CS8591 -COMPUTER NETWORKS QUESTION BANK
TWO MARK QUESTIONS WITH ANSWERS

UNIT 1

1. What are the three criteria necessary for an effective and efficient network?

The most important criteria are performance, reliability and security. Performance of the network depends on number of users, type of transmission medium, the capabilities of the connected h/w and the efficiency of the s/w. Reliability is measured by frequency of failure, the time it takes a link to recover from the failure and the network's robustness in a catastrophe. Security issues include protecting data from unauthorized access and viruses.

2. Group the OSI layers by function.

The seven layers of the OSI model belonging to three subgroups. Network support layers: Consisting of Physical, data link and network layers and they deal with the physical aspects of moving data from one device to another. User support layers: Consists of Session, presentation and application layers and they allow interoperability among unrelated software systems. The transport layer ensures end-to-end reliable data transmission

3. What are the features provided by layering?

- It decomposes the problem of building a network into more manageable components. Rather than implementing a monolithic piece of software that does everything implement several layers, each of which solves one part of the problem.
- It provides more modular design. To add some new service, it is enough to modify the functionality at one layer, reusing the functions provided at all the other layers.

4. What are the two interfaces provided by protocols?
- Service interface
- Peer interface
- Service interface-defines the operations that local objects can perform on the protocol.
- Peer interface-defines the form and meaning of messages exchanged between
  protocol peers to implement the communication service.

5. What is LAN?

A LAN is a common name used to describe a group of devices that share a geographic location. LAN is limited to single building or campus.

6. What is flow Control?

Flow control refers to a set of procedures used to restrict the amount of data. The sender can send before waiting for acknowledgment.

7. Define Error detection and correction.

Error Detection:

Data can be corrupted during transmission. It is called as an error. For reliable

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communication, the receiver must find out the errors occurred in the data which is called as error detection.

Error Correction:
It is the mechanism to correct the errors and it can be handled in 2 ways.
a) When an error is discovered, the receiver can have the sender retransmit the entire data unit.
b) A receiver can use an error correcting coder, which automatically corrects certain error.

8.   What is the use of two dimensional parity in error detection?
Two-dimensional parity check increases the likelihood of detecting burst errors. It is used to detect errors occurred in more than one bits.

9.   What are the issues in data link layer?
The data link layer has a number of specific functions it can carry out. These functions include,
a)   Providing a well-defined service interface to the network layer.
b)   Dealing with transmission errors.
c)   Regulating the flow of data so that slow receivers are not swamped by fast senders.

10.   What are the ways to address the framing problem?
The framing problem can be addressed by the following protocols:
- Byte-Oriented Protocols(PPP)
- Bit-Oriented Protocols(HDLC)
- Clock-Based Framing(SONET)

11.   What are the responsibilities of data link layer?
Specific responsibilities of data link layer include the following.
a)   Framing
b)   Physical addressing
c)   Flow control
d)   Error control
e)   Access control

12.   Mention the types of errors.
There are 2 types of errors
a)   Single-bit error.
b)   Burst-bit error.

13.   Define the following terms.
Single bit error: The term single bit error means that only one bit of a given data unit (such as byte character/data unit or packet) is changed from 1 to 0 or from 0 to1.
Burst error: Means that 2 or more bits in the data unit have changed from 1 to 0 from 0 to1.

14.   What is redundancy?
It is the error detecting mechanism, which means a shorter group of bits or extra bits may be appended at the destination of each unit.

15.   What is the purpose of hamming code?
A hamming code can be designed to correct burst errors of certain lengths. So the simple

strategy used by the hamming code to correct single bit errors must be redesigned to be applicable for multiple bit correction.

16.   What is mean by error control?

Error control is a method that can be used to recover the corrupted data whenever possible. These are two basic types of error control which are backward error control and forward error control.

17.   What is OSI?

A standard that specifies a conceptual model called Open systems Interconnection network interface model, which breaks networked communications into seven layers: Application, Presentation, Session, Transport, Network, Data link, Physical.

18. State the major functions performed by the presentation layer of the ISO OSI model. (Nov Dec 2006)

Presentation layer is concerned with the format of data exchanged between peers, for example, whether an integer is 16, 32, or 64 bits long and whether the most significant bit is transmitted first or last, or how a video stream is formatted.

19. State the purpose of layering in networks? (May Jun 2007)

A layer is a collection of related functions that provides services to the layer above it and receives services from the layer below it.

To execute the functions by each layer is independent.

20. What are the two fundamental ways by which network performance is measured?
     1. Bandwidth
     2. Latency

UNIT - II

1.   What are the responsibilities of Network Layer?

The Network Layer is responsible for the source-to-destination delivery of packet possibly across multiple networks (links).
  a.   Logical Addressing b. Routing.

2.   What is DHCP?

The Dynamic Host Configuration Protocol has been derived to provide dynamic configuration. DHCP is also needed when a host moves from network to network or is connected and disconnected from a network.

3.   Define ICMP

Internet Control Message Protocol is a collection of error messages that are sent back to the source host whenever a router or host is unable to process an IP datagram successfully.

4. What is the need of internetwork?

To exchange data between networks, they need to be connected to make an Internetwork.

5.   What are the types of class full addressing?

The types are Class A, Class B, Class C, Class D, and Class E

6.   What do you mean by ARP?

ARP stands for Address resolution protocol. ARP is a dynamic mapping method that finds a physical address for a given a logical address. i.e. mapping IP address to physical address.

7.   What do you mean by RARP?

RARP stands for Reverse Address resolution protocol, maps a MAC address to an IP address.

8.   What are the functions of MAC?

MAC sub layer resolves the contention for the shared media. It contains synchronization, flag, flow and error control specifications necessary to move information from one place to another, as well as the physical address of the next station to receive and route a packet.

9.   Define the term medium access control mechanism

The protocol that determines who can transmit on a broadcast channel are called medium access control (MAC) protocol. The MAC protocols are implemented in the Mac sub-layer which is the lower sub-layer of the data link layer.

10.   What is bridge?

Bridge is a hardware networking device used to connect two LANs. A bridge operates at data link layer of the OSI reference model.

11.   What is a repeater?

Repeater is a hardware device used to strengthen signals being transmitted on a network.

12.   Define router

A network layer device that connects networks with different physical media and translates between different network architecture.

13.   What is a switch?

A switch is a networking device that manages networked connections between devices on a star networks.

14.   What is mean by Ethernet?

Ethernet is a networking technology developed in 1970 which is governed by the IEEE 802.3 specifications.

15.   Advantages of Ethernet

1.   Inexpensive   2.Easy to install   3.Supports various writing technologies.

16. Identify the class and default subnet mask of the IP address 217.65.10.7.

IP Address 217.65.10.7 belongs to Class C. Its subnet mask is 255.255.255.0.

17. What are the limitations of bridges?
1. Scale
2. Heterogeneity

18. Define Bluetooth.
Bluetooth is a wireless technology standard for exchanging data over short distances (using short-wavelength UHF radio waves in the ISM band from 2.4 to 2.485 GHz) from fixed and mobile devices and building personal area networks (PANs).

20. What are the 3 levels of hierarchy in IP Addressing?
1. Netid
2. Subnetid
3. Hostid

21. What are the functions of bridge?
1. Connecting networks
2. Filtering information so that network traffic for one portion of the network does not congest the rest of the network.

22. Define sub- netting
Sub-netting is a technique that allows a network administrator to divide one physical network into smaller logical networks and thus control the flow of traffic for security or efficiency reasons.

UNIT - III

1. What is routing?
Routing is a process of selecting paths in a network through which network traffic is sent.

2. Define an internetwork.
A collection of interconnected network is called an internetwork.

3. What does routing metric mean?
A routing metric is a unit calculated by a routing algorithm for selecting or rejecting a routing path for transferring data/traffic.

4. What are the metrics used in determining the best path for a routing protocol?
- Bandwidth
- Delay
- Load
- Reliability
- Cost
- Hop count

- MTU
- Ticks

5.   What is multicasting?

Multicasting is the delivery of information to a group of destinations simultaneously using the most efficient strategy to deliver the messages over each link of the network only once.

6.   What are different types of multicast routing?

1. Reverse path multicasting
2. Reverse path broadcasting

7. What is multicast? What is the motivation for developing multicast?

Multicasting means delivering the same packet simultaneously to a group of clients. Motivation for developing multicast is that there are applications that want to send a packet to more than one destination hosts.

8. Define RIP.

RIP is a dynamic protocol used for finding the best route or path from ene-to-end over a network by using a routing metric/ hop count algorithm.

9. What is OSPF?

OSPF protocol is a router protocol used within larger autonomous system networks in preference to the Routing Information Protocol (RIP).

10. What are the features of OSPF?

- Authentication of routing messages
- Additional hierarchy
- Load balancing

11. Mention any four applications of multicasting

- Broad casts of audio and video
- Video conferencing
- Shared Applications.
- IGMP is used by multicast routers to keep track of membership in a multicast group.

12. Describe the process of routing packets

Routing is the act of moving information across an internetwork from a source to a destination.

13.   What are the some routing algorithm types?

The routing types are static, dynamic, flat, hierarchical, host-intelligent, router- intelligent, intra-domain, inter-domain, link state and distance vector.

14.   What is a benefit of DHCP?

- Simplicity: clients need to manual configuration.
- Mobility and hosts: Hosts may move between networks without reconfiguring.

- Mobility of network: Possible for internet service providers to reconfigure customers address transparently.
- Save address space if individual clients are not always active.

15. What are the 3 types of routing performed by BGP?
- Inter-autonomous system routing
- Intra-autonomous system routing
- Pass through autonomous system routing

16. What are the different kinds of multicast routing?
- DVMRP
- PIM
- MSDP
- MOSPF
- MBGP

17. Write the types of PIM.
- PIM Sparse mode
- PIM Dense mode
- Bidirectional PIM
- Source Specific Multicast (SSM)

18. How can the routing be classified?
The routing can be classified as,
- Adaptive routing
- Non-adaptive routing.

19. What are the salient features of IPv6?
Salient features are:
- Efficient and hierarchical addressing and routing infrastructures.
- IPv6 networks provide auto configuration capabilities.
- Better support for QOS.
- Large Address space.
- Stateless and stateful address configuration.

20. Write the BGP Message types.
- Open
- Update
- Notification
- Keep-alive

UNIT- IV

1.   What are the fields on which the UDP checksum is calculated? Why?

UDP checksum includes a pseudo header, the UDP header and the data coming from the application layer.

2.   What are the advantages of using UDP over TCP?

- UDP does not include the overhead needed to detect reliability
- It does not need to maintain the unexpected deception of data flow
- UDP requires less processing at the transmitting and receiving of hosts.
- It is simple to use for a network
- The OS does not need to maintain UDP connection information.

2.   What is TCP?

TCP provides a connection oriented, reliable byte stream service. The connection oriented means the two applications using TCP must establish a TCP connection with each other before they can exchange data.

3.   Define congestion

When too many packets rushing to a node or a part of network, the network performance degrades. This situation is called as congestion.

4.   List the flag used in TCP header.

TCP header contains six flags. They are URG, ACK, PSH, RST, SYN, FIN

5.   Give the approaches to improve the QoS.

Fine grained approaches, which provide QoS to individual applications or flows. Integrated services, QoS architecture developed in the IETE and often associated with RSVP.

6. What do you mean by QoS?

Quality of Service is used in some organizations to help provide an optimal end user experience for audio and video communications. QoS is most commonly used on networks where bandwidth is limited with a large number of network packets competing for a relatively small amount of available and width.

7.   What is multiplexing?

The job of gathering data chunks at the sources host from different sockets, encapsulating each data chunks with header information to create segments, and passing the segments to the network layer is called multiplexing.

8.   What is de-multiplexing?

The job of delivering the data in a transport layer segment to the correct socket is called de-

multiplexing.

9. What is RTT?

RTT is an acronym for Round Trip Time: it is a measure of the time it takes for a packet to travel from a computer, across a network to another computer, and back.

10. What is the segment?

Transport layer protocols send data as a sequence of packets. In TCP/IP these packets are called segments.

11. What is a port?

Applications running on different hosts communicate with TCP with the help of a concept called as ports. A port is a 16 bit unique number allocated to a particular application.

12. List the services of end to end services.

- Guarantee message delivery.
- Delivery messages in the same order they are sent.
- Deliver at most one copy of each message.
- Support arbitrarily large message.
- Support synchronization.

13. What is congestion?

When load on network is greater than its capacity, there is congestion of data Packets. Congestion occurs because routers and switches have queues or buffers.

14. What are the functions of transport layer?

- Breaks messages into packets.
- Connection control.
- Addressing.
- Provide reliability.

15. What are the types of QoS tools?

Classification Congestion management,

- Congestion avoidance
- Shaping/policing
- Link efficiency

16. List some ways to deal with congestion

- packet elimination
- Flow control
- Buffer allocation

- Choke packets

17.   Define network congestion?

When two or more nodes would simultaneously try to transmit packets to one node there is a high probability that the number of packets would exceed the packet handling capacity of the network and lead to congestion.

18.   List the three types of addresses in TCP/IP.

Three types of addresses are used by systems using the TCP/IP protocol: the physical address, the internetwork address (IP address), and the port address.

19.   What is the flow characteristics related to QoS?

The flow characteristics related to QoS are

- Reliability
- Delay
- Jitter
- Bandwidth

20.   What are the techniques to improve QoS?

The techniques to improve QoS are

- Scheduling
- Traffic shaping
- Resource reservation
- Admission control

21.   Define Socket address.

The combination of IP address and port address is called Socket address.

22.   What are the two types of protocols used in Transport layer?

The two types of protocols used in Transport layer are

- TCP
- UDP

23.   Define Throughput.

It is defines as a number of packets passing through the network in a unit of time.

24.   Define UDP

User datagram protocol is a Unreliable, connectionless protocol, used along with the IP protocol.

25.   What is the need of port numbers?

Port numbers are used as an addressing mechanism in transport layer.

26. **What are the types of port numbers used in transport layer?**
- Well-known port
- Registered port
- Dynamic port

27. **Why TCP services are called Stream delivery services?**

TCP allows the sending process to deliver data as a stream of bytes and the receiving process to deliver data as a stream of bytes. So it is called as stream of bytes.

28. Define jitter

Jitter is defined as a variation in the delay of received packets. The sending side transmits packets in a continuous stream and spaces them evenly apart. Because of network congestion, improper queuing, or configuration errors, the delay between packets can vary instead of remaining constant.

29. **Compare connectionless service & connection oriented service**

In connection less service there is no connection between transmitter & receiver Ex: UDP

In connection oriented service there is a connection between transmitter & receiver Ex: TCP

30. **What is Unicast & Multicast communication?**
- **Unicast communication** is one source sending a packet to one destination.
- **Multicast communication** is one source sending a packet to multiple destinations.

UNIT - V

1. **Define the two types of user agents in the electronic mail system**
- Command driven: It normally accepts a one character command from the keyboard to perform its task.
- GUI based: They contain GUI components that allow the user to interact with the software by using both the keyword and mouse.

2. **What is DNS?**

DNS is a client/server application that identifies each host on the internet with a unique user friendly name.

3. **What is the purpose of inverse domain?**

The inverse domain is used to map an address to a name.

4. **What is SMTP?**

Simple Mail Transfer Protocol is a standard and reliable host to host mail transport protocol that operates over the TCP port 25.

5.   State the Purpose of SNMP

The primary purpose of SNMP is to allow the network administrator to monitor and configure devices on the network, remotely via the network. These configuration and monitoring capabilities are collectively referred to as management.

6.   What is the Domain name system responsible for?

The Domain Name system converts domain names (of the form www.vtubooks.com) into IP numbers.

7.   What are the four main properties of HTTP?
- Global Uniform Resource Identifier
- Request response exchange.
- Statelessness.
- Resource meta data

8.   What is SMTP used for?

SMTP is used when email is delivered from an email client, such as Outlook Express, to an email server or when email is delivered from one email server to another.

9. What is virtual terminal?

A virtual terminal is a data structure maintained by either the application software or a local terminal.

10.   What are the basic functions of email?

Composition, Transfer, Reporting, Displaying and Disposition of mails.

11.   Define WWW?

It is an internet application that allows users to view web pages and move from one web page to another.

12.   What is the web browser?

Web browser is a software program that interprets and displays the contents of HTML web pages.

13.   What is URL?

URL is a string identifier that identifies a page on the World Wide Web.

14.   What do you mean by TELNET?

TELNET is used to connect remote computers and issue commands on those computers.

15. What are the responsibilities of Application Layer?

The Application Layer enables the user, whether human or software, to access the network. It provides user interfaces and support for services such as e-mail, shared database management and other types of distributed information services
- Network virtual Terminal,

- File transfer, access and Management (FTAM),
- Mail services,
- Directory Services

16. **Write down the three types of WWW documents.**

The documents in the WWW can be grouped into three broad categories: static, dynamic and active.

   A) *Static:* Fixed-content documents that are created and stored in a server.
   B) *Dynamic*: Created by web server whenever a browser requests the document.
   C) *Active:* A program to be run at the client side.

17. **What is fully Qualified Domain Name?**

If a label is terminated by a null string is called a Fully Qualified Domain Name.

18. **What is Generic Domains?**

Generic domain defines registered hosts according to their generic behavior. Each node in the tree defines a domain, which is an index to the domain name space database. Eg.-

   com – Commercial organizations,

   edu - Educational institutions,

   gov – Government Institutions.

19. **What is simple mail transfer protocol?**

The TCP/IP protocol that supports electronic mail on the internet is called Simple Mail Transfer Protocol (SMTP). It is a system for sending messages to other computer users based on email addresses.

20. **What do you mean by File transfer protocol?**

It is a standard mechanism provided by the internet for copying a file from one host to another.

21. **What are the two types of connections in FTP?**

The two types of connections in FTP are

- Control connection
- Open connection

22. **Define HTTP.**

It is used mainly to access data on the World Wide Web. The protocol transfers data in the form of plaintext, hypertext, audio, video and soon.

23. **What are the types of messages in HTTP transaction?**

The types of messages in HTTP transaction are

- Request messages
- Response messages

24.   What are the parts of a browser?

The parts of a browser are

- A controller
- A client program
- Interpreter

25.   Name the four aspects of security.

- Privacy
- Authentication
- Integrity
- Non-repudiation

26.   What is POP?

Post Office Protocol, version3 (POP3) and Internet Mail Access Protocol version4 (IMAP4) are protocol used by a mail server in conjunction with SMTP to receive and hold mail for hosts.

27.   What is the function of SMTP?

The TCP/IP protocol supports electronic mail on the Internet is called Simple Mail Transfer (SMTP). It is a system for sending messages to other computer users based on email addresses. SMTP provides mail exchange between users on the same or different computers.

28.   How does MIME enhance SMTP?

MIME is a supplementary protocol that allows non-ASCII data to be sent through SMTP. MIME transforms non-ASCII data at the sender site to NVT ASCII data and deliverers it to the client SMTP to be sent through the Internet. The server SMTP at the receiving side receives the NVT ASCII data and delivers it to MIME to be transforming feed back to the original data.

29.   Why is an application such as POP needed for electronic messaging?

Workstations interact with the SMTP host, which receives the mail on behalf of every host in the organization, to retrieve messages by using a client-server protocol such as Post Office Protocol, version 3(POP3). Although POP3 is used to download messages from the server, the SMTP client still needed on the desktop to forward messages from the workstation user to its SMTP mail server.

IMPORTANT 16 MARKS WITH KEY POINTS
UNIT -I

1. **Explain ISO/OSI reference model.**
   - Physical layer
   - Data link layer
   - Network layer
   - Transport layer
   - Session layer
   - Presentation layer
   - Application layer

2. **Explain the topologies of the network.**
   - Mesh topology
   - Star topology
   - Tree topology
   - Bus topology
   - Ring topology

3. **Explain the categories of networks.**
   - Local Area Network(LAN)
   - Metropolitan Area Network(MAN)
   - Wide Area Network(WAN)

4. **Explain error detection and error correction techniques.**
   Types of errors
   - Single bit error
   - Burst error

   Error detection
   - Vertical redundancy check(VRC)
   - Longitudinal redundancy check(LRC)
   - Cyclic redundancy check(CRC)
   - Checksum

   Error correction
   - Single-bit error correction
   - Hamming code

- Burst error correction

5. Explain error control mechanism.
- Stop and wait ARQ
- Sliding window ARQ
- Go back-n
- Selective-reject

UNIT - II

1. Explain detail about IEEE 802.3 MAC sub-layer
Frame format
Frame length
Ethernet specifications
Manchester encoding
Binary exponential Back off algorithm
Ethernet performance

2. Explain detail about Bluetooth architecture
Radio layer
Baseband layer
Frame format

L2CAP
Hidden Station Problem

3. Explain about IPv4
address Classful
addressing Special IP
addressing Classless
addressing Header
format
IP fragmentation Options
Sub-netting a network

4. Explain about Address resolution protocol Packet format
Encapsulation
Proxy ARP

5. Explain about RARP
Frame Format of RARP
Encapsulation

6. Explain about Internet Control Message Protocol
Message types
Message format
Error Reporting
Echo Request and reply
Time stamp request and reply

Address mask request and reply message.

7. Explain about Ethernet.

Access method : CSMA/CD Addressing

Electrical specification

Frame format Implementation:

10 base 5:Thick Ethernet

10 base 2: Thin Ethernet,

10 base T : Twisted-pair Ethernet

1 base 5 : Star LAN

UNIT – III

1. Explain IP addressing method.

Internetwork protocol (IP) Datagram

Addressing Classes

Dotted decimal notation

2. Define routing & explain distance vector routing and link state routing.

Distance vector routing

Sharing information

Routing table:

Creating the table

Updating the table:

Updating algorithm

Link state routing:

Information sharing

Packet cost

Link state packet:

Getting information about neighbors

Initialization Link state database

3. Define bridge and explain the type of bridges.

Bridges:

Types of bridges

Simple bridge

Multi-port bridge

Transparent bridge

4. Explainsub-netting

Three levels of hierarchy masking

Masks without sub-netting

Masks with sub-netting

Finding the sub-network address

Boundary level masking
Non-boundary level masking

5. **Write short notes about repeaters, routers and gateways.**

Repeaters
Routers: Routing concepts
Least-cost routing
Non adaptive routing
Adaptive routing
Packet lifetime
Gateways

UNIT- IV

1. **Explain the duties of transport layer.**

End to end delivery

Addressing

Reliable delivery

Error control

Sequence control

Loss control

Duplication control

Flow control

Multiplexing

2. **Explain UDP &TCP.**

User Datagram Protocol (UDP)
   Source port address
   Destination port address
   Total length
   Checksum
Transmission Control Protocol (TCP)
   Source port address
   Destination port address
   Sequence number
   Acknowledgement number
   Header length
   Reserved Control
   Window size
   Check sum
   Urgent pointer
   Options and padding

3. **Explain about congestion control.**

Congestion Control
> BECN
> FECN
> Four situations
> Discarding

4. Explain about Congestion Avoidance
> DECbit scheme
> RED

5. Explain detail about QoS Policing
Integrated service
Traffic Shaping
Admission Control
RSVP
Differentiated Services/Qos

UNIT-V

1. Explain the functions of SMTP.
System for sending messages to other computer users based on e-mail addresses.
SMTP provides mail exchange between users on the same or different computers.
User Agent
Mail Transfer Agent
Multipurpose Internet Mail Extensions
Post Office Protocol

2. Write short notes on FTP.
Transfer a file from one system to another.
TCP connections
Basic model of FTP

3. Explain about HTTP.
HTTP transactions
HTTP messages
URL

4. Explain the WWW in detail.
Hypertext & Hypermedia
Browser Architecture
Categories of Web Documents
HTML
CGI Java

5. **Explain about Electronic mail**

Email addressing

Message headers

Formatted email

Functions of email

User agent and message transfer agent

Simple mail Transfer protocol

Multipurpose internet mail extensions

Post Office Protocol (POP)

IMAP

6. **Explain detail about Domain Name System**

Components of DNS

DNS in the internet Name space

Domain name Space Resolution

Message format Resource records

Name servers

Dynamic Domain Same system (DDNS)

MC1704 Computer Graphics and Multimedia System
2 Marks Questions

1. What is scan conversion?

A major task of the display processor is digitizing a picture definition given in an application program into a set of pixel-intensity values for storage in the frame buffer. This digitization process is called scan conversion.

2. Write the properties of video display devices?

Properties of video display devices are persistence, resolution, and aspect ratio.

3. What is rasterization?

The process of determining the appropriate pixels for representing picture or graphics object is known as rasterization.

4. Define Computer graphics.

Computer graphics remains one of the most existing and rapidly growing computer fields. Computer graphics may be defined as a pictorial representation or graphical representation of objects in a computer.

5. Name any four input devices.

Four input devices are keyboard, mouse, image scanners, and trackball.

6. Write the two techniques for producing color displays with a CRT?

Beam penetration method, shadow mask method

7. What is vertical retrace of the electron beam?

In raster scan display, at the end of one frame, the electron beam returns to the left top corner of the screen to start the next frame, is called vertical retrace of the electron beam.

8. Short notes on video controller?

Video controller is used to control the operation of the display device. A fixed area of the system is reserved for the frame buffer, and the video controller is given direct access to the frame buffer memory.

9. What is bitmap?

Some system has only one bit per pixel; the frame buffer is often referred to as bitmap.

10. Differentiate plasma panel display and thin film electro luminescent display?

In plasma panel display, the region between two glass plates is filled with neon gas. In thin film electro luminescent display, the region between two glasses plates are filled with phosphor, such as zinc sulphide doped with manganese.

11. What is resolution?

The maximum number of points that can be displayed without overlap on a CRT is referred to as the resolution.

12. What is horizontal retrace of the electron beam?

In raster scan display, the electron beam return to the left of the screen after refreshing each scan line, is called horizontal retrace of the electron beam.

13. What is filament?

In the CRT, heat is applied to the cathode by directing a current through a coil of wire, is called filament.

14. What is pixmap?

Some system has multiple bits per pixel, the frame buffer is often referred to as pixmap.

15. Write the types of clipping?

Point clipping, line clipping, area clipping, text clipping and curve

clipping.

16. What is meant by scan code?

When a key is pressed on the keyboard, the keyboard controller places a code carry to the key pressed into a part of the memory called as the keyboard buffer. This code is called as the scan code.

17. List out the merits and demerits of Penetration techniques?

The merits and demerits of the Penetration techniques are as follows

• It is an inexpensive technique

• It has only four colors

• The quality of the picture is not good when it is compared to other techniques

• It can display color scans in monitors

• Poor limitation etc.

18. List out the merits and demerits of DVST?

The merits and demerits of direct view storage tubes [DVST] are as follows

• It has a flat screen

• Refreshing of screen is not required

• Selective or part erasing of screen is not possible

• It has poor contrast

Performance is inferior to the refresh CRT.

19. What do you mean by emissive and non-emissive displays?

The emissive display converts electrical energy into light energy. The plasma panels, thin film electro-luminescent displays are the examples.

The Non-emissive are optical effects to convert the sunlight or light from any other source to graphic form. Liquid crystal display is an example.

20. List out the merits and demerits of Plasma panel

display? Merits

• Refreshing is not required

• Produce a very steady image free of Flicker

• Less bulky than a CRT.

Demerits

• Poor resolution of up to 60 d.p.i

• It requires complex addressing and wiring

• It is costlier than CRT.

21. What is persistence?

The time it takes the emitted light from the screen to decay one tenth of its original intensity is called as persistence.

22. What is Aspect ratio?

The ratio of vertical points to the horizontal points necessary to produce length of lines in both directions of the screen is called the Aspect ratio. Usually the aspect ratio is ¾.

23. What is the difference between impact and non-impact printers?

Impact printer press formed character faces against an inked ribbon on to the paper. A line printer and dot-matrix printer are examples.

Non-impact printer and plotters use Laser techniques, inkjet sprays, Xerographic process, electrostatic methods and electro thermal methods to get images onto the papers. Examples are: Inkjet/Laser printers.

24. Define pixel?

Pixel is shortened forms of picture element. Each screen point is referred to as

pixel or pel.

25. What is frame buffer?

Picture definition is stored in a memory area called frame buffer or refresh buffer.

26. Where the video controller is used?

A special purpose processor, which is used to control the operation of the display device, is known as video controller or display controller.

27. What is run length encoding?

Run length encoding is a compression technique used to store the intensity values in the frame buffer, which stores each scan line as a set of integer pairs. One number each pair indicates an intensity value, and second number specifies the number of adjacent pixels on the scan line that are to have that intensity value.

28. What is point in the computer graphics system?

The point is a most basic graphical element & is completely defined by a pair of user coordinates (x, y).

29. Write short notes on lines?

A line is of infinite extent can be defined by an angle of slope q and one point on the line P=P(x,y). This can also be defined as y=mx+C where C is the Yintercept.

30. Define Circle?

Circle is defined by its center xc, yc and its radius in user coordinate units. The equation of the circle is (x-xc) + (y-yc) = r2.

31. What are the various attributes of a line?

The line type, width and color are the attributes of the line. The line type include solid line, dashed lines, and dotted lines.

32. What is antialiasing?

The process of adjusting intensities of the pixels along the line to minimize the effect of aliasing is called antialiasing.

33. What is Transformation?

Transformation is the process of introducing changes in the shape size and orientation of the object using scaling rotation reflection shearing & translation etc.

34. What is translation?

Translation is the process of changing the position of an object in a straight-line path from one coordinate location to another. Every point (x , y) in the object must under go a displacement to (x|,y|). the transformation is:

x| = x + tx ; y| = y+ty

35. What is rotation?

A 2-D rotation is done by repositioning the coordinates along a circular path, in the x-y plane by making an angle with the axes. The transformation is given by: X| = r cos (q + f) and Y| = r sin (q + f).

36. What is scaling?

A 2-D rotation is done by repositioning the coordinates along a circular path, in the x-y plane by making an angle with the axes. The transformation is given by: X| = r cos (q + f) and Y| = r sin (q + f).

37. What is shearing?

The shearing transformation actually slants the object along the X direction or the Y direction as required. ie; this transformation slants the shape of an object along a required plane.

38. What is reflection?

The reflection is actually the transformation that produces a mirror image
of an object. For this use some angles and lines of reflection.

39. What are the two classifications of shear
transformation? X shear, y shear.

40. A point (4,3) is rotated counterclockwise by an angle of 45°. Find the rotation
matrix and the resultant point.

41. Name any three font editing tools.
ResEdit, FONTographer,

42. Differentiate serif and sans serif fonts. Give one example
Serif fonts has a little decoration at the end of the letter, but serif font has
not. Times, new century schoolbook is the examples of serif fonts. Arial, potima
are examples for sans serif fonts.

43. Distinguish between window port & view port?
A portion of a picture that is to be displayed by a window is known as
window port. The display area of the part selected or the form in which the
selected part is viewed is known as view port.

44. Define clipping?
Clipping is the method of cutting a graphics display to neatly fit a predefined
graphics region or the view port

45. What is the need of homogeneous coordinates?
To perform more than one transformation at a time, use homogeneous
coordinates or matrixes. They reduce unwanted calculations intermediate steps
saves time and memory and produce a sequence of transformations.

46. Distinguish between uniform scaling and differential scaling?
When the scaling factors sx and sy are assigned to the same value, a uniform
scaling is produced that maintains relative object proportions. Unequal values for
sx and sy result in a differential scaling that is often used in design application

47. What is fixed point scaling?
The location of a scaled object can be controlled by a position called the
fixed point that is to remain unchanged after the scaling transformation.

48. What is Bezier Basis Function?
Bezier Basis functions are a set of polynomials, which can be used instead
of the primitive polynomial basis, and have some useful properties for interactive
curve design.

49. What is surface patch
A single surface element can be defined as the surface traced out as two
parameters (u, v) take all possible values between 0 and 1 in a two-parameter
representation. Such a single surface element is known as a surface patch.

50. Define B-Spline curve?
A B-Spline curve is a set of piecewise(usually cubic) polynomial segments that
pass close to a set of control points. However the curve does not pass through these
control points, it only passes close to them.

51. What is a spline?
To produce a smooth curve through a designed set of points, a flexible strip called
spline is used. Such a spline curve can be mathematically described with a piecewise
cubic polynomial function whose first and second derivatives are continuous across
various curve section.

52. What are the different ways of specifying spline curve?
• Using a set of boundary conditions that are imposed on the spline.

• Using the state matrix that characteristics the spline
• Using a set of blending functions that calculate the positions along
the curve path by specifying combination of geometric constraints on
the curve

53. What are the important properties of Bezier Curve?
• It needs only four control points
• It always passes through the first and last control points
• The curve lies entirely within the convex half formed by four control
points.

54. Define Projection?
The process of displaying 3D into a 2D display unit is known as
projection. The projection transforms 3D objects into a 2D projection
plane

55. What are the steps involved in 3D transformation?
• Modeling Transformation
• Viewing Transformation
• Projection Transformation
Workstation Transformation

56. What do you mean by view plane?
A view plane is nothing but the film plane in camera which is positioned
and oriented for a particular shot of the scene.

57. Define projection?
The process of converting the description of objects from world
coordinates to viewing coordinates is known as projection

58. What you mean by parallel projection?
Parallel projection is one in which z coordinates is discarded and parallel
lines from each vertex on the object are extended until they intersect the view
plane.

59. What do you mean by Perspective projection?
Perspective projection is one in which the lines of projection are not
parallel. Instead, they all converge at a single point called the center of projection.

60. What is Projection reference point?
In Perspective projection, the lines of projection are not parallel. Instead,
they all converge at a single point called Projection reference point.

61. Define computer graphics animation?
Computer graphics animation is the use of computer graphics equipment
where the graphics output presentation dynamically changes in real time. This is
often also called real time animation.

62. What is tweening?
It is the process, which is applicable to animation objects defined by a
sequence of points, and that change shape from frame to frame.

63. Define frame?
One of the shape photographs that a film or video is made of is known as
frame.

64. What is key frame?
One of the shape photographs that a film or video is made of the shape of
an object is known initially and for a small no of other frames called keyframe

65. Define Multimedia
Multimedia is the use of the computer to present and combine text,
graphics, audio and video with links and tools that lets the user to navigate,

interact, create and communicate.

66. What is multimedia PC:

A multimedia PC is a computer that has a CD-ROM or DVD drive and supports 8-bit and 16-bit waveform audio recording and playback, MIDI sound synthesis, and MPEG movie watching, with a central processor fast enough and a RAM large enough to enable the user to play and interact with these media in real time, and with a hard disk large enough to store multimedia works that the user can create.

67. Where to use multimedia?

Multimedia improves information relation. Multimedia applications includes the following:

_ Business
_ Schools
_ Home
_ Public place

68. List out the benefits of multimedia

Benefits of multimedia are

_ Training
_ Sales
_ Communications
_ Medicines

69. What is hypermedia?

A set of documents in which a given document can contain text, graphics video and audio clips as well as embedded references to other documents world wide web pages are hypermedia documents.

70. What is hypertext?

Hyper text is an application of indexing text to provide a rapid search of specific text strings in one or more documents. Hypertext is an integral part of hypermedia documents. In multimedia applications, a hypermedia documents is the basic complex object of which text is a sub-object. Other sub-objects in the basic object include images, sound, and full-motion video.

71. List out the building blocks of multimedia.

_ Text
_ Image
_ Sound
_ Animation
Video

72. What are the main functions of a multimedia development system?

Multimedia development system must perform main three functions as follows:

_ Input data
_ Development
_ Data output

Data input from sources such as cameras or musical instruments, application development, and data output to some delivery medium such as a videodisk or CD-ROM.

73. Define Typeface

Typeface is measured in point sizes, where one point is approximately 1/72 of an inch. It is a measure of the height of the metal blocks containing letters.

74. Define the following:

(i) X-height (ii) Set (iii) Kerning

X-height: The X-height is the measurement of the height of the character X, in other words of the middle bit without any ascender or descender.

(ii) **Set:** The width of the letters is called the set and is fixed relative to the point-size.

(iii) **Kerning:** The spaces between letters in one world (tracking) can be adjusted in a process called kerning.

75. Define the following respective to sound:

(i) Waveform (ii) Frequency (iii) Amplitude

i) Waveform

Sound is produced by the vibration of matter. During the vibration pressure variation are created in the air surrounding it. The pattern of the oscillation is called a waveform.

(ii) Frequency

The frequency of the sound is the reciprocal value of the period. It represents the number of period s in a second and it is measured in Hertz (Hz) or cycles per second.

(iii) Amplitude

A sound also has amplitude. The amplitude of a sound is a measure of the displacement of the air pressure wave from its, or quiescent state.

76. Define quantization (or) resolution?

The resolution (or) quantization of a sample value depends on the number of bits used in measuring the height of the waveform. An 8-bit quantization yields 256 possible values, 16-bit CD-qudra quantization results in over 65536 values.

77. What are the types of sound objects that can be used in multimedia production?

There are four types of sound objects that can be used in multimedia production:

_ Waveform audio

_ MIDI sound tracks

_ Compact disc (CD) audio

_ MP3 files

78. What is MIDI?

Musical Instrument Digital Interface (MIDI) is the interface between electronic musical instruments and computers is a small piece of equipment that plugs directly into the computer's serial port and allows the transmission of music signal. MIDI is considered to be the most compact interface that allows full-scale output.

79. List out the components of MIDI interface.

A MIDI interface has two different components:

_ Hardware

_ Data format

Hardware connects the equipment. It specifies the physical connection between musical instruments, stimulate that a port MIDI port is built into an instrument, specifies a MIDI cable and deals with electronic signals t that are sent over the cable.

Data format encodes the information traveling through the hardware MIDI data format includes an instrument –connected data format. The encoding includes, besides the instrument specification, the notion of the beginning and end

of a note, basic frequency and sound volume; MIDI data allow an encoding of about 10 octaves, which corresponds to 128 notes.

80. Define the term flicker in video.

A periodic fluctuation of brightness perception is called flicker effect.

81. Define Random scan/Raster scan displays?

Random scan is a method in which the display is made by the electronic beam which is directed only to the points or part of the screen where the picture is to be drawn.

The Raster scan system is a scanning technique in which the electrons sweep from top to bottom and from left to right. The intensity is turned on or off to light and unlight the pixel.

82. What is an MPC?

The MPC computer is not a hardware unit but rather a standard that includes minimum specifications to turn Intel microprocessor-based computers into multimedia computers.

83. List all the MPC standards

There are currently three MPC standards as follows

_ MPC Level 1

_ MPC Level 2

_ MPC Level 3

The standards apply not only to desktop computers but also to increasingly more powerful multimedia laptops.

84. What is configuration of MPC level 1 standards?

The MPC level 1 minimum standard workstation consisted of a 16MHz 386SX microprocessor, atleast 2MB of RAM, a 30MB Hard disk, a CD-ROM drive, VGA video (16 colors), an 8-bit audio board, speakers and/or headphones, and Microsoft windows software with the Multimedia Extensions package.

85. Write the configuration of MPC level 2 standards.

MPC level 2 minimum standard consisted of a 25MHz 486SX microprocessor with atleast 4MB of RAM, a 3.5-inch high density, a 160 MB or larger hard disk drive, and a CD-ROM drive capable of sustained 300k per second transfer rate with CD-DA outputs and volume control, 16-bit sound capability with microphone input, and a color monitor with display resolution of atleast 640 X 480 with 65,536(64k) colors.

86. List out the input devices of multimedia.

Input devices for a multimedia system are as follows:

_ Keyboards

_ Mouse

_ Trackball

_ Touch screen

_ Magnetic card Encoders and Readers

_ Graphics Tablets

_ Scanners

_ Optical Character Recognition (OCR) devices

_ Voice Recognition Systems

_ Digital cameras

87. What is a Video disk?

Video disk serves as the output of motion pictures and audio. The data are stored in an analog-coded format on the disk. The reproduced data meet the

highest quality requirements. Video disk has a diameter of approximately 30cm and stores approximately 2.6 Giga bytes.

88. What is synchronization?

Integration of the different media is given through a close relation between information units. This is called synchronization.

89. What is meant by Multimedia User Interface?

Multimedia user interface is a computer interface that communicates with users multiple media.

90. Define the following terms:

(i) Compression Ratio (ii) Image Quality

(i) Compression Ratio: The Compression Ratio represents the size of the original image divided by the size of the compressed image.

(ii) Image Quality: Compression ratio typically affects picture quality, the higher the compression ratio, the lower the quality of the decompressed image.

91. What are the higher levels of multimedia communication system (MCS)?

The higher layers of the multimedia communication system are divided into two architectural subsystems:

• Application subsystem

• Transport subsystem.

92. Define collaborative computing environment?

The recent infrastructure of networked workstations and pcs, and the availability of audio and video at these end points, makes it easier to people to cooperate and bridge space and time. In this way, network connectivity and endpoint integration of multimedia provide users with a collaborative computing environment. It is generally known as computer supported cooperative work (CSCW).

93. List out the tools for collaborative computing

The tools used for collaborative computing are as follows:

• Electronic mail

• Bulletin boards(e.g. Usenet news)

• Screen sharing tools(e.g. show me from sunsoft)

• Text-based conferencing systems (e.g. Internet relay chat, CompuServe, America online).

• Telephone conference systems.

• Conference rooms(e.g. video window from Bellcore)

• Video conference systems(e.g.,Mbone tools)

94. What is group communication (GC)?

Group communication (GC) involves the communication of multiple users in a synchronous or an asynchronous mode with centralized or distributed control.

95. What are the consistent of a group communication?

Group communication architecture consists of the following:

• Support model

• System model

• Interface model

The GC support model includes group communication agents that communicate via a multi-point multi-cast communication network.

96. Define the term Group Rendezvous?

Group rendezvous denotes a method, which allows one to organize meetings and to get information about the group, ongoing meetings and other

static and dynamic information.

97. List out some examples for interface model

protocols. Synchronous rendezvous methods use:

• Directory services

• Explicit invitations

Directory services access information stored in a knowledge base about the conference, such as the name of the conference, registered participants, authorized users and name and role of the participants

98. What are the advantages and disadvantages of replicated

architecture? The advantages of replicated architecture are:

• Low network traffic

• Low response times

Low network traffic is because only input events are distributor among the sites and low response times, since all participants get their output from local copies of the application.

The disadvantages are the requirement of the same execution environment for the application of each site, and the difficulty in maintaining consistency.

99. What are the advantages and disadvantages of centralized conference control?

The advantage of the centralized conference control is guaranteed consistency of the conference state. The disadvantage is that when a new participant (outside of the invited group) wants to join, explicit exchange of the conference state must be performed among all participants, which causes large delays.

100. What are the advantages of distributed conference control?

Advantages of distributed conference control are:

• Inherent fault tolerance-If a network connection breaks down in the middle of a conference and it is repaired, it is easier to re-establish the shared conference state since there is no strict consistency requirement.

• Scaling properties-At some point refresh periodicity needs to adapt to the size and scope of the conference, otherwise, the conference may be in danger of flooding itself with session reports.

101. What is a session manager?

Session management architecture is built around an entity session manager, which separates the control from the transport. By creating a reusable session manager, which is separated from the user interface, conference oriented tools avoid a duplication of their effort.

102. List the various functionalities of session manager

Session manager includes local and remote functionalities.

Local functionalities include:

• Membership control management

• Floor control

• Media control management

• Configuration management

• Conference control management

103. What are the contents of synchronization?

Synchronization in multimedia systems comprises of content, spatial and temporal relations between media objects.

104. What is presentation requirement?

Presentation requirements consist of intra-object synchronization, the

accuracy concerning delays in the presentation of LDUs and, for inter-object synchronization, the accuracy in the parallel presentation of media objects.

Part- B (16 marks Questions)

1. Briefly explain about video display devices with necessary diagram?

(16) Video display devices: CRT, raster scan display, random scan display.

(16) Explain: CRT: basic design of CRT, electron gun-heated metal cathode, control grid, focusing system.

raster scan display, random scan display.

-Draw the necessary diagrams.

Properties of video display devices- persistence, resolution, aspect ratio.

2. Explain Bresenham's Line Drawing Algorithm with Example.

1) Input two line end points and store the left endpoint in (X_o, Y_o)

2) Load (X_o, Y_o) in to the frame
buffer ie) Plot in the first point

3) Calculate constants $\_x, \_y, 2\_y, 2\_y - 2\_x$ and obtain the starting value for the decision parameter as

$Po = 2\_y - \_x$

4) At each X_k along the line, starting at k=0 perform the following
test ie) If $PK < 0$ the next point to plot is $X_k + 1$, Y_k and

$P_{k+1} = P_k + 2\_y$

Otherwise, the next point to plot is

(X_{k+1}, Y_{k+1}) and $P_{k+1} = P_k + 2\_y - 2\_x$

5) Repeat step 4 $\_x$ times

Example

X1=5

Y1=10

X2=10

Y2=20

dx =5

dy=10

$P = 2*dy - dx = 2*10 - 5 = 20 - 5 = 15$

Increments for the successive decision parameter is

2dy=2*10=20

2dy - 2dx = 2 * 10 - 2 * 5 =20 - 10 =10

If 5 > 10 (false)

X=5

Y=10

Xend =10

Setpixel(5,10)

While 5 < 10

X=6

If (15<0) then (false)

P + = 2dydx

Y=10+1 =11

P= 10 + 2 * (15-10) = 10+10=20

Setpixel (6, 11)

Etc

….

Procedure

Procedure linebres(xa , ya ,xb ,yb : integer)
Var
dx, dy, x, y, xEnd, p : integer ;
begin
dx := abs(xa – xb) ;
dy := abs(ya – yb) ;
p := 2* dy – dx ;
if xa > xb then
be gin
x := xb ;
y := yb ;
xEnd := xa;
end
else
begin
x := xa ;
y := ya ;
xEnd := xb;
end
setpixel (x, y, 1);
While x < xEnd do
Begin
x := x + 1 ;
if p < 0 then p := p + 2 * dy;
else
Begin
y := y+1;
p := p + 2 * (dy – dx);
End
Setpixel (x, y, 1);
End
End (Line Bres)

3. Define Clipping. Write and explain Cohen – Sutherland line clipping algorithm.

A Procedure that identifies those portions of a picture that are either inside or
outside of a specified region of space is referred to as a Clipping
In this method processing of line segments by performing initial tests that
reduce the number of intersections that must be calculated. Every line endpoint in a
picture
is assigned a four-digit binary code , called region code that identifies the location of
the point relative to the boundaries of the clipping rectangle. Regions are setup in
reference to the boundaries . Each bit position in the region code is used to indicate
one of the four relative coordinate positions of the point with respect to the clip
window: to the left ,right, top or bottom. By numbering the bit positions in the region
code as 1 through 4 from right to left, the coordinate regions can be correlated with
the bit positions are
bit 1 : left
bit 2 : right
bit 3 : below

bit 4 : above

pic

A value of 1 in any bit position indicates that the point is in relative position;
Otherwise the bit position is set to 0. If a point is within the clipping rectangle,
The region code is 0000. Apoint that is below and to the left of the rectangle has a region code of 0101.

Bit values in the region code are determined by comparing endpoint coordinate values (x,y) to the clip boundaries. Pic.

Bit 1 is set to 1 if x < xwmin . The other three bit values are determined using similar comparisions.

Region code bit values can be determined with following 2 steps

1) Calculate differences between endpoint coordinates and clipping boundaries.

2) Use the resultant sign bit of each difference calculation to set the corresponding value in the region code.

Bit 1 is the sign bit of x-xwmin

Bit 2 xwmax – x

Bit 3 y – ywmin

Bit 4 ywmax – y

Pic)

Intersection points with a clipping boundary can be calculated nusing the slope intercept form of the line equation . for a line with endpoint coordinates (x1 , y1) and (x2, y2) the y coordinate of the intersection point with a vertical boundary can be obtained with the calculation

y = y1 + m(x-x1)

where x value is set either to xwmin or to xwmax and the slope of the line is calculated as

m = (y2 – y1) / (x2 – x1)

similarly ,the x coordinate can be calculated as

x = x1 + (y-y1)/m

with y set either to ywmin to ywmax

Algorithm for line clipping for cohen Sutherland line clipping method.

4. Explain Reflection and shearing.

A reflection is a transformation that produces a mirror image of an object. The mirror image for a two dimensional reflection is generated relative to an axis of reflection by rotating the object 1800 about the reflection axis. We can choose an axis of reflection in the xy plane or perpendicular to xy plane. When the reflection axis is a line in the xy plane, the rotation path about this axis is in a plane perpendicular to the xy plane, the rotation path is in the xy plane.

Pic.

Reflection about the line y = 0 , the x axis, is accomplished with the transformation matrix

1 0 0
0 -1 0
0 0 1

pic

A reflection about the y axis flips x coordinates while keeping y coordinates the same. The matrix for this transformation is

-1 0 0
0 1 0
0 0 1

pic

We flip both the x and y coordinates of a point by reflecting relative to an axis that is perpendicular to the xy plane and that passes through the coordinate origin. This transformation has the matrix representation

-1 0 0
0 -1 0
0 0 1

pic

If we choose the reflection axis as a diagonal line y = x the reflection matrix is

0 1 0
1 0 0
0 0 1

pic

To obtain a transformation matrix for reflection about the diagonal y = -x

We could concatenate the matrices for the transformation sequence

1. Clockwise rotation by 450
2. reflection about y axis and
3. counter clockwise rotation by 450

the resulting transformation matrix is

0 -1 0
-1 0 0
0 0 1

Shearing

A transformation that distorts the shape of an object such that the transformed
Shape appears as if the object were composed of internal layers that had been caused to slide over each other is called a shear.

pic

An x- direction shear relative to the x axis is produced with the transformation matrix

1 shx 0
0 1 0
0 0 1

which transforms coordinate positions as

x' = x+shx
y'=y

An real number can be assigned to the shear parameter shx. A coordinate position (x,y) is then shifted horizontally by an amount proportional to its distance (y value) from the x axis (y=0) Setting shx to 2 for example, changes the square into parallelogram.

Pic

Negative values for shx shift coordinate positions to the left.

We can generate x – direction shears relative to other reference lines with

1 shx -shx . yref
0 1 0
0 0 1

with coordinate positions transformed as

x'= x+shx(y-yref)
y'= y

pic

A Y direction shear relative to the line x=xref generated with the transformation matrix

1 0 0

shy 1 -shy . xref

0 0 1

pic

which generates transformed coordinate positions

x'= x

y'= shy(x-xref)+y

This transformation shifts a coordinate position vertically by an an amount proportional to its distance from the reference line x = xref

5. Explain Basic Transformations with procedure

Transformation

Changes in orientation , size, and shape are accomplished with geometric Transformations that alter the coordinate descriptions of the object

The basic transformations are

a) Translation

b) Rotation

c) Scaling

Translation

A translation is applied to an object by repositioning it along a straight line path from one coordinate location to another. We translate a 2 dimensional point by adding translation distances tx and ty , to the original coordinate position (x, y) to move the point to a new position (x', y')

x' = x + tx

y' = y + ty

The translation distance pair (tx, ty) is called translation vector or shift vector.

We can express the translation equations as a single matrix equation by using column vectors to represent coordinate positions and the translation vector

P = x1 P' = x1' T = tx

x2 x2' ty

Therefore P' = P + T

Fig

Rotation

A 2 dimensional rotation is applied to an object by repositioning it along a circular path in the xy plane. To generate a rotation , we specify a rotation angle theta and the position (xr, yr) of the rotation point about which the object is to be rotated.

We first determine the transformation equations for rotation of a point position P when the pivot point is at coordinate origin. Fig

Using the standard trigonometric identities , we can express the transformed coordinates in terms of angles _ and _ is

x' = rcos(_ + _) = rcos _cos _ – rsin _ sin _

y' = rsin (_ + _) = rcos_sin _ + rsin_cos _---------I

The original coordinates of the point in polar coordinates are

x= rcos _ and y= rsin _--------------------II

Substituting the values of II to I we obtain the transformation equations for rotating a point at position (x,y) through an angle _ about the origin

x'= xcos _ - ysin _

y'=xsin _ - ycos _

Therefore,

P' = R . P

Scaling

Scaling transformation alters the size of an object. This operation can be carried out for polygons by multiplying the coordinate values (x, y) of each vertex by scaling factors sx and sy to produce the transformed coordinates (x', y')

x' = x . sx

y' = y.sy

Scaling factor sx scales objects in the x direction, which sy scales in the y direction.

The matrix form of transformation is

x' = sx 0 x

0 sy . y

y'

P' = S . P

When sx and sy are assigned the same value,a uniform scaling is produced that maintains relative object proportions. Unequal values for sx and sy result in a differential scaling hat is often used in design applications.

We can control the location of a scaled object by choosing a position , called the fixed point that is to remain unchanged after the scaling transformation.

Pic

Coordinates for the fixed point (xf,yf) can be chosen as one of the vertices.

For a vertex with coordinates (x,y) the scaled coordinates (x' ,y') are calculated as

x' = xf + (x – xf)sx

y'= yf + (y - yf) sy

We can rewrite these scaling transformations to separate the multiplicative and additive terms.

x'= x.sx + xf(1-sx)

y'= y.sy +yf(1-sy)

where the additive terms xf(1 – sx) and yf(1- sy) are constant for all points in the object.

6. Explain i) LCD

ii) LED

i) LCD (Liquid Crystal
Display) Used in TV,
calculator, etc.

Produce picture by passing polarized light from the surrounding or from an internal light source through a liquid crystal materials

Liquid crystal refers the fact that these compounds have a crystalline arrangement of molecules . They flow like a liquid. So it called LCD.

Requires two glass plates. Each contains a light polarized at right angles to each other . Rows of horizontal transparent conductor contains one glass plate. Columns of vertical transparent conductor contains another glass plate.

Intersections of two defines a pixel position. Molecules are aligned on ―On State‖.

Polarized light passing through the material is twisted. So that it passes to the opposite polarizer. Then light is reflected back to the view. To

Turn off the pixel apply voltage to the two intersecting conductors so that the light is not twisted. This is referred as passive matrix.

Pixel is stored in frame buffer. Refresh at a rate of 60 frames/ sec

Another Method for constructing LCD's

Place a transistor at each pixel position using thin film transistor. Transistors are used to control the voltage at pixel locations to prevent charge from leaking out of the liquid crystal.

ii)LED (Light Emitting Diodes)

A matrix of diodes are arranged to form the pixel positions to display. The picture definition is stored in refresh buffer Just like scan line , it need data from the refresh buffer and convert into voltage level depends upon the intensity value that are applied to diodes.

7. Explain projections in detail

Projection is mainly classified as

a. Parallel projection

b. Perspective projection

Parallel projection

Co-ordinate positions are transformed to the view along the parallel line.

We can specify a parallel projection with a projection vector that defines the direction for the projection lines.

Orthographic Parallel Projection

When the projection is perpendicular to the plane it is called Orthographic Parallel Projection

It is used to produce front , rear and top views of an object. Front and rear are called elevations. And top view is called plane view.

We can also form orthographic projections that display more than one face of an object. Such views are called Axonometric Projections.

Eg. Isometric Projections

Isometric Projection

Aligning the projection plane so that it intersects each coordinate axis in which the object is defined at the same distance from the origin.

If the view plane is placed in the Zvp along Zv axis and any point (x,y,z) in viewing coordinate is transformed to projection co ordinates as

$Xp = x$

$Yp=y$

Where Z - > depth Information

Pic

Obilique projection

View plane is not perpendicular to projected line

Oblique projection is specified with two angles _ , _

Point x,y,z is projected to (xp, yp) to the viewplane.

Orthographic projection is (x,y)

_ is angle with the line on the projection plane.

L is Line length

_ is angle of the line on the projection plane.

Projection co ordinates are

$Xp = x+ Lcos$ _

$Yp = y+Lsin$ _

The position of the point on Z axis is

Tan _ $=Z/L$

$L=z/ Tan$ _ $=ZL1$

Perspective Projection

Object positions are transformed to the view plane along lines that converge to a point called projection.

We transform points along projection lines that meet at the PRP

We set the projection reference point at position Zprp along Zv axis and the view plane at Zvp

Let x' , y' , z' be any of point on the projection line then the eqns are

X'= x-xu

Y'=y-yu

Z'= z-(z-zprp)U

U can have values from o to 1

When U = 0 , position P = (x, y, z)

When U = 1 , Position P = (0,0,Zprp)

8. Explain Bezier Curves in detail

Bezier curve uses spline approximation method and widely used in CAD. This was developed by French Engineer Pierre Bezier

Bezier Curves

Curve section is approximated and their relative position determine the degree of polynomial

Blending Function specification is convenient

N+1 control points , Pk = (xk, yk, zk) with K From 0 to n. They can be blended to P(U) which describes path between P0 and Pu

P(U)= _n

k=0 Pk BEZ k,n(U)

Bezier blending functions BEZk,n(U) are the Bernstein Polynomials

BEZk,n(U) = C(n,k) Uk (1-U) n-k

We can define Bezier Blending functions with recursive calculation

BEZk,n(U) =(1-U) BEZk,n-1 + U BEZk-1,n-1(U)

With BEZk,k = U k and BEZ0,k=(1-U)k

The curve lies within the convex hull. The blending functions are all positive and their sum is always 1

Convex Rule property ensures the polynomial smoothly follows the control point.

Cubic Bezier Curves

Many graphics packages provide only cubic spline function. They are generated with four control points.

Four blending functions for cubic Bezier Curve is obtained by putting n=3

BEZ0,3(U) = (1-U)3

BEZ1,3(U) = 3U(1-U)2

BEZ2,3(U) = 3U2(1-U)

BEZ3,3(U) = U3

Properties of Bezier Curves

Always passes through the first and last control point

The boundary conditions at two ends are

P(0) = Po

P(1) =Pn

9. Explain animation in detail

The term computer animation generally refers to any time sequence of visual changes in a scene

Design of animation sequence

Steps are

1. Story board layout

2. Object definitions

3. Key frame specification

4. generation of in between frames

For frame by fame animation, each frame of the scene is separately generated and

stores. The story board is an outline of the action. It defines the motion sequence as a set of basic events that are to take place. Depending on the type of animation to be produced. The story board is an outline of the action.

An Object definition is given for each participant in the action. Objects can be defined in terms of basic shapes such as polygons or splines.

A key frame is a detailed drawing of the scene at a certain time in the
Animation sequence.

There are several other tasks that may be required , depending on the application. They include motion verification , editing and production
And synchronization of a sound track.

General computer animation Functions

Object manipulations and rendering , camera motions and the generation of in betweens One function available in animation package is provided to store and manage the object data base

Another typical function stimulates camera movements.

Raster Animations

A simple method for translation in the xy plane is to transfer a rectangular block of pixel values from one location to another

To rotate a block of pixels, we need to determine the percent of area coverage for those pixels that overlap the rotated block.

10. Explain i) Back face Detection method
ii) Depth buffer method for detection

i. Back Face Detection Method

A fast and simple object space method for identify the backface of a polyhedron is based on the inside outside tests.

A point (x, y, z) is inside the polygon surfaces with plane parameters A,B,C, & D if
$Ax + By + Cz + D < 0$

When an inside point is along the line of sight to the surface, the polygon must be a backface.

If N is normal vector to the polygon surface , V is a vector viewing direction from eye or camera then this polygon is a backface
$V . N > 0$

ii) Depth Buffer Method (Z – Buffer Method)

Image space approach for polygon surfaces. Each pixel position (x,y) on view plane , object depth can be compared by compared Z values. Z ranges from 0 to Zmax, z max can be set to 0 or to the largest value.

Two buffers are necessary. A depth buffer is used to store depth values of each (x,y) position and refresh buffer to store intensity for each position. Intensity buffer is set to 0(min) and refresh buffer is initialized to background intensity.

The depth is calculated for each position . If it is greater than value stored in depth buffer, the new value is stored.

The Algorithm is

1. Initialize the depth buffer & refresh buffer. So that depth (x,y) =0 refresh (x,y)=1
2. For each position on each polygon surface compare depth values to previously stored values in the depth buffer to determine visibility.

Calculate the depth z for each (x, y) position on the polygon

If Z < depth (x,y) then set depth (x,y) = Z

refresh (x, y) =Isurf (x, y)

I is the value for background intensity.

11. Explain applications of Computer graphics

• Image Processing
• Computer Aided Design (CAD)
• Education
• Entertainment
• Graphical User Interface (GUI)
• Morphing
• Animation
• Visual Programming

12. Explain a. Depth Cueing b. Surface Rendering

a.Depth Cueing
A simple method for indicating depth with wire frame displays is to vary the intensity of objects according to their distance from the viewing position
- Line closest to the viewing position are displayed with highest intensities
- Lines Farther - > Decreasing
Intensities Uses
Choosing maximum and minimum intensities
Range of distances over which the intensities are to vary
Modeling the effect of atmosphere
b. Surface Rendering
Realism is attained by setting the surface intensity of objects according to
1. Lighting conditions in the scene
- The intensity and positions of light sources
- The general background illumination required for a scene
2. Assigned surface characteristics
- Degree of transparency
- How rough or how smooth the surfaces to be.

13. Explain 3D transformations in detail

Inclusion of Z coordinates
Translation
Explanation
Matrix form
Rotation
Explanation
Matrix Form
Scaling
Explanation
Matrix Form

14. Explain the classification of Visible surface Detection methods with example.

Broadly classified in to 2 categories
i. Object space methods
Compare objects and part of objects to each other within the scene
definition to which surfaces as a whole should label as visible
Eg. Back face detection
Back Face Detection Method
A fast and simple object space method for identify the backface of a polyhedron is based on the inside outside tests.
A point (x, y, z) is inside the polygon surfaces with plane parameters A,B,C, & D if
$Ax + By + Cz + D < 0$

When an inside point is along the line of sight to the surface, the polygon must be a backface.

If N is normal vector to the polygon surface , V is a vector viewing direction from eye or camera then this polygon is a backface

$V . N > 0$

ii. Image space methods

Visibility is decided point by point at each pixel position on the projection plane

Eg. Depth buffer method

ii) Depth Buffer Method (Z – Buffer Method)

Image space approach for polygon surfaces. Each pixel position (x,y) on view plane , object depth can be compared by compared Z values. Z ranges from 0 to Zmax, z max can be set to 0 or to the largest value.

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I is the value for background intensity.

15. Explain about the following.

(i). Flat panel displays (10)

(ii).Graphics Software (6)

(i).Explain: Flat panel display- (10)

emissive display-plasma panel, thin film electro luminescent display,

light emitting diode.

non emissive display- liquid crystal display.

(ii). Short notes on graphics software (6)

16. (i).Show how the shear transformation may be expressed in terms of rotation and scaling.(8)

(ii). Scale the polygon with coordinates A(2,5), B(7,10) and C(10,2) by two units in x direction and two units in y direction. (8)

17. Briefly explain about DDA line drawing algorithm .Give one example using this algorithm.(16)

Explain about DDA line drawing algorithm. Write algorithm and give one example using this algorithm.(16)

18. Explain about the following.

(i).Shadow mask method (8)

(ii).Liquid crystal display(8)

Explain about the following

(i).Shadow mask method (8)

(ii).Liquid crystal display(8)

19. Explain the basic Building blocks of multimedia?

_ Text

_ Image
_ Sound
_ Video
_ Animation

20. How will you manipulate images and graphics in multimedia? Explain in detail.

Images
Making still images
Bitmaps
Graphics

21. What are the various aspects of video signal? Explain in detail. Give details about computer video formats also.

_ Recording formats
_ Digital Video

22. What are the basic tools that are required for the multimedia Software? Explain in detail.

o Text Editing & Word Processing Tools
o Painting & Drawing Tools
o Image – Editing Tools
o Sound Editing Tools
o Animation, video & Digital Movie Tools

23. What are the various input and output devices that can be used in a Multimedia PC? Explain in detail.

Input devices
• Keyboards
• Mouse
• Trackball
• Touch screens
• Magnetic card Encoders & Readers
• Graphic tablets
• Flat – bed scanner
• Optical Character Recognition
• Infrared Remote
• Voice Recognition
• Digital Cameras

Output devices
• Audio devices
• Amplifier & Speaker
• Monitors
• Video Devices
• Projectors
• Printers

24. Explain the Multimedia communication in detail?

_ Collaborative Computing.
_ GC Architecture.
_ Conferencing.
_ Session management.
_ Centralized and distributed architecture
_ Layer's protocols

25. Explain the presentation requirements

_ Lip synchronization requirements.
_ Pointer synchronization requirements.
_ Elementary media synchronization.