UNIT I

Animation -

1. Major changes take place within the sequence called key frames while the assistants draw a number of frames in between key frames, a process called tweenering.

2. Use of Animation -
   Entertainment industry, computer games, education, industrial and scientific application.

3. Principles of animation -
   (1) Squash and Stretch
   (2) Anticipation
   (3) Staging
   (4) Flow-through and Overlapping Action
   (5) Slow-in and Slow-out
   (6) Arcs
   (7) Secondary Action
   (8) Timing
   (9) exaggeration
   (10) Appeal

4. Computer Based Animation - Based on keyframe concept, timeline, automatically create animation

5. Animation Software -
   - Microsoft PowerPoint & 3DIF Animator - Elementary animation
   - More sophisticated 2D animations - Autodesk Animator Studio, Macromedia Director and Macromedia Flash
   - For 3D animation - 3D Studio MAX and Maya

6. Creation of Objects
   - How they should animate

3D Animation, Animation file formats
Compression:

- lossy / lossless Compression techniques

- Image, Audio & Video Compression

  - MPEG Standards - high quality audio & video compression

  - Multimedia Architecture

  - Multimedia Database

  - Joint MPEG Standards (Motion Picture Expert Group)
    - MPEG-1 - Coded bit rate $\rightarrow 1.5$ Mb/s
    - MPEG-2 - Coded bit rate $\rightarrow 10$ Mb/s
    - MPEG-4 - Very low bit rate system, low quality video over internet connection
    - MPEG-7 - Advanced

- Multimedia Database
  - Allows searching of pictures using characteristics such as colour, texture
  - Allows searching for audio using custom programs

- Lossless Compression
  - Planar RLE, TIFF & GIF
  - Compressed upto 40-60% of original size
  - Method: Entropy, Huffman Coding and Arithmetic methods, LZ, Run-length encoding & Statistical encoding

- Lossy Compression
  - mp3, giz and jpeg
  - Compressed upto 50% of original size
  - Method: Perceptual coding, JPEG, MPEG, MP3

- JPEG Standard (Joint Photographic Experts Group)
  - Image compression algorithm

- DCT - Discrete Cosine Transform
  - Frequency domain
  - Linear transformation
Animation File Formats -
Director (.dir, .der), Animation Pro (.fli, .flic), 3D Studio Max (.max), ImageReady and Director (.pic), Compuserve (.gif), Flash (.fla, .swf)

Multimedia Architecture -

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| Application       | Multimedia Extensions |
|-------------------+-------------------|
| UUI               | Multimedia        |
| OS                | Extensions        |
| Software          | Hardware          |
| Windows           | (multimedia)      |
| OS/2              | (multimedia)      |
| Macintosh         | (multimedia)      |
| Unix              | (multimedia)      |
| Linux             | (multimedia)      |
| Multiflash        | (multimedia)      |
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Multimedia Authoring Tools -
- Faced or frame based tool
- Scene based, event driven tool
- Time based and presentation tool