B.E. (Computer Science Engineering) Sixth Semester (C.B.S.)

Computer Networks

P. Pages : 2 **NRT/KS/19/3493**

Time : Three Hours * 0 6 0 7 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Illustrate your answers whenever necessary with the help of neat sketches.
10. Use of non programmable calculator is permitted.

1. a) What are different network criteria ? Explain. **5**

b) Draw and explain OSI reference model. **8**

OR

2. a) Differentiate between OSI and TCP/IP model. **6**

b) How can computer networks be classified based on transmission technology and scales. **7**

3. a) List and explain different framing methods with example. **7**

b) Explain stop and wait ARQ protocol. **6**

OR

4. a) Differentiate between Go-back N ARQ and selective Repeat ARQ. **6**

b) What are the 3 kinds of frames in HDLC protocol ? Explain each one in detail. **7**

5. a) Discuss about pure ALOHA and slotted ALOHA. **7**

b) Explain Reservation and polling with suitable explain. **6**

OR

6. a) Write down the difference between Traditional Ethernet and fast Ethernet. **6**

b) Write short note on LCP and NCP. **7**

7.	a)	Describe shortest path algorithm.	**7**
	b)	Explain static and dynamic routing with suitable example.	**7**

OR

8.		Write short note on :	**14**
		i) Mobile routing basic algorithm.	
		ii) Distance vector routing.	
		iii) Flooding.	
9.	a)	Explain Leaky bucket algorithm and Token bucket algorithm with proper diagram.	**10**
	b)	Explain ARP and RARP protocol.	**4**

OR

10.	a)	Compare IPV_4 and IPV_6.	**4**
	b)	Explain IP and ICMP protocol.	**4**
	c)	Describe how chock packet algorithm helps in congestion control.	**6**
11.	a)	Draw and explain Bluetooth architecture.	**7**
	b)	Explain in brief DSL technology.	**6**

OR

12.		Write short note on **any three.**	**13**
		i) ATM layers.	**5**
		ii) SONET	**5**
		iii) Wireless LAN 802.11	**5**
		iv) VLAN	**3**

****

B.E. (Computer Science Engineering) Sixth Semester (C.B.S.)

Computer Networks

P. Pages : 2 **NIR/KW/18/3493**

Time : Three Hours * 1 2 6 3 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Discuss similarities and differences in TCP/IP and OSI model. Also explain OSI model. **9**

b) Explain different physical topologies that are used in the Network. **4**

OR

2. a) Explain different directions of data flow in network. Illustrate your answer with real time example. **7**

b) Identify the TCP/IP model layer that perform following action : **4**
i) Processes requests from hosts to make sure a connection is made to the appropriate port.
ii) Defines protocols used for addressing.
iii) Defines the types of connection established between hosts.
iv) Defines how hosts connects to network.

c) Define (a) Physical address (b) Port address (c) Logical address. **2**

3. a) Explain error detection and error correction. Also explain one error detection and one error correction method with example. **9**

b) Explain stop and wait ARQ protocol. Write procedure for it. **4**

OR

4. a) What is HDLC? Explain the different frames in HDLC protocol. **6**

b) Explain the concept of Go-Back-N-ARQ. **4**

c) Explain character stuffing with example. **3**

5. a) Explain point – to – point protocol along with its frame format. Also explain the different protocols in PPP. **9**

b) Differentiate between pure ALOHA and slotted ALOHA. **5**

OR

6. a) Explain difference between FDMA, TDMA, CDMA. **8**

b) Write short notes on : **6**
i) Traditional Ethernet
ii) Fast Ethernet

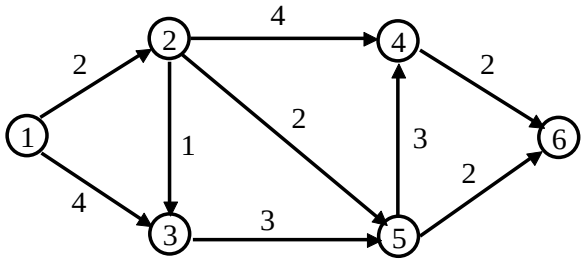
7. a) What routing technique is applied in flooding? How flooding affect network performance? **7**

b) Explain in detail Link State Routing. **6**

OR

8. a) What do you mean by routing? Differentiate between static and dynamic routing. **6**

b) Explain Dijikstra's shortest path algorithm. Explain with the help of following graph. **7**



9. a) Explain Address Resolution Protocol along with its header format? **7**

b) Write short notes on : **6**
i) Leaky Bucket algorithm
ii) Token Bucket algorithm

OR

10. a) List and explain $ICMP_V4$ messages along with its respective codes. **7**

b) What do you mean by congestion? Explain the different congestion control strategies. **6**

11. a) What do you mean by Quality of Services? Discuss techniques to improve QoS. **7**

b) Explain UDP header format. Also explain the services provided by transport layer. **7**

OR

12. Write short notes on **any four.** **14**

i) Bluetooth

ii) Wireless LAN : IEEE 802.11

iii) Sonet

iv) Cellular Telephony & Satellite network.

v) ISDN

****

B.E. (Computer Science Engineering) Sixth Semester (C.B.S.)

Computer Networks

P. Pages : 2 **NJR/KS/18/4548**

Time : Three Hours * 0 5 9 0 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) What are different types of service primitives? Explain with example? **5**

b) List two ways in which OSI Reference model and TCP/IP reference models are same. Now list two ways in which they differ. **9**

OR

2. a) Match the following to one or many layers of OSI model. **10**
- i) Communication directly with user application.
- ii) Route Determination.
- iii) Interface to Transmission Media.
- iv) Carrying frames between adjacent nodes.
- v) Process to process delivery.
- vi) Error correction and retransmission.
- vii) Mechanical, Electrical and Function interface.
- viii) Login and log out procedure.
- ix) Provide access to end user.
- x) Provide user services such as email and file transfer.

b) Differentiate between computer Networks and distributed system. **4**

3. a) Explain STOP and WAIT ARQ. **6**

b) What are the 3 kinds of frames in HDLC Protocol? Explain each one in detail. **7**

OR

4. a) A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is x^3+1. Show the actual bit string transmitted, suppose the third bit from the left is inverted during transmission. Show that this error is detected at the receiver's end. **8**

b) Explain sliding window protocol in detail. **5**

5. a) Explain CSMA/CD protocol. **7**

	b)	Discuss the channel allocation issue. How is it resolved.	**6**

OR

6.	a)	Differentiate between Pure ALOHA and slotted ALOHA.	**7**
	b)	Explain PPP and LCP.	**6**
7.	a)	Explain about distance vector routing.	**7**
	b)	Explain Dijkstra's shortest path algorithm.	**6**

OR

8.	a)	Explain and differentiate between static and Dynamic Routing.	**7**
	b)	What routing technique is applied in flooding? How flooding affect network performance?	**6**
9	a)	Write short notes on Internet Protocol (IP).	**6**
	b)	Explain Leaky bucket and Token bucket algorithm.	**8**

OR

10.	a)	Compare between IPv4 and IPv6.	**4**
	b)	What do you mean by congestion? How clock packet algorithm helps in congestion control?	**6**
	c)	Write short notes on ARP.	**4**
11.	a)	Write short notes on ATM Layers.	**5**
	b)	Discuss in brief different quality of service (QOS) parameters used in transport layer.	**5**
	c)	Write short notes on Bluetooth.	**3**

OR

12.	a)	Write short notes on wireless & ANS IEEE 802.11.	**6**
	b)	Draw and explain ISDN system Architecture.	**4**
	c)	Explain in brief satellite Network.	**3**

****

B.E. (Computer Science Engineering) Sixth Semester (C.B.S.)

Computer Networks

P. Pages : 2 **NRJ/KW/17/4548**

Time : Three Hours * 0 1 3 1 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Explain in detail about layers in OSI reference model. **6**

b) Write the difference between service and protocols. Also list and explain the different service primitives. **4**

c) Explain the design issues of OSI model layer. **3**

OR

2. a) State and explain the significance of studying topology. Explain any four topologies with their advantages and disadvantages. **7**

b) Explain the difference between connection oriented and connection less protocols. **6**

3. a) Explain the different error detection and correction techniques. **7**

b) What is framing? Explain the different types of framing with example? **6**

OR

4. a) Explain HDLC. What are the three frames of HDLC, explain with example. **6**

b) Explain the selective repeat ARQ protocol. **7**

5. Write a short note on following Multiple Access Protocols. **14**

i) Pure ALOHA

ii) Slotted ALOHA

iii) CSMA - CD

OR

6. a) Write a short note on following controlled Access Protocols. **8**

i) Token Ring

ii) Polling

b) Write down the difference between FDMA, TDMA, CDMA. **6**

7. a) Explain the significance of optimal Routing Number in Hierarchical Routing. **5**

b) What is the cause for count to infinity problems in distance vector routing algorithm. **3**

c) Explain shortest path algorithm for routing. **6**

OR

8. Explain following Routing protocols. **14**

i) Flooding

ii) Distance Vector Routing

iii) Link Stat Routing

9. Explain following congestion control algorithms. **13**

i) Choke packets

ii) Leaky Bucket

iii) Token Bucket

OR

10. a) Explain IPV_4 and IPV_6 header formats. **6**

b) Explain ARP and RARP protocols. **7**

11. a) Why does UDP exists? Explain UDP segment format. **5**

b) Why does maximum packet lifetime, T, have to large enough to ensure that not only the packet but also its acknowledgements have vanished. **4**

c) How the crash recovery is handled by transport layer. What are the difficulties in crash recovery process? **4**

OR

12. a) Explain the task perform by transport layer with respect to following. **5**

i) Addressing

ii) Connection Establishment

iii) Connection Release

b) Explain the fields in TCP header in detail. **4**

c) Write a short note on : **4**

i) Domain Name System

ii) Name Server

****

B.E.Sixth Semester (Computer Science Engineering) (C.B.S.)

Computer Networks

P. Pages : 2 **NKT/KS/17/7409**

Time : Three Hours * 0 6 8 1 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Compare OSI reference model with TCP/IP model. **6**

b) What is meant by layered protocol structure? List the various design issues in computer networks. **7**

OR

2. a) Explain with example the different service primitives. **7**

b) Differentiate between connection oriented services & connectionless services. **6**

3. a) Write short notes on CRC & solve the following : **9**
A bit stream 10011101 is transmitted using standard CRC method where the generator polynomial is x^3+1. Suppose the third bit from left is inverted during transmission show that the error is detected at receiver's end.

b) Write and explain the simplex stop & wait protocol. **5**

OR

4. a) Explain Go-Back-n protocol. What are the advantages of selective repeat protocol over Go-Back-n protocol. **7**

b) Write short notes on pure ALOHA & slotted ALOHA protocol. **7**

5. a) Explain: **7**
i) Traditional Ethernet ii) Fast Ethernet

b) Write short notes on CSMA protocols. **6**

OR

6.	a)	Explain point to point protocol & LCP.	**6**
	b)	Differentiate between FDMA, CDMA & TDMA.	**7**
7.	a)	With the help of an example explain link state routing.	**6**
	b)	Which type of routing technique can be applied in flooding? Explain how flooding can affect network performance.	**7**

OR

8.	a)	Differentiate between Adaptive & Non-Adaptive routing algorithms.	**7**
	b)	Write short notes on optimality principle in routing.	**6**
9.	a)	Explain Leaky bucket algorithm & Token bucket algorithm.	**7**
	b)	For connection establishment in transport layer write the process of three-way handshake protocol.	**6**

OR

10.	a)	Write short notes on $ICMP_{V4}$ messages.	**6**
	b)	Explain ARP, RARP with suitable example.	**7**
11.	a)	What is the importance to maintain quality of service in networking? What are the different techniques to improve Quality of service?	**7**
	b)	How TCP is different from UDP? Why both are required in transport layer?	**7**

OR

12. Write short on **any three.** **14**

a) Crash Recovery
b) Bluetooth
c) ISDN
d) ATM Layers.

****

B.E. Sixth Semester (Computer Science Engineering) (C.B.S.)

Computer Networks

P. Pages : 2 **KNT/KW/16/7409**

Time : Three Hours * 0 1 0 7 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.

1. a) Explain TCP/IP model in detail and compare it with OSI Reference model. **9**

b) Differentiate between computer Networks and distributed system. **3**

c) Draw the different WAN topologies. **2**

OR

2. a) Mention the different design issues of each layer of OSI model in detail. **10**

b) What are different types of service primitives? Explain with example. **4**

3. a) What is the significance of hamming distance? How is it used for error correction? Explain with example. **6**

b) What are the 3 kinds of frames in HDLC protocol? Explain each one in detail. **7**

OR

4. a) Explain in detail Go-Back-n protocol. **7**

b) How does simplex stop and wait protocol works? Write the algorithms for it. **6**

5. a) How is ring maintenance done in token rings? **6**

b) List the types of LCP packets in PPP protocol. **4**

c) Write the concept behind ALOHA Protocol. **3**

OR

6. a) What are CSMA protocols? Explain each one in detail. **5**

b) Explain difference between FDMA, TDMA, CDMA. **8**

7.	a)	Explain distance vector routing algorithm compare it with link state routing algorithm.	**8**
	b)	Explain shortest path algorithm.	**6**

OR

8.	a)	What is the optimality principle in routing? Explain with an example the hierarchical routing algorithm.	**8**
	b)	Explain the mobile routing basic algorithm.	**6**
9.	a)	How can congestion be defined? What are the factors that can cause it?	**5**
	b)	Explain Leaky bucket and token bucket algorithm.	**8**

OR

10.	a)	Write a short note on Internet protocol (IP)	**6**
	b)	Write a short note on ARP, RARP with suitable example.	**7**
11.	a)	Discuss in brief different quality of service (QOS) parameters used in transport layer.	**7**
	b)	Write the details of three-way handshake protocol for establishing connection in transport layer.	**6**

OR

12. Write short notes on **any three.**

i)	ISDN system architecture.	**4**
ii)	ATM layers.	**4**
iii)	Crash Recovery.	**4**
iv)	Warless LANS: IEEE 802.11	**5**

****

B.E. (Computer Science Engineering) Sixth Semester (C.B.S.)

Computer Networks

P. Pages : 2 **TKN/KS/16/7496**

Time : Three Hours * 0 8 3 1 * Max. Marks : 80

Notes : 1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions NO. 2.
3. Solve Question 3 OR Questions NO. 4.
4. Solve Question 5 OR Questions NO. 6.
5. Solve Question 7 OR Questions NO. 8.
6. Solve Question 9 OR Questions NO. 10.
7. Solve Question 11 OR Questions NO. 12.
8. Due credit will be given to neatness.
9. Assume suitable data whenever necessary.

1. a) Why do we need network? Explain advantages and disadvantages of layering in Computer Network. **7**

b) What is difference between a physical and logical topology ? Define different physical topologies that are used in the network. **7**

OR

2. a) List two ways in which the OSI reference model and the TCP/IP reference model are same. Now list two ways in which they differ. **4**

b) Match the following to one or more layers of the OSI Model. **10**

i) Communications directly with user's application program.
ii) Error Correction and retransmission.
iii) Mechanical, electrical and functional interface.
iv) Log-in and Log-out procedures.
v) Route determination.
vi) Provides access for the end user.
vii) Interface to transmission media.
viii) Process to process delivery.
ix) Provides user services such as e-mail and file transfer.
x) Carrying frames between adjacent nodes.

3. a) The following character encoding is used. **9**

A:01000111 B:11100011
FLAG:01111110 ESC:11100000

Show the bit sequence transmitted (in binary) for the above four character frame: ABESC FLAG with each of the following framing methods.

i) Character count
ii) Flag bytes with byte stuffing
iii) Starting and ending flag bytes, with bit stuffing

b) Explain Go-Back-N ARQ Protocol. **4**

OR

4. a) A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is x^3+1. Show the actual bit string transmitted. Suppose the third bit from the left is inverted during transmission. Show that this error is detected at the receiver's end. **8**

b) Explain selective repeat ARQ. **5**

5. a) What do you mean by PPP? What is the need of PPP Also explain the services provided by PPP? **4**

b) A large population of ALOHA users manages to generate 50 requests/sec, including both originals and retransmissions. Time is slotted in units of 40m sec. **9**

i) What is the chance of success on the first attempt ?
ii) What is the probability of exactly K collisions and then a success ?
iii) What is the expected number of transmission attempts needed ?

OR

6. a) Explain fast Ethernet and Gigabit Ethernet. Also explain the difference. **6**

b) How CDMA allow each station to transmit over the entire frequency spectrum all the time? Explain with example. **7**

7. a) What routing technique is applied in flooding? How flooding affect network performance? **7**

b) Explain distance vector routing. **6**

OR

8. a) Explain Static Vs dynamic routing. **7**

b) Explain link state routing. **6**

9. a) Explain Token Bucket & Leaky Bucket Algorithm stating difference between them. **7**

b) Compare and contrast IP_{V4} & IP_{V6}. **6**

OR

10. a) List and explain $ICMP_{V4}$ messages along with its respective codes. **7**

b) What is congestion ? How choke packet algorithm helps congestion control ? **6**

11. a) What do you mean by Quality of Services ? Discuss technique to improve QoS. **7**

b) Why connection oriented and connection-less transport protocols are needed ? Explain TCP. **7**

OR

12. Write note on:

i) ISDN **4**
ii) IEEE 802.11. **4**
iii) Bluetooth. **3**
iv) Cellular telephony & satellite network. **3**

****

NTK/KW/15/7496

Faculty of Engineering and Technology

Sixth Semester B.E. (Comp. Sci. Engg.) C.B.S. Examination

COMPUTER NETWORK

Time : Three Hours] [Maximum Marks : 80

INSTRUCTIONS TO CANDIDATES

(1) All questions carry marks as indicated.

(2) Solve Question No. **1 OR** Question No. **2.**

(3) Solve Question No. **3 OR** Question No. **4.**

(4) Solve Question No. **5 OR** Question No. **6.**

(5) Solve Question No. **7 OR** Question No. **8.**

(6) Solve Question No. **9 OR** Question No. **10.**

(7) Solve Question No. **11 OR** Question No. **12.**

(8) Due credit will be given to neatness and adequate dimensions.

(9) Illustrate your answers wherever necessary with the help of neat sketches.

1. (a) Differentiate between TCP/IP and ISO OSI Reference model. 7

(b) How layer n interacts with n + 1 with service provided by each layer ? 5

(c) List the various LAN topologies. 2

OR

2. (a) What are different types of service primitives ? Explain with example. 5

(b) Differentiate between computer network and distributed system. 6

(c) What are the various categories of Network ? 3

3. (a) Explain Stop and Wait ARQ Protocol. 6

(b) How does Simplex Stop and Wait Protocol work ? Write the algorithm for it. 7

OR

4. (a) Explain sliding window protocol in detail. 6

(b) What are the 3 kinds of frames in HDLC protocol ? Explain each one in detail. 7

5. (a) Differentiate between Pure ALOHA and Slotted ALOHA. 6

(b) List the types of LCP packets in PPP protocol. 4

(c) What is CSMA/CD protocols ? 3

OR

6. (a) Explain difference between FDMA, TDMA, CDMA. 7

(b) Write short notes on :

(i) Traditional Ethernet

(ii) Fast Ethernet. 6

7. (a) Explain and differentiate between Adaptive and Non-Adaptive Routing Algorithm. 8

(b) What is the optimality principle in Routing ? 5

OR

8. (a) Explain Dijkstra's shortest path Algorithm with suitable example. 7

(b) What routing technique is applied in flooding ? How flooding affect network performance ? 6

9. (a) What do you mean by congestion ? How choke packet algorithm helps in congestion control ? 7

(b) Write short notes on :

(i) Leaky Bucket Algorithm

(ii) Token Bucket Algorithm. 7

OR

10. (a) Write short notes on :

(i) ARP

(ii) RARP. 6

(b) Explain the Internet Protocol (IP). 4

(c) Compare between IPv4 and IPv6. 4

11. (a) Discuss in brief different Quality Of Service (QOS) parameters used in transport layer. 7

(b) How TCP is different from UDP ? Why both are required in transport layer ? 6

OR

12. Write short notes on (any **three**) :

(i) ISDN System Architecture

(ii) ATM Layers

(iii) Crash Recovery

(iv) Wireless LANS ; IEE 802.11 13

PMM/KS/15/7105

Faculty of Engineering & Technology

Sixth Semester B.E. (Computer Science Engineering)

(C.B.S.) Examination

COMPUTER NETWORKS

Time—Three Hours] [Maximum Marks—80

INSTRUCTIONS TO CANDIDATES

(1) All questions carry marks as indicated.

(2) Solve Question No. **1** OR Question No. **2.**

(3) Solve Question No. **3** OR Question No. **4.**

(4) Solve Question No. **5** OR Question No. **6.**

(5) Solve Question No. **7** OR Question No. **8.**

(6) Solve Question No. **9** OR Question No. **10.**

(7) Solve Question No. **11** OR Question No. **12.**

(8) Due credit will be given to neatness and adequate dimensions.

(9) Illustrate your answers wherever necessary with the help of neat sketches.

1. (a) Identify the TCP/IP model layer that perform following action :

(i) Processes requests from hosts to make sure a connection is made to the appropriate port.

(ii) Defines the types of connection established between hosts.

(iii) Defines protocols used for addressing.

(iv) Defines how host connects to network. 4

(b) Discuss similarities and differences in TCP/IP and OSI model. 9

OR

2. (a) What are different directions of data flow in network ? Explain each and provide a real time example for each. 7

(b) Explain various categories of Network. 6

3. (a) What is error detection and error correction ? Discuss two methods of error correction. 10

(b) Explain stop and wait ARQ protocol. 4

OR

4. (a) What do you mean by framing ? Discuss framing methods. 8

(b) Explain selective repeat ARQ. 6

5. (a) Discuss the channel allocation issue. How is it resolved ? 7

(b) Write notes on :

(i) Traditional Ethernet

(ii) Fast Ethernet. 6

OR

6. (a) Explain point to point protocol and LCP. 7

(b) Explain pure ALOHA and slotted ALOHA. 6

7. (a) What do you mean by routing ? Discuss static vs. dynamic routing. 7

(b) Explain what is distance vector routing ? 6

OR

8. (a) What routing technique is applied in flooding ? How flooding affect network performance ? 7

(b) Explain what is link state routing ? 6

9. (a) Explain the protocol used for mapping logical address to physical address. 7

(B) Compare and contrast IPv_4 vs IPv_6. 7

OR

10. (a) What do you mean by congestion ? How choke packet algorithm helps congestion control ? 7

(b) Write notes on :

(i) Leaky bucket algorithm

(ii) Token bucket algorithm. 7

11. (a) How TCP is different from UDP ? Why both are required in transport layer ? 7

(b) What do you mean by Quality of Services ? Discuss technique to improve QoS. 6

OR

12. (a) What is ISDN ? Explain ISDN services. 7

(b) Write notes on :

(i) IEEE 802.11

(ii) Bluetooth. 6