

Multimedia Systems – May 2005

Time : 3 Hrs.]

[Marks : 100

N.B. : (1) Question No. 1 is **compulsory**.

(2) Attempt any **four** questions out of the remaining **six** questions.

1. A leading travel agency has decided to develop application package to help its customers in planning tours. The agency provides services like air, railway, luxury coach, hotel booking etc. Many a times customers do not have idea of availability of transport services to a particular destination. The agency also gives advice regarding economical planning of vacation / tour. Given the tour constraints like number of days, affordable cost and places to visit the software should present alternative tour plans. Alternatively the software may be just used for querying to know availability of transport services, hotels etc. Besides these main objectives the software should also have facilities for billing and accounting for the agency. You are appointed as a consultant to develop implementation strategy for the automated tourist system. Answer the following questions : [20]
 - (a) Give the Multimedia database schema design.
 - (b) Design the Multimedia Authoring system
2. (a) Describe the algorithms for the CCITT group 3 standard. How does CCITT group 4 differ from CCITT group 3 . [10]
(b) Describe the Algorithm for the MPEG. Clearly state and explain the mathematical treatment and building blocks used in detail. [10]
3. (a) Explain Resource Interchange File Format with reference to various kinds of chunks and give the pseudocode for the file extensions namely. WAV, AVI for RIFF. [10]
(b) Explain MIDI file format with reference to its chunks and communication Protocol. [10]
4. The commonplace book is a collection of reference materials that 'ABC Detective Agency' constructed to supplement their prodigious memory for facts. The client for the commonplace book is the consulting private detective at the 'ABC Detective Agency'. The clients would like to have the existing paper system accessible through computer searching within a year. The old system must continue to exist until the new system is up and running with equivalent information. The content of the system ranges from critical information about criminals and criminal events to "nice to have" information about vampires and vipers. Critical information includes biographical data about criminals and relevant people and organizations, case histories from 'ABC Detective Agency' and police files, and agony column entries (though this is fine old paper-based institution for advertising for assistance is now being superseded by Web/Internet chat rooms).Biographical information needs to be present in the first release for all criminals known to the agency. You are appointed as a consultant to implement this application. [20]
 - (a) Design the performance requirements if this application is to be used in distributed environment
 - (b) Give the Workflow design.
 - (c) Model the various objects and design special multimedia User interface.
5. (a) Consider an RTP session consisting of four users, all of which are sending and receiving RTP packets into the same multicast address. Each user sends the video at 100kbps. [10]
 - (i) RTCP will limit its traffic to what rate ?
 - (ii) A particular receiver will be allocate how much RTCP bandwidth?
 - (iii) A particular sender will be allocated how much RTCP bandwidth. ?
(b) What are the differences in the hardware for video animation and full motion video ?
What are the similarities? [10]
6. (a) You are appointed as a consultant to set a multimedia laboratory of Intelligent Software Consultancy Private Limited. Give the specifications of the various components of multimedia system to set this laboratory. [10]
(b) In multimedia Networking, Explain audio/video streaming with reference to communication between client and server and the role of RTP, RTSP & RSVP. [10]
7. Write detailed note on (Any Two) [20]
 - (a) Video databases: indexing and retrieval
 - (b) Hypermedia Messaging
 - (c) Architectural and telecommunications considerations.

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N.B. : (1) Questions No. 1 is **compulsory**.

(2) Attempt any **four** of the remaining **six** questions.

1. "Dictionary of the living World" is an ideal type of Multimedia presentation using at the maximum text, sound, images and video. You are appointed as a consultant to implement this application in distributed environment. Assume required data if any and specify clearly. [20]
 - (a) How can you manage multimedia object servers ?
 - (b) Give the design for managing distributed objects.
2. (a) Describe the algorithm for CCITT group 4 2D compression. [10]
(b) Describe the algorithm for the MPEG. Clearly state and explain the mathematical treatment and building blocks used in detail. [10]

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- 3. (a) Explain JPEG DIB file format for still and motion images. [10]
(b) Explain MIDI file format with reference to its chunks and communication protocol. [10]
- 4. **Product Advertisement using Multimedia :** The most impressive advertisement of products use mostly animation, sound and video combined together. A well designed multimedia presentation based basically on animation, video and sound attracts client’s attention and through the use of sound data can pass easily a message to the user. Almost all of this kind of presentations follows a slide–show. The user basically watches the application that is being presented in a predetermined way. You are appointed as a consultant to automate the computerized system to sell the various electronics goods and softwares of multimedia such as maya, photoshop etc. Assume required data and specify clearly. [20]
Answer the following questions :
- (a) Give the Multimedia database schema design.
(b) Design the Multimedia Authoring System.
- 5. **Continuous education program :** One of the most important application using both technologies, networks and multimedia, is distance learning. Computers offer the chance for new educational procedures, which in combination to networks reach levels beyond imagination. Anyone could be educated by the greatest teachers of the world. Computers cannot replace the teacher, but they can bring him closer to the student. Assume required data if any and specify clearly. You are appointed as a consultant to implement this application. [20]
(a) Design the performance requirements if this application is to be used in distributed environment.
(b) Give the workflow design.
(c) Model the various objects and design special multimedia user interface.
- 6. (a) Consider an RTP session consisting of four users, all of which the sending and receiving RTP packets into the same multicast address. Each user sends the video at 100 kbps. [10]
(i) RTCP will limit its traffic to what rate ?
(ii) A particular receiver will be allocate how much RTCP bandwidth ?
(iii) A particular sender will be allocated how much RTCP bandwidth ?
(b) Explain hypermedia messaging with suitable example. [10]
- 7. Write detailed note on (Any two) [20]
(a) Video images, animation and full motion video (b) image Scanners
(c) Storage and Retrieval Technology.

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[Marks : 100

N.B. : (1) Solve any **five** from **seven** questions.
(2) Assume **suitable** data if **necessary**.

- 1. (a) Describe the algorithm for CCITT group 3 standard. How does CCITT group 4 differ from CCITT group 3 ? [10]
(b) Compare and contrast TIFF file format RIFF file format. [5]
(c) Describe the operation of scanner. [5]
- 2. (a) Explain in details WORM read/write operations. [10]
(b) Explain the use of memory cache. How do you determine the required size of memory cache for the system. [10]
- 3. (a) You want state transport automation. Design the database schema for chat organization [10]
(b) Explain different scheduling and policing mechanism in multimedia networking. [10]
- 4. (a) What is workflow in multimedia system ? Explain the workflow using diagram of document imaging ? [10]
(b) What is authering system ? Explain different types of authering system ? [10]
- 5. Write short notes on : [20]
(a) RSVP and RTP
(b) Hypermedia Messaging
(c) Distributed Multimedia Database
(d) Aural Metaphor.
- 6. (a) Explain in details MIDI communication protocols ? [10]
(b) Explain the different design issues we have to consider while designing Virtual Reality Application. [10]
- 7. (a) Explain the different hardware and software requirement for multimedia system. [10]
(b) Explain the architecture of DSP. [10]

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[Marks : 100

- N.B. :** (1) Solve any five questions.
 (2) Figure to the right indicate full marks.
 (3) Assume suitable data wherever required.
1. (a) Draw architecture for network based multimedia services and explain call services, access services, transport services and media services related to such architecture. [10]
 (b) Explain RIFF DIBS file format and compare it with RIFF AVI file format. [10]
 2. (a) Describe factors that affect the performance of multimedia applications. [10]
 (b) Explain the following w.r.t. multimedia systems.
 Triads, horizontal refresh rate, convergence, roping and resolution. [10]
 3. (a) Draw neat labeled diagram for a typical flatbed scanner and explain scanning mechanism and reasons for use of CCD by these scanners. [10]
 (b) What do you mean by video image processing? Explain any five image operations involved in the processing. [10]
 4. (a) (i) Explain how latency and data management is important for managing storage devices. [5]
 (ii) What is seek latency? Explain overlapped seek, mid-transfer seek and elevator seek in brief. [10]
 (b) Compare level 0 through level 5 RAID levels. [5]
 5. (a) You are appointed as a consultant to set up a multimedia laboratory in Government Engineering institute. Give specifications of components, configuration, connectivity, software etc. along with the assumptions. What applications can be developed or run in the laboratory so developed. [10]
 (b) What is multimedia? What is need of multimedia system? Explain workflow in a typical multimedia system with suitable diagram. [10]
 6. (a) Describe with suitable diagram the essential design steps for multimedia system design. (Assume that you are following system design methodology). [10]
 (b) List at least two multimedia software tools for the following. Digital audio, graphic and image editing, video editing, animation, multimedia Authoring. [10]
 7. Write short notes on (any 2) : [20]
 (1) Multimedia video conferencing.
 (2) Multimedia presentation and authoring.
 (3) Digital video and image compression
 (4) Applications of multimedia system.



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Time: 3Hrs.]

[Marks : 100

- N.B.:** (1) Solve any **five** questions.
 (2) Assume suitable data if **required**.
1. (a) Explain RIFF WAVE and BMP file formats in detail. [10]
 (b) Explain human factors and design considerations with respect to virtual reality. [10]
 2. (a) Explain-different multimedia application classes and suggest an-application with shared workpaces and execution environment. [10]
 (b) Explain MPEG compression in detail. [10]
 3. (a) State multimedia system design considerations for specific project. [10]
 (b) Explain different types of multimedia authoring system. [10]
 4. (a) Explain IP multicast, RTP, RTCP, RSVP and RTSP. [10]
 (b) Explain characteristics of Voice Recognition and suggest application using VR. [10]
 5. (a) Explain working of Image scanner and Image enhancement techniques used in it. [10]
 (b) Design web pages using multimedia objects for e-learning web-site maintained by educational institute. [10]
 6. (a) Draw workflow for typical imaging application used in museum. [10]
 (b) Suggest typical multimedia laboratory setup by listing devices with specification and utility of each. [10]
 7. Write short note on (any two) : [20]
 (a) Multimedia architectural and Telecommunicational Considerations.
 (b) Sound Board and Video Grabber Card Architecture.
 (c) Multimedia data bases.



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[Marks : 100

- N.B.:** (1) Attempt any **five** questions.
(2) Assume **suitable** data if **required**.

1. (a) Explain different multimedia elements which can be used in college website. [10]
(b) Compare Lossy and Lossless compression. [10]
2. (a) Explain different multimedia application classes and suggest application of multimedia repositories. [10]
(b) What are different Data and File formats for multimedia systems ? [10]
3. (a) Explain Dedicated and Time line-Based Authoring System. [10]
(b) Explain RTP, RTCP, RSVP, RTSP and IP multicast. [10]
4. (a) Explain shared workspace and execution environment. How it can be used for e-learning ? [10]
(b) What are different types of workflows suggest application of Mail enabled work ? [10]
5. (a) Explain JPEG compression in detail. [10]
(b) Explain Video Display Technology standards. [10]
6. (a) Explain Level 0 through Level 05 of RAID functionality. [10]
(b) Explain Virtual Reality Design considerations. [10]
7. Write short notes on (any two) : [20]
(a) Multimedia Databases
(b) Video conferencing : Design Issues
(c) Multimedia Applications

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Multimedia Systems – May 2008

Time: 3Hrs.]

[Marks : 100

- N.B.:** (1) Attempt any **five** questions.
(2) Assume **suitable** data if **required**.

1. (a) Explain any two authoring systems. Assume that you have been appointed as consultant, suggest Hardware and Software setup to establish Audio-Video editing studio. [10]
(b) Write pseudo code for RIFF waveform audio file format with INFO list chunk. Explain five tags used in the format. [10]
2. (a) Explain lossy and loss-less compression techniques. [10]
(b) Explain shared work space and execution environment. How it can be applicable for car insurance claim settlement ? [10]
3. (a) Explain JPEG compression scheme. [10]
(b) Suggest different multimedia elements which can be used to develop Vehicle Tracking System for Police dept. Justify you suggestions. [10]
4. (a) How does an electronic pen work ? [10]
(b) Explain characteristics of voice recognition. Suggest multimedia application in which voice input plays important role. [10]
5. (a) In a sport club membership card is awarded after scrutinizing personal details including image, thumb impression and voice recording. Suggest suitable work-flow for enrolling and getting membership card with image and thumb impression. Justify you suggestion explaining limitations of other-work flows. [10]
(b) Explain RTP, RTCP, RSVP, RTSP and IP-multicast. [10]
6. (a) Explain human factors and design considerations related to virtual reality. [10]
(b) Explain Level 0 through level 5 of RAID functionality. [10]
7. Write short notes on : (any two) [10]
(a) Multimedia Databases.
(b) Distributed multimedia system.
(c) Multimedia system design methodology.

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Multimedia Systems – November 2008

Time: 3Hrs.]

[Marks : 100

- N.B.:** (1) Attempt any **five** questions.
(2) Assume **suitable data** if **required**.
1. (a) Explain different multimedia application classes and suggest an application with shared workspaces and execution environment. [10]
(b) Explain MPEG compression in detail. [10]
 2. (a) Explain lossy and lossless compression techniques. [10]
(b) Explain human factors and design consideration related to virtual reality. [10]
 3. (a) Explain dedicated and time based authoring system. [10]
(b) Explain RIFF DIBS file format and compare it with RIFF A VI file format. [10]
 4. (a) Describe the algorithm for CCITT group 3 standard. How does CCITT group 4 differ from CCITT group 3 ? [10]
(b) Explain the architecture of DSP. [10]
 5. (a) Explain in detail WORM read/write operations. [10]
(b) What is workflow in multimedia system? Explain the workflow using diagram of document imaging. [10]
 6. (a) Explain different scheduling and policing mechanism in multimedia networking. [10]
(b) Explain aural metaphor. [5]
(c) Compare level 0 through level 5 RAID levels. [5]
 7. Write short notes :
(a) Hypermedia messaging [5]
(b) Distributed multimedia databases [5]
(c) Multimedia application : its design issues. [5]
(d) Multimedia architecture and telecommunication consideration. [5]

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