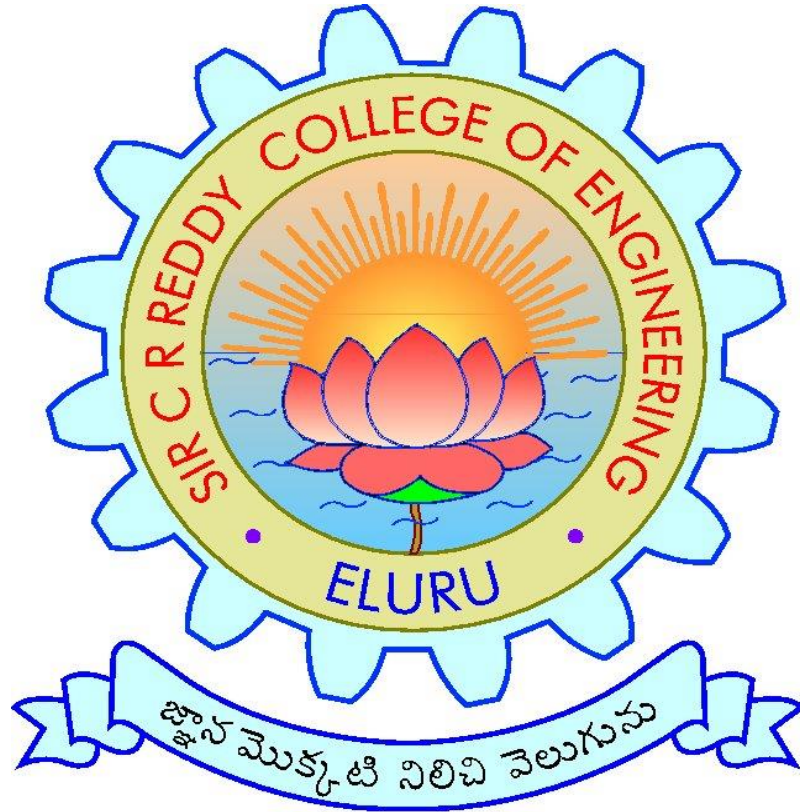


SIR C.R.REDDY COLLEGE OF ENGINEERING, ELURU
DEPARTMENT OF INFORMATION TECHNOLOGY
COURSE HANDOUT



SUBJECT: ADVANCED COMPUTER NETWORKS

CLASS: IV/IV B.Tech. I SEMESTER, A.Y.2022-23

INSTRUCTOR: SRI N.PRASAD

Course Handout Index

S. No	Description
1	College Vision & Mission
2	Department Vision & Mission
3	Program Educational Objectives (PEOs)
4	Program Outcomes (POs)
5	Program Specific Outcomes (PSOs)
6	JNTUK Academic Calendar
7	Department Academic Calendar
8	Course Description
9	Course Objectives
10	Course Outcomes
11	Lesson Plan
12	Evaluation Pattern
13	Timetable
14	Unit wise Questions

College Vision & Mission

Vision: To emerge as a premier institution in the field of technical education and research in the state and as a home for holistic development of the students and contribute to the advancement of society and the region.

Mission: To provide high quality technical education through a creative balance of academic and industry oriented learning; to create an inspiring environment of scholarship and research; to instill high levels of academic and professional discipline; and to establish standards that inculcate ethical and moral values that contribute to growth in career and development of society in general.

Department Vision & Mission

Vision: To be a premier department in the region in the field of Information Technology through academic excellence and research that enable graduates to meet the challenges of industry and society.

Mission: To Provide dynamic teaching-learning environment to make the students industry ready and advancement in career; to inculcate professional and leadership quality for better employability and entrepreneurship; to make high quality professional with moral and ethical values suitable for industry and society.

Program Educational Objectives (PEOs)

PEO1: Solve real world problems through effective professional skills in Information Technology industry and academic research.

PEO2: Analyze and develop applications in Information Technology domain and adapt to changing technology trends with continuous learning.

PEO3: Practice the profession in society with ethical and moral values.

Program Outcomes (POs)

PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using the first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/Development of Solutions: Design solutions for complex engineering problems and system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, society, and environmental considerations.

PO4: Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the professional engineering solutions in society and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multi-disciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi-disciplinary environments.

PO12: Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

PSO1: Design Skill: Design and develop softwares in the area of relevance under realistic constraints.

PSO2: New Technology: Adapt new and fast emerging technologies in the field of Information Technology.

JNTUK Academic Calendar

Website: www.jntuk.edu.in
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Phone: 0884-2300991

Directorate of Academic Planning
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA-533003, Andhra Pradesh, INDIA
(Established by AP Government Act No. 30 of 2008)

Lr. No. DAP/AC/IV Year /B. Tech/B. Pharmacy/2022

Date 25.06.2022

Dr. KVSG Murali Krishna,
M.E, Ph.D.,

Director, Academic Planning
JNTUK, Kakinada

To
All the Principals of Affiliated Colleges,
JNTUK, Kakinada.

Academic Calendar for IV Year - B. Tech/B. Pharmacy for the AY 2022-23

I SEMESTER			
Description	From	To	Weeks
Commencement of Class Work	04.07.2022		
I Unit of Instruction	04.07.2022	27.08.2022	8W
I Mid Examinations	29.08.2022	03.09.2022	1W
II Unit of Instructions	05.09.2022	29.10.2022	8W
II Mid Examinations	31.10.2022	05.11.2022	1W
Preparation & Practicals	07.11.2022	12.11.2022	1W
End Examinations	14.11.2022	26.11.2022	2W
Commencement of II Semester Class Work	05.12.2022		
II SEMESTER			
I Unit of Instructions	05.12.2022	28.01.2023	8W
I Mid Examinations	30.01.2023	04.02.2023	1W
II Unit of Instructions	06.02.2023	01.04.2023	8W
II Mid Examinations	03.04.2023	08.04.2023	1W
Preparation & Practicals	10.04.2023	15.04.2023	1W
End Examinations	17.04.2023	29.04.2023	2W


Director, 25/6/22
Academics & Planning,
Director
Academic Planning
JNTUK Kakinada

Copy to the Secretary to the Hon'ble Vice Chancellor, JNTUK
Copy to Rector, Registrar, JNTUK
Copy to Director Academic Audit, JNTUK
Copy to Director of Evaluation, JNTUK

Department Academic Calendar



Department of Information Technology IV/IV B.Tech Academic Calendar for 2022-23

2022-23	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M					
Jul 22						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						
Aug 22	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31											
Sep 22				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30									
Oct 22						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						
Nov 22		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30											
Dec 22					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31							
Jan 23	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31											
Feb 23				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28											
Mar 23			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31									
Apr 23					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30								
May 23	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31											
Jun 23				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30									

List of Holidays	Oct 9: Maulud Nabi	Mar 22 : Ugadhi	Mid exams
July 10: Bakrid	Oct 24 : Diwali	Mar 30: Surrana navami	End Examinations
Aug 9: Moharum	Dec 25 : Christmas	Apr 5: Babu Jagivan Ram Jayanthi	Commencement of Class work
Aug 15: Independence day	Jan 14-16: sankranti	Apr 7: Good friday	Workshops
Aug 31: Ganesh Chaturdi	Jan 26: Republic Day	Apr 14: Ambedkar Jayanthi	Department fest/Elite
Oct 2: Gandhi jayanthi	Feb 18 : Sivaratri	Jun 29: Bakrid	
Oct 5: Vijayadasami	Mar 8 : holi		
			HoD
			Department of IT

Course Description

This subject covers advanced topics in Data Communication and Computer Networks, gain core knowledge of Network layer routing protocols and IP addressing. Acquire knowledge of Application layer and Presentation layer paradigms and protocols and provide the mathematical background of routing protocols This course builds upon the topics covered in undergraduate Data Communication and Computer Network course, such as Physical Layer, Data link Layer and Transport Layer Services. After a brief review, these topics are studied in the context of Computer Networks.

Course Objectives

This course aims at training students to master the:

1. Gain core knowledge of Network layer routing protocols and IP addressing.
2. Study Session layer design issues, Transport layer services, and protocols.
3. Acquire knowledge of Application layer and Presentation layer paradigms and protocols.
4. Provide the mathematical background of routing protocols.
5. To develop some familiarity with current research problems and research methods in advance computer networks.

Course Outcomes

CO No's	Cos	Level
CO1	Student will be able to Understand the Network Layer, Transport Layer and Application Layer Principles.	L2
CO2	Student will be able Describe the QOS Techniques like Scheduling, Traffic shaping and Admission control	L2
CO3	Student will be able to Apply the various routing algorithms, Sub netting and Addressing of IP V4and IPV6.	L3
CO4	Analyze the various Network Layer, Transport Layer and Application Layer Principles in network design and implementation	L4

Lesson Plan

S. No	Unit	Topic	Teaching Aids	CO
1	I	Network Layer Services	BB	CO1
2		Packet Switching,	BB	CO1
3		Performance, provided transport layers	BB	CO1
4		Implementation connectionless services	BB	CO1
5		Implementation connection oriented services	BB	CO1
6		Comparison of virtual – circuit and datagram subnets	PPT	CO2
7		IPV4 Address	PPT	CO2
8		Forwarding of IP Packets	PPT	CO3
9		Internet Protocol	BB/PPT	CO2
10		ICMP v4, Mobile IP	BB	CO2
11	II	Distance Vector routing	BB	CO2
12		Link State Routing,	BB/PPT	CO2
13		Path Vector Routing	BB/PPT	CO2
14		Unicast Routing Protocol	BB/PPT	CO2
15		Internet Structure	BB	CO3
16		Routing Information Protocol	BB	CO2
17		Open Source Path First	BB	CO1
18		Border Gateway Protocol V4	BB/PPT	CO4

19		Broadcast routing,	BB	CO2
20		Multicasting routing	BB/PPT	CO2
21		Multicasting Basics	BB	CO1
22		Intradomain Multicast Protocols	BB	CO3
23		IGMP.	BB/PPT	CO3
24	III	IPv6 Protocol	BB/PPT	CO3
25		Transition from IPv4 to IPv6.	BB	CO4
26		Transport Layer Services	BB/PPT	CO1
27		connectionless versus connection oriented protocols	BB	CO3
28		Transport Layer Protocols: Simple Protocol	BB/PPT	CO3
29		Stop and Wait Protocol	BB/PPT	CO3
30		Go-Back-N Protocol	BB	CO3
31		Selective repeat Protocol	BB	CO3
32		Piggy Backing Protocol	BB	CO3
33		User datagram, Services, , Services	BB/PPT	CO3
34		User datagram	BB	CO4
35		Applications	BB	CO4
36		TCP services, TCP features	BB/PPT	CO1
37	Segment, A TCP connection ,	BB	CO3	
38	Flow control	BB/PPT	CO4	
39	Error control	BB	CO4	
40	Congestion control.	BB	CO4	
41	IV	SCTP services	BB	CO3
42		SCTP features	BB	CO3
43		packet format	BB/PPT	CO3
44		An SCTP association	BB	CO3
45		Flow control of SCTP	BB/PPT	CO2
46		Error control in SCTP	BB	CO3
47		QUALITY OF SERVICE: Flow characteristics	BB	CO3
48		QUALITY OF SERVICE: Flow control to improve	BB/PPT	CO3
49		QOS: Scheduling, Traffic Shaping	BB	CO3

50		QOS: Resource reservation, admission control.	BB	CO3
51	V	WWW and HTTP	BB/PPT	CO4
52		File Transfer Protocol (FTP)	BB	CO4
53		Telnet	BB/PPT	CO4
54		Domain name system,	BB	CO4
55		SNMP	BB/PPT	CO4
56		Multimedia data	BB	CO4
57		Multimedia in the Internet	BB/PPT	CO4

Evaluation Pattern

S. No	Components	Internal	External	Total
1	Theory	25	75	100
2	Engineering Graphics/Design/Drawing	25	75	100
3	Practical	20	30	50
4	Mini Project/Internship/Industrial Training/ Skill Development programmes/Research Project	-	50	50
5	Project Work – Part I	20	30	50
5	Project Work – Part II	60	90	150

Marks Range Theory (Max – 100)	Marks Range Lab (Max – 75)	Letter Grade	Level	Grade Point
≥ 90	≥ 67	O	Outstanding	10
≥80 to <90	≥60 to <67	S	Excellent	9
≥70 to <80	≥52 to <60	A	Very Good	8
≥60 to <70	≥45 to <52	B	Good	7
≥50 to <60	≥37 to <45	C	Fair	6
≥40 to <50	≥30 to <37	D	Satisfactory	5
<40	<30	F	Fail	0
			Absent	0

Timetable

Day/Time	09.00- 09.50	09.50- 10.40	11.00- 11.50	11.50- 12.40	01.40- 02.30	02.30- 03.20	03.20- 04.10	04.10- 05.00
Mon		ACN -B						
Tue	ACN-A				ACN -B			
Wed		ACN -A		ACN -B				
Thu						ACN -A		
Fri				ACN -A		ACN -B		
Sat	ACN -B		ACN -A		*****			

Unit wise Short Answer Questions

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 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 to 1.

Burst error: Means that 2 or more bits in the data unit have changed from 1 to 0 or from 0 to 1.

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 meant 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?

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 end-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 internet network 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 no manual configuration.
- Mobility and hosts: Hosts may move between networks without reconfiguring.
- Mobility of network: Possible for internet service providers to reconfigure customers addresses 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 statefull 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 internet network address (IP address), and the port address.

19. What are 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 keyboard 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 delivers 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.