

Q. Difference between connectors like USB 2.0, USB 3.0, thunderbolt and Fire wire800?

OR

Q-What is Universal serial bus (USB) and explain different types of USB

Answer-

1. FireWire is also known by the term IEEE 1394 High Performance Serial Bus, and Power management – U0 to U3 link power management states are defined

2. USB stands for Universal Serial Bus.

3. The main difference between USB and FireWire is made to handle more data than USB, particularly audio and visual information

4. USB 2.0 can handle a data transfer rate of 480 Mbps,

5. USB 3.0 adds a new transfer type called SuperSpeed or SS, 4.8 Gbit/s

6. Firewire 800 can take on 800 Mbps.

7. USB 3.0 has increased maximum bus power, improved power management

8. Increased bandwidth – USB 3.0 uses two unidirectional data paths instead of only one: One to receive data and the other to transmit.

9. USB 2.0 has 5 Pin

10. USB 3.0 has 9 Pin

11. FIREWIRE800 has 9 Pin

12 Thunderbolt has 20 Pin and PCI Express (PCIe) and Display port (DP) into two serial signals, and additionally provides DC power, all in one cable

13. Implementation of the Usb 3.0 in old computer system is through USB 3.0 adapters Peripheral component interconnect express card, known as PCIe card.

14. Peripheral component interconnect express card, known as PCIe card, is a computer expansion card and is used in motherboard level connection.

15. Earlier USB concepts such as endpoints and the four transfer types (are different. Bulk, control, isochronous and interrupt) are preserved but the protocol and electrical interface the specification defines a physically separate channel to carry USB 3.0 traffic.

16. Thunderbolt is the brand name of a hardware interface developed by Intel (in collaboration with Apple) that allows the connection of external peripherals to a computer.

17. Thunderbolt combines PCI Express(PCIe) and Displayport(DP) into two serial signals, and additionally provides DC power, all in one cable.

18. USB C type-**USB-C**, formally known as **USB Type-C**, is a 24-pin connector system, which is distinguished by its two-fold rotationally-symmetrical connector.

19. USB-C cables and connectors connect to both hosts and devices.

20. carry a minimum of 3 A current (at 20 V, 60 W) but can also carry high-power 5 A current (at 20 V, 100w)

Question-Explain the different audio and video connector like TRS, BNC, HDMI, and XLR connectors!

Answer-

1. TRS -TIP, RING and SLEEVE. The ¼ inch connector is commonly called a phono jack because it was used earlier to patch telephone connections together. The ¼ inch connectors may have only a tip and sleeve, or a tip, ring and sleeve. A TRS connection is used to balanced audio lines or depending upon the equipment, for stereo sound.

2.BNC- named after Bayonet-Neill-Concelman) are round plugs with a bayonet-style locking system, used on coaxial cables.BNC plugs have good impedance characteristics and their locking mechanism keep them securely in place once connected. Often used with high-end equipment. BNC connector is used for composite video on commercial video devices.

3. HDMI- stands for High definition multimedia interface. HDMI is interface to transmitting uncompressed Video data and uncompressed or compressed Audio data from an HDMI-compliant source device to computer monitor and TV.HDMI uses a 19-pin connector that is held in place by friction. It is normally found in LCD monitors and expensive computers or laptops.

4. XLR- The XLR connector was invented by James H.Cannon is a electrical connector primarily found on professional audio video, and stage lighting equipment. Circular in design and have between three,four,five,six and seven pins. Also used for lighting control, low-voltage power supplies, and other applications. XLR connectors are available from a number of manufacturers.

5. S-Video (separate Video) connector is commonly used with high end consumer video equipment. This separates black and white and color and brightness information in video. Also called the Y/C pin for this reason. An S-video cable has 'male' pin at one end and a 'female' pin at the other.

6.HD-15 pin is a very common connector used as a video interface for computers and monitors.Also called VGA connector.it has three rows of 5 pins.one pin in the middle row is usually missing.

7.DVI-Dual link connector contains 24 pins arranged in three horizontal rows of eight pin each and a wide,flat pin called a ground bar. They can send over 10 Gbos of digital video information. These are normally used with HDTVs and satellite receivers.

Q.-File format and codec?

Answer.

1. A file format is like a type of container. A video file format is a type of file format for storing digital video and audio data on computer system
2. A video file normally consists of a container containing video data in video coding format alongside audio data in audio coding format.
3. The container can also contain synchronization information, subtitles, and metadata such as title.
4. Codec-A codec consists two parts—the encoder, which is what you use while you're encoding the video from your timeline or file. The second part is the decoder; this part resides on the viewer's computer as an add-in to decode the video inside the container. The codec is what actually encodes and compresses the video when you're rendering it.
5. Playing or encoding a video file will sometimes require the user to install a codec library corresponding to the type of video and audio coding used in the file. So the codec were developed for the purpose to carry the good quality data and also play properly on the editing machine and at the consumer system.

Normally found file format

.Webm

.Flv

.VOB

.AVI

.MTS

.MP4

.mov

.Wmv

1.WebM is an audiovisual media file format. It is primarily intended to offer a royalty free alternative to use in the HTML video and audio. The development of the format is sponsored by Google .VLC have native support for playing Webm files.Use codec VP8,VP9 and AV1

2.FLv- Flash Video is a container file format used to deliver digital video content over the internet using Adobe Flash player. Use codec VP6, Sorenson spark, screen video and H.264.Apple's IOs devices along with almost all other mobile devices, do not support the Flash player plug-in and require other delivery methods. Use of the H.264 and AAC compression formats in the FLV file format has some limitations

3.Vob- *Versioned Object Base*. Uses H.264 /MPEG-2 codec. Files in vob format have .vob filename extension and are typically stored in VIDEO_TS folder at the root of DVD. The vob format is based on the MPEG program stream format.

4.AVI- Audio video interleave is designed by Microsoft .it was designed to reduce the file size, but in doing so, they reduce the quality of the video. Video stored in AVI format retains its original quality; however, since there is no compression, the file size of the AVI video can be extremely large.

5.MP4, also known as MPEG4, is one of the latest in a long line of MPEG video formats developed by the moving picture expert group. Mp4 supports compression, subtitles, multiple data types and streaming. Due to efficient tradeoff between video quality and file size and streaming support, mp4 is commonly used to distribute video via the internet.

6.MTS- MPEG Transport Stream. MTS and M2TS are both file extensions for the high definition digital video camera recorder format, AVCHD (Advanced Video Codec High Definition). AVCHD was jointly established by Sony Corporation and Panasonic Corporation in 2006 for use in their digital tapeless camcorders. CODEC USE- AVCHD (MPEG-4 / H.264). The standard video format used by many Sony and Panasonic HD camcorders. It is also used for storing high definition video on Blu ray disk.

7.mov- Motor-operated valve. A MOV file is a common multimedia container file format developed by Apple and compatible with both Macintosh and Windows platforms. It may contain multiple tracks that store different types of media data and is often used for saving movies and other video files. MOV files commonly use the MPEG-4 codec for compression.

8.wmv- windows media videos-codec- windows media video, windows media video screen. Developed by Microsoft. The original video compression technology known as *WMV*, was originally designed for Internet streaming applications, as a competitor to Realvideo

9. A very common codec is H.264. It's called a block codec because it looks for differences in blocks of video as it encodes and plays back.

10. If you look at a video from one frame to the next, some pixels change and some are exactly the same as in the frame before. Why encode a pixel that's exactly the same as a pixel in the frame before? That's a waste of bytes. So the software essentially ignores the pixels that don't change and changes the ones that do change

Q.-What are the three broadcast systems? Explain each of them in details?

Answer.-Different part of the world has different broadcast standards. By broadcast standards, we mean the protocol followed to broadcast and receive television signals. Television sets require a source of reference signals that tell the TV receiver to be ready to receive the next picture in the stream of images.

The reason to use the mains power supply frequency

1-The first was that with the older types of power supply, one would get rolling hum bars on the TV picture if the main supply and the signal were not at exactly the same frequency.

2-The second was that the TV studios would have had enormous problems with flicker in their cameras when making programmes.

3.This resulted in a division of the world's TV systems in to tow camps-

25 frames per second (50 Hz) and 30 frames per second (60Hz)

4.NTSC-National television systems committee was introduced in the us in the 1940.it mainly uses in US,Canada and Japan and several other countries.

5.It has 525 lines displayed at 30 frames per second.

6.It has lower resolution than PAL or SECAM but a faster frame rate, which reduces the flicker.

7.It is often received in different variations of color within a given broadcast.

8.EACH frame contains 525 lines and can contain 16 million different colors.

9.PAL-Phase alternative line was developed by walter bruch at telefunken,Germany and is used in much of western Europe ,Asia pacific a(India too) and southern Africa.

10.PAL was first introduced in Germany in 1967.

11.It has higher resolution than NTSC with 625 lines but use 25 frames per second.

12.Pal video has slight flicker in comparison to NTSC because of its lower frame rate.

13.SECAM-sequential colour with memory French is so named because it uses memory to store line of colour information in order to eliminate the colour artefacts found on NTSC systems.

14.Video information is transmitted in alternate lines and a video line store is used to combine the signals together.

15.Secam uses the same resolution and frames rate as pal but its processing of the color information makes it incompatible with PAL

16.The primary motivation behind to developed the secam was to protect French TV manufacturer and make it more difficult to view non-French programming.

17.Political factors from the cold war have also been attributed to the adoption of secam in Eastern Europe

Q-What is the various video tape formats are vogue all over the world? Explain each of them with their applications?

Answer.-

1. Ampex introduced the first professional videotape machine in the USA in 1956. called Quad. These machines employed the format of ha helical scan system on a 2 inches width tape.
2. ¾ inches composite U-matic Hi band primarily for broadcasting purpose.
3. Tape generation loss is an important aspect to be considered when dealing with analogue videotape formats.
4. VHS and S-VHS-analogue-Tape width – ½ inch-Mainly for home and consumer use.
5. ¾ inch U-matic, 3/4 inch U-matic SP- analogue-For industrial/broadcast purpose
6. Betacam and Betacam SP- analogue-½ inch for broadcast-Also available in Digibeta
7. Video8(aka 8 mm) and Hi8- analogue-for amateur use
8. Minidv-digital-¼ inch-For both prosumer and amateur use, mostly use for educational institution for training purposes.
9. DVCPRO-digital-¼ inch-broadcast use
10. DVCAM-digital-¼ inch
11. BETAMAX-analogue-½ inch.

Q-Difference between CD,DVD and Blu ray(single layer, Double layer)?

- Answer-. 1. once media is created, it can be distributed on a variety of platforms. The most common method of distributing is Optical disks.
2. Optical disk use laser light or electromagnetic waves to read or write data onto a disk.
 3. The common types of optical disk are CD,DVDs and Blu-ray disks.
 4. The basic difference between the CD,DVD and blu ray is capacity to write the date size.
 5. Compact disk (CD)- 750Mb,
 6. Digital Versatile disk(DVD)-4.5 to 17 gb
 7. DVD-Dual layer 7.95 gb single side
 - 9.8. DVD- dual layer 15 gb double side.
 10. Blu ray- single layer-25GB

11. Blu-ray –double layer-50GB

12. There are different types of cd comes like

13. CD/CD-ROM- Read only memory, non-writable.

14. CD-R- Recordable. Can be written many times in multiple session modes till its capacity is exhausted.

15. CD-RW-Read write, can write, delete and write again

Q- What do you mean by tapeless format? Explain the difference between different types of card format?

Ans. 1. In the field of professional broadcasting, an end-to-end workflow (from ingest to play out) is called **tapeless** when part, or all of it, is made without any use of audio tape or videotape machines; video and audio sources being ingested, recorded, edited and played out entirely on digital video systems.

2. Tapes were expensive and required a recorder/player to record /capture the footage into the non-linear editing set up.

3. In case of CARD, they are cost effective, does not require any recorder/player.

4. CARD are smaller in size which can be kept easily.

5. Card can record the media more than a tape.

6. CARD comes in SOLID-State card or SD cards.

7. CARD need to be protected from excess heat or cold as well as magnetic field and dust.

8. Should avoid carrying them within notebooks etc.

9. Since they are small they are prone to accidents and loss of video data, so transfer your footage on a daily basis.

10. Available card-Compact flash card (CF).SD CARD,MICRO SD CARD,MINI SD CARD.

Q.-What is the fundamental difference between analogue and digital signals?

Answer.-1. Analog and Digital are the different forms of signals. Signals are used to carry information from one device to another.

2. Analog signal is a continuous wave that keeps on changing over a time period. Digital signal is discrete in nature

3. An analog signal is represented by a sine wave.

4. A digital signal is represented by square waves.

5. An analog signal is described by the amplitude, period or frequency, and phase.

6. A digital signal is described by bit rate and bit intervals.

7. Analog signal has no fixed range.
8. Digital signal has a finite range i.e. between 0 and 1.
9. An analog signal is more prone to distortion.
10. A digital signal is less prone to distortion.
11. An analog signal transmits data in the form of a wave.
12. A digital signal carries data in the binary form i.e. 0 and 1.
13. An analog signal is described using amplitude, period or frequency and phase. Amplitude marks the maximum height of the signal.
14. Frequency marks the rate at which signal is changing.
15. Phase marks the position of the wave with respect to time zero.
16. Digital signal carries information or data in the binary form i.e. a digital signal represents information in the form of bits. Digital signal can be further decomposed into simple sine waves that are called harmonics. Each simple wave has different amplitude, frequency and phase. Digital signal is described with bit rate and bit interval.
17. Digital describes any system based on discontinuous data or events. Computers are digital machines because at their most basic level they can distinguish between just two values 0 and 1, or off and on. There is no simple way to represent all the values in between such as 0.5 or 0.75.
18. Human experience the world analogically.

Q.-Which is the best compression codec for MP4 video?

Answer. 1. First of all we need to know that what is codec-A codec consists of two parts—the encoder, which is what you use while you're encoding the video from your timeline or file. The second part is the decoder; this part resides on the viewer's computer as an add-in to decode the video inside the container. The codec is what actually encodes and compresses the video when you're rendering it.

2. So the codecs were developed for the purpose to carry the good quality data and also play properly on the editing machine and at the consumer system.

3. And MP4 is a file container-codec purpose is to compress the file size but retain the quality of the file. There are different types of file containers like mp4, avi, .mov etc

4. Standard video (SD) is generally 720 X 480 pixels—that equals 345,600 total pixels per frame. If you can do native HD video, the dimensions are 1,920 X 1,080, which equals 2,073,600 pixels. That's a lot more pixels per frame to stream.

5. A very common codec is H.264. It's called a block codec because it looks for differences in blocks of video as it encodes and plays back.

6. If you look at a video from one frame to the next, some pixels change and some are exactly the same as in the frame before. Why encode a pixel that's exactly the same as a pixel in the

frame before? That's a waste of bytes. So the software essentially ignores the pixels that don't change and changes the ones that do change

Q. Describe the difference between video file format like mp4, avi and MPEG?

Answer- 1. AVI is designed by Microsoft .it was designed to reduce the file size, but in doing so, they reduce the quality of the video. Video stored in AVI format retains its original quality; however, since there is no compression, the file size of the AVI video can be extremely large.

2. MP4, also known as MPEG4, is one of the latest in a long line of MPEG video formats developed by the moving picture expert group.

3. Mp4 supports compression, subtitles, multiple data types and streaming . due to efficient tradeoff between video quality and file size and streaming support,mp4 is commonly used to distribute video via the internet.

4.MPEG- is an older format that uses mpeg1 or mpeg2 compression .it is commonly used to distribute video on the internet and DVD.it does not support lossless compression.

Q.What is the EDL?

Answer. - 1.An **edit decision list** or **EDL** is used in the post production process of editing.

2.EDL-Edited Decision List-the purpose behind a EDL is to create the recreation of an edited programme from the original sources and the editing decisions in the EDL.It is electronically generated in non-linear editing system.EDL consist of Time code, which refer the starting and end time of the particular shot.

3.After the offline editing, when you export the file to do the VFX in online /VFX machine, instead of exporting all the high resolution footage, we export the EDL and then import the EDL into the online system, in this process we need to copy the limited amount of footage into the VFX machine.

Q.-Difference between linear editing and non-linear editing?

Answer.-1.Linear video editing is a video editing post-production process of selecting, arranging and modifying images and sound in a predetermined, ordered sequence.

2.Linear editing is also called a analog editing because analog requires greater planning, The order of cuts cannot be shifted, if shifted then has to edit again from the beginning.

3. While digital editing or non-linear editing allows manipulation of the order of shots at will and insertion of new material in between shots in the timeline.

4.Linear editing required-Minimum one player, one recorder and two monitor are required, Titling machine and SFX generator are required. All effects are real time and no rendering is required.

5. Non-linear require Firewire cable, RCA, BNC connectors for monitoring output, a high end computer with audio, video and graphics handling abilities are good enough.

6. Linear- has a single video track and two audio tracks. graphics have to be added during editing itself.

7. Non-linear –depending on how sophisticated the machine is, it can offer unlimited video, audio and graphic tracks graphics can be added later.

Q.-Which is the better hard disk between SATA(HDD) and SSD(solid state disk) and why?

Answer-1. SSD-solid state drive- like a memory stick, there are no moving parts to an SSD. Rather, information is stored in microchips. Conversely, a hard disk drive uses a mechanical arm with a read/write head to move around and read information from the right location on a storage platter. SSD uses what is called NAND-based flash memory. This is a non-volatile type of memory.

2. An SSD does not have a mechanical arm to read and write data, it instead relies on an embedded processor (or “brain”) called a controller to perform a bunch of operations related to reading and writing data. The controller is a very important factor in determining the speed of the SSD. Decisions it makes related to how to store, retrieve, cache and clean up data can determine the overall speed of the drive.

3. Hard Disk Drives, or HDD- HDD uses magnetism to store data on a rotating platter. A read/write head floats above the spinning platter reading and writing data. The faster the platter spins, the faster an HDD can perform. Typical laptop drives today spin at either 5400 RPM (Revolutions per Minute) or 7200RPM, though some server-based platters spin at up to 15,000 RPM!

4. The major advantage of an HDD is that it is capable of storing lots of data cheaply.

Q. Is digitization and data transferring same?

Answer-1. Digitalization means the data which is already recorded on the digital tape cannot be directly shown into the computer. So we required a player, in which insert the digital tape and then digitize the data into the computer editing system. Like mini DV tape and digibeta tapes.

2. Transferring the data means the data which is already digital form but need to transfer into the computer editing system so required a CARD READER, in which SD card/memory card can inserted easily and then transfer all the data into the non-linear editing system.

Q-What is the role of RAM and graphic card in non-linear editing system?

OR

Q.What is the role of graphic card in digital editing system?

Answer. – 1.The most important piece of **graphics** hardware is the **graphics card**, which is the piece of equipment that renders out all images and sends them to a **display**. ... A dedicated **graphics card** has its own **RAM** and Processor for generating its images, and does not slow down the **computer**.

2.Random Access Memory stores data for short-term use. RAM works in conjunction with the hard drive, which takes care of long-term storage, to provide quick access to files that the computer is actively reading or writing.

3.Hard drives can store vast numbers of files, but compared to other computer components, drives run very slowly. Accessing hard drive files -- especially when those files are scattered across the drive due to -- requires the drive to move its mechanical read/write head back and forth and to wait for the spinning platters to spin into the correct position. Even though drives spin at thousands of rotations per minute, this process causes a noticeable delay when reading files.

4.To lessen the slowdown, computers store files in RAM after the files are first read from the drive. RAM has no moving parts (and runs at a higher speed than even a) so the files can load very quickly during subsequent uses.

Q.-What is the requirement of the non linear editing system?

Answer- 1.A non-linear editing approach may be used when all assets are available as files on video servers or hard disks, rather than recordings on reels or tapes. While linear editing is tied to the need to sequentially view film or hears tape, non-linear editing enables direct access to any video frame in a digital video clip without having to play or scrub/shuttle through adjacent footage to reach it, as is necessary with video tape linear editing systems.

2.Video and audio data are first captured to hard disk-based systems, or other digital storage devices. The data are then imported into servers .Once imported, the source material can be edited on a computer using application software any of a wide range of Video Editing software

3.It required a computer system which is connected with Monitor, and a Processor with enough RAM and Graphic card and a application which can process the footage easily

