UNIT-IV

Multimedia -

① Characteristics of multimedia presentation -
→ Multiple Media
→ Non-linearity
→ Scope of interactivity
→ Integrity
→ Digital Representation

② Uses of Multimedia -
→ Distance learning
→ Information distribution
→ Entertainment
→ Home shopping
→ Medical healthcare
→ Video Conferencing
→ Multimedia classroom

Components of Multimedia -
→ Text
→ Audio
→ Video
→ Graphics
→ Animation

③ Types of Mutlimedia -
(1) Text
(2) Hypertext → links embedded in the text
(3) Hypermedia → Hypertext with multimedia
(4) Images
(5) Video
(6) Sound.

Text -

① Text can be of various types -
Plain text - fixed sized characters having same type of appearance, ASCII table
Formatted text - Appearance can be changed using font parameters
Hypertext - links embedded in the text.

② UNICODE standard –

It replaced ASCII table and it is capable of representing international characters from various languages throughout the world.

③ Text Compression –

Huffman Coding –

An optimum set of variable-length code words is derived such that the shortest code word is used to represent the most frequently occuring characters.

Lempel-Ziv (LZ) Coding –

Instead of using a single character as a basis of coding operation, a string of characters is used.

Lempel-Ziv-Welch (LZW) Coding –

Allows the dictionary to be built up dynamically by the encoder and decoder for the document under processing.

④ Text file formats –

TXT – Unformatted (Plain) Text document created by an editor like Notepad on various platform.

DOC – Document, developed by Microsoft, rich set of formatting capabilities

RTF (Rich Text Format) – developed by Microsoft in 1987 for cross platform document exchanges. Default format for Mac OS, similar to HTML.

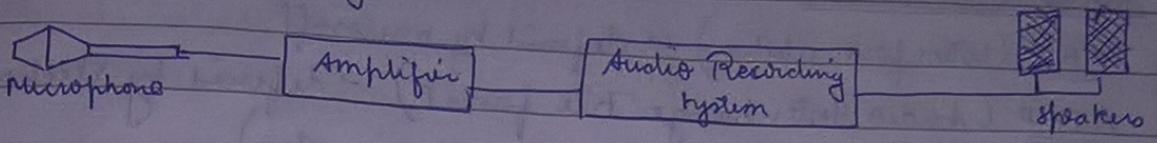
PDF (Portable Document format) – developed by Adobe Systems for cross platform document exchanges. Also supports images and graphics.

PDF is open standard.

PS (Post Script) – Page description language used mainly for desktop publishing. It is a high level language that can describe the contents of a page such that it can be accurately displayed on output devices usually a printer.

Audio -

① Components of audio system -



Microphone → Dynamic, Condenser, Omni-directional, Bi-directional, Uni-directional, polar plot.

Amplifier → Class-A, Class B, Class-AB, Class C, Negative feedback, Class D, Class E.

Speakers → Dynamic, Woofers and Tweeters

Audio Recording System → Audio Mixer

② Digital Audio - Conversion process of sampling, quantization and code word generation.

Sampling frequencies → 40 KHz around.

Steaming Audio → Used for downloading files on the internet.

③ Musical Instrument Digital Interface (MIDI) -

It is a protocol or set of rules for connecting digital synthesizers to each other or to digital computers.

④ Sound Card - It interfaces with the CPU via slots on the mother-board.

Basic components -

→ Memory Banks
→ DSP (Digital signal processor)
→ DAC/ADC (Digital to Analog or Analog to Digital converters)
→ Wave Table/FM synthesizer chip (MIDI synthesizer chip)
→ CD Interface
→ 16 bit ISA Connector
I/O ports → MIC, Line In, Line Out, Speakers.

⑤ Audio File Formats -

WAV (waveform audio) → defined by microsoft
AIFF (Audio Interchange File format) → defined by Electronic Arts
AU (Audio) → developed by Sun Microsystem
MP3 (MPEG layer III) → highly compressed audio format
VOC (Voice) → Used with Sound Blaster sound cards
RMF (Rich Music Format) → Beatnik Inc.
WMA (Windows Media Audio) → Microsoft
RA (Real Audio) → Real Networks
AAC (Advanced Audio Coding) → lossy data compression scheme

⑥ Audio Processing software -

An audio editing software allows you to open, edit, manipulate, transform, and save digital audio sound files in various formats.
Eg - Sound Forge XP and CoolEdit.
→ ~~Digital audio processing~~

Video -

→ Digital Video
→ Digital video processing
→ Video file formats (AVI, MOV, MPEG, DivX, WMV, MP4)
Quicktime movie, motion picture expert group

Digital Audio Processing -