-LENGTH CODED OUTPUT (compressed) for the following uncompressed data:

   abcddddddcbbbbabcdefabcddddddcbbbbabcdefabcddddddcbbbbabcdefabcddddddcbbbbabcdef

   [2 marks]

6. What is the need for 4 types of image coding, for processing in MPEG ? [2 marks]

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TEST I Question Paper

Course No : EA UC473 Course Title: Multimedia Computing

Date: 23, Oct., 2005 Sunday Time: 8.00 am.- 8.50 am Total marks: 20

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

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1. **Find** the **AUDIO DATA RATE** in KB/sec. for **CD-DA** for the following input data:
   - 16 BIT Linear Quantization
   - 2 channels
   - 44100 samples / second for each channel.

   What will be the TIME required to transmit a **2 minutes** portion of the above audio data using a Transmission Channel of bit rate **2 Mbps**? [1+1]

2. Explain the VARIATION of CONSECUTIVE PACKET AMOUNT in Data Streams. [3 marks]

3. What is FLICKER EFFECT? What is the function of a DISPLAY REFRESH BUFFER ? [2]

4. What is a SPACE-BALL ? What is its function ? [2]

5. Assume the contents of a file that consists of 256 different words – each composed of alphanumeric characters from the basic ASCII character set – is to be sent over a network using LZW algorithm. If the file contents start with the string:
   THIS IS EASY AS IT IS EASY .....
   Show diagramatically, the *entries in the dictionary* of the *Encoder* up to this point and the string of *code- words* that are sent [3 marks].

6. The relative frequency of 10 letters are given below:

Letter	I	M	Y	U	C	N	O	T	A	B
Rel. Frequency	24	7	2	32	38	43	44	120	140	2

   a) **Construct** the *HUFFMAN Coding Tree* step by step for the above letters.
   b) **Write** the *Huffman Code* for each letter.
   c) **Encode** the following string "BOAT" using the above scheme. [5 marks]

7. Define a) ROTOSCOPING b) GKS c) MONOPHONY [3 marks]