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

IV Year First Semester 2003-2004

Degree: B.S. Branch: C.S.E.

Comprehensive Examination Question Paper

Course No : EA UC473 Course Title: Multimedia Computing

Date: 11, Jan., 2004 Sunday Time: 10 a.m.- 1 Noon Total marks: 100

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

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

1. What is UPDATE DYNAMICS?
2. What is Diatomic Encoding? Give an example.
3. Define SYNCHRONOUS Transmission Mode.
4. What is the frequency range for
   a) Human Hearing Frequency Range
   b) Ultrasound
5. Find the AUDIO DATA RATE in KB/sec. for CD-DA for the following input data:
   - SAMPLE FREQUENCY = 44.1 KHZ
   - 16 BIT Linear Quantization
   - 2 channels
   - 44100 samples / second for each channel.
6. What is a HYPERMEDIA System ?
7. What is MONOPHONY?
8. In a multimedia operating system, give an example each for an ACTIVE RESOURCE and a PASSIVE RESOURCE.
9. What is *Intra-Object* Synchronization? Give an example.
10. What is TYPE 3 Relational Model ?

Part B. **Compulsory Question** 15 Marks

1. Explain the basic principles of FOUR LAYER SYNCHRONIZATION REFERENCE MODEL.

Part C. Answer any **FIVE** Questions. 5 * 13 = 65 Marks

1. Explain the following w.r.t. multimedia applications:
   a) Elements of a VIDEO-ON-DEMAND System.
   b) Features of a GRAPHICS EDITOR. [7+6 marks]

2. Explain the following characteristics of a Multimedia DBMS:
   a) Corresponding Storage Media.
   b) Descriptive Search Methods
   c) Long Transactions
   d) View-Specific and Simultaneous Data Access
   e) Device-Independent Interface
   f) Format-Independent Interface. (5*2 + 3 marks)

COURSE File

3. Explain the following:
   a) Components of a Speech Transmission System (Source Coding in parameterized systems)
   b) GRANULARITY of a MOTION PICTURE SEQUENCE. (assume uncompressed video sequence). [6+7 marks]

4. Explain the following steps w.r.t. IMAGE RECOGNITION:
   a) Image Formatting
   b) Conditioning
   c) Labelling
   d) Grouping
   e) Extracting
   f) Matching [2+2+3+2+2+2 marks]

5.
   a) ***Draw*** the *Time Diagram* of an *Interactive Multimedia Presentation* for a practical application of your interest and **briefly describe** it.
   b) ***Draw*** the CLASS HIERARCHY of MHEG objects in the form of a Tree. [7+6 marks]

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

Letter	I	M	Y	U	C	N	O	J	A	B
Rel. Frequency	24	7	3	32	38	44	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 "COIN" using the above scheme. [8+3+2 marks]

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IV Year First Semester 2003-2004

Degree: B.S. Branch: C.S.E.

TEST I Question Paper

Course No : EA UC473 Course Title: Multimedia Computing

Date: 12, Oct., 2003 Sunday Time: 10 a.m.- 10.55 a.m. Total marks: 20

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

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1. Define ISOCHRONOUS Transmission Mode. [2]

2. What is the Storage Capacity per image for SVGA Video Controller ? [2]

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

4. Define HYPERMEDIA. [1]

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

6. Explain the following w.r.t. Data Stream Characteristics for Continuous Media:
   a) Strongly Periodic Stream b) Weakly Periodic Stream c) Apeiodic Stream. [6]

7. Explain CHANNEL MESSAGES and SYSTEM MESSAGES in a MIDI System. [5]

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IV Year First Semester 2003-2004

Degree: B.S. Branch: C.S.E.

Makeup TEST I Question Paper

Course No : EA UC473 Course Title: Multimedia Computing

Date: 30/10/03 Time: 12-12.50 Total marks: 20

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

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1. Explain YIQ Encoding Operations of an NTSC System. [5]

2. Describe the functions of a Speech Recognition System. [4]

3. Explain the VARIATION of CONSECUTIVE PACKET AMOUNT in Data Streams. [6]

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

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

IV Year First Semester 2003-2004

Degree: B.S. Branch: C.S.E.

TEST II Question Paper

Course No : EA UC473 Course Title: Multimedia Computing

Date: 16, Nov., 2003 Sunday Time: 10 a.m.- 10.50 a.m. Total marks: 20

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

1. For HDTV Motion Video, the following data are given:

QUANTIZATION = 24 bits / pixel
Total Pixels per frame = 870, 000
Data Rate = 1036.8 Mbytes / sec. What is the FRAME RATE? [2]

2. What is INBETWEEN PROCESS? Where is it used? [2]

3. What is MOTION DYNAMICS? Give an example. [2]

4. Mention the names of any 4 Animation Languages. [2]

5. Explain MCU [minimum coded units] in JPEG image preparation With an illustration. [4]

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

Letter	E	L	Y	U	C	N	R	I
Rel. Frequency	24	7	3	32	38	44	44	120

Construct the HUFFMAN Coding Tree step by step for the above letters. [5]

7. Find SSD [sum of squared differences] correlation and SAD [sum of absolute differences] correlation for the following data:

MATCH WINDOW [macroblock]	SEARCH WINDOW
7 9 8	6 10 9
5 4 6	4 5 7
9 8 2	10 7 1

[3]

Course file

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BITS PILANI Dubai Campus 02/10/03

Course : EA UC473 Multimedia Computing

Assignment 1: Multimedia Consultant's Report

Due to your extensive knowledge of multimedia you have accepted a position with a small but ambitious software development company that is looking to take advantage of multimedia technology in its activities. Unfortunately (but challengingly for you) the organisation currently has little or no expertise in - or indeed understanding of - the requirements of multimedia development. They are looking to you to develop their capacity in this area. They have seen the hype, and want to know what it can do for them.

To this end, you have been directed to produce a report for the company's executives on the current status of multimedia technology, focussing in particular on the "state-of-the-art" in multimedia hardware. You are also expected to describe the role that such hardware (and its associated software tools) would play in the company's operations. It will also be important that you give some consideration to the implications for personnel, training and facilities.

In the first instance you are required to produce a clear, structured analysis that is presented as a written report. Remember that this report is aimed at people with limited technical knowledge of multimedia (but who are by no means ignorant of 'traditional' computer technology, and will not appreciate being 'talked down to'), so it has to be both detailed and intelligible. As these are busy people with other issues to consider, your report will not be well-received if it exceeds 4-5 pages in length.

Presentation

Your report should be word processed and laser printed on A4 paper, and submitted in a suitable folder. Most analytical reports have a standard type of structure with three major sections:

Front Matter	Cover Letter/memorandum of transmittal Title Contents page List of illustrations Summary/synopsis/abstract
Report Body	Introduction Discussion Conclusion Recommendations
End Matter	References Appendices

Submission Date: 30/10/2003. Weightage: 5%

Assignment 2

In this assignment you are to prepare a **7 minute multimedia presentation** to support your former report to the software development company's executives on the current status of multimedia technology, focussing on the "state-of-the-art" in multimedia hardware, the role that such hardware and its associated software tools would play in the company's operations and the implications for personnel, training and facilities.

It is expected that the presentation will be developed in ***PowerPoint***, but those familiar with ***Authorware*** or ***Director*** may choose to develop their presentation in either of these authoring tools.

The presentation should include the use of full screen colour slides and the incorporation of either illustrations, graphs, tables, scanned images and/or clip art.

It is desirable to include animation, sound imports and/or digital video imports.

A script of the narration to accompany your presentation **should** be included. This may be incorporated into the presentation or included in the PowerPoint 'Note Pages'. Remember the multimedia presentation should be used to reinforce the key recommendations made in your report.

Presentation: In the Computer Laboratory.

Submission : A hard copy of presentation slides

Presentation / Submission Date: 03/11/2003. Weightage: 5%

Course Faculty : Dr. B. Vijayakumar

BITS, Pilani – Dubai Campus, Knowledge Village, Dubai.
IV Year First Semester 2003-2004
Degree: B.S. Branch: C.S.E.
QUIZ
Course No : EA UC473 Course Title: Multimedia Computing
Date: 18, Dec., 2003 Thursday Time: 2.- 2.30 p.m. Total marks: 10
Weightage: 10% Venue : Room 202 ***Closed Book***.

IDNO: **Name:**

Write answers in the space provided in question paper. Answer all 20 questions.
Note: _____ means one or more words to be filled within a line.

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1. MHEG stands for _____

2. CD-DA stands for _____

3. _____ communicate with users using Multiple Media.

4. In MHEG Class Hierarchy, _____ is modeled through the *selection* and *modification* class.

5. In CDROM *Mode 1* Block, the number of bytes for SYNC [synchronization] is _____

6. AIMI stands for _____.

7. A multimedia document comprises of information coded in at least one _____.

8. VLP stands for _____.

9. _____ refer to numerous attributes of collections of heterogeneous objects.

10. The main issue during the presentation of continuous media streams is the continuity in _____.

11. SGML stands for _____

12. In Optical Storage Media, the laser beam is focused on the _____ from the substrate layer.

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13. _____ allows listeners with bilateral hearing capabilities to hear lower intensity sounds.

14. In Optical Storage Media, the reflected laser beam has a strong intensity at the _____.

15. If a CD is played at a CLV, then _____ Varies.

16. WORM stands for _____.

17. A _____ is mainly determined through non-linear links of information.

18. If a CD is played at a CAV, then _____ is Constant.

19. Some properties of the particular MHEG engine can be queried by the _____.

20. A CDROM BLOCK in MODE 2, FORM 1 (in CDROM-XA) has _____ bytes for USER DATA.