



COLLEGE OF ENGINEERING

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B.E. ECE

SUB.CODE : CS1302

BRANCH / YEAR / SEM: ECE / III / VI

SUB.NAME : COMPUTER NETWORKS

UNIT – I DATA COMMUNICATION

PART A

1. What is mean by data communication?
2. What are the three criteria necessary for an effective and efficient network?
3. What are the three fundamental characteristics determine the effectiveness of the data communication system?
4. What are the advantages of distributed processing?
5. Why are protocols needed?
6. Why are standards needed?
7. For n devices in a network, what is the number of cable links required for a mesh and ring topology?
8. What is the difference between a passive and an active hub?
9. Distinguish between peer-to-peer relationship and a primary-secondary relationship.
10. Assume 6 devices are arranged in a mesh topology. How many cables are needed? How many ports are needed for each device?
11. Group the OSI layers by function.
12. What are header and trailers and how do they get added and removed?
13. The transport layer creates a communication between the source and destination. What are the three events involved in a connection?
14. What is the DC component?
15. How does NRZ-L differ from NRZ-I?
16. Using HDB3, encode the bit stream 10000000000100. Assume the number of 1s so far is odd and the first 1 is positive.
17. What are the functions of a DTE? What are the functions of a DCE?
18. What does the electrical specification of EIA-232 describe?
19. Discuss the mode for propagating light along optical channels.

20. What is refraction?
21. List out the advantages and drawbacks of bus topology.
22. List out the advantages and drawbacks of ring topology.
23. Why star topology is commonly preferred?
24. Is there any relationship between transmission media and topology?

PART B

1. What are the functions of OSI layers? Discuss. (16)
2. a. Explain the types of line coding with neat diagrams. (8)
b. Explain about RS-232 interface. (8)
3. Explain in detail about the types of topologies. (16)
4. Explain detail about the transmission media for data transmission. (16)
5. a. i. What is a protocol? List the three key elements of a protocol. (4)
ii. With relevant examples differentiate between simplex, half duplex and full duplex communication. (4)
b. i. A sine wave complete one cycle in 25 microseconds. What is its frequency? Express the frequency in KHz. (4)
ii. A digital signal has a bit interval of 40 microseconds. What is the bit rate? Express the bit rate in Kbps. (4)
6. What is the difference between a protocol and a service interface? Explain in terms of a ISO seven layer model. (16)
7. a. List the four properties by which transmission media can differ (4)
b. Three packet switching networks each contain n nodes. The networks has a star topology with a central switch, a ring respectively and a third is fully interconnected with a wire form every node to every other node. What are the best, average and worst case transmission paths in hops? (12)
8. a. Describe the key elements of protocols and the standards. (8)
b. Explain in detail the data transmission in OSI reference model. (8)

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UNIT-II DATA LINK LAYER

PART A

1. What are the responsibilities of data link layer?
2. Mention the types of errors.
3. Define the following terms.
4. What is redundancy?
5. List out the available detection methods.
6. Write short notes on VRC.
7. Write short notes on LRC.
8. Write short notes on CRC.
9. Write short notes on CRC generator.
10. Write short notes on CRC checker.
11. Give the essential properties for polynomial.
12. Define checksum.
13. What are the steps followed in checksum generator?
14. List out the steps followed in checksum checker side.
15. Write short notes on error correction.
16. Mention the types of error correcting methods.
17. What is the purpose of hamming code?
18. Define flow control.
19. What is a buffer?
20. Mention the categories of flow control.

PART B

1. a. Define CRC. Explain CRC generator & CRC checks in detail with one example (10)
 b. Explain in detail about error correction using Hamming code. (6)
2. Explain HDLC and explain it in detail. (16)
3. a. Given a 10 bit sequence 1010011110 and a divisor of 1011 find the CRC. Check the answer (10)
 b. Bit stuff the following data (6)
 i. 0001111110111110011110011111001
 ii. 0001111111111111111111111111111111110011111001
4. What is IEEE 802.3? What are the types of Ethernet? Discuss. (16)

5. Draw the sender and receiver window for a system using Go Back N ARQ and selective repeat ARQ, given the following (16)
- a. Frame 0 is sent, frame 0 is acknowledged
 - b. Frames 1 and 2 are sent, frames 1 and 2 are acknowledged
 - c. Frames 3,4 and 5 are sent; frame 4 is acknowledged; timer for frame 5 expired. Frames 5,6 and 7 are sent; frames 4 through 7 are acknowledged
6. Discuss Token Bus & Token Ring networks in detail. (16)
7. Define FDDI & its needs in detail. (16)
8. a. What is SONET? (2)
- b. Name some layers of SONET & its functions. (6)
 - c. Discuss SONET frame in detail with a neat diagram. (8)
9. a. Define bridges? (2)
- b. Difference between bridges and repeaters. (4)
 - c. Explain the loop problems solved by bridges. (10)

UNIT III NETWORK LAYER

PART A

1. What are the network support layers and the user support layers?
2. With a neat diagram explain the relationship of IEEE Project to the OSI model?
3. What are the functions of LLC?
4. What are the functions of MAC?
5. What is protocol data unit?
6. What are headers and trailers and how do they get added and removed?
7. What are the responsibilities of network layer?
8. What is a virtual circuit?
9. What are data grams?
10. What are the two types of implementation formats in virtual circuits?
11. What is meant by switched virtual circuit?
12. What is meant by Permanent virtual circuit?
13. Define Routers.
14. What is meant by hop count?
15. How can the routing be classified?

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16. What is time-to-live or packet lifetime?
17. What is meant by router?
18. Write the keys for understanding the distance vector routing.
19. Write the keys for understanding the link state routing.
20. How the packet cost referred in distance vector and link state routing?

PART B

1. What is an internet? Imagine an organization where internet is needed & discuss it in detail with neat diagram. (16)
2. Explain in detail about datagram approach and compare with circuit switching. (16)
3. a. Explain Routing Table and Routing Module (8)
b. A company is granted the site address 201.70.64.0. The company needs 6 subnets. Design the subnets. (8)
4. a. How is the looping problem solved by switches and by routers? How do switches/routers handle link failure? (8)
b. Explain the IP addressing (8)
5. a. Change the following IP address from dotted decimal notation to binary notation. (2)
 - i. 114.34.2.8
 - ii. 129.14.6.8
b. Change the following IP address from binary notation to dotted decimal notation. (2)
 - i. 01111111 11110000 01100111 01111101
 - ii. 11110111 11110011 10000111 11011101
c. Find the net and host id of the IP addresses (2)
 - i. 241.34.2.8
 - ii. 11101111 11110111 11000111 00011101
d. In a class C subnet, find out the network address (2)
 - i. IP address: 182.44.82.1

6 Mask: 255.255.255.192e. What is the maximum number of subnets in class A/B using the following masks. (8)

i. 255.255.192.0

ii. 255.192.0.0

iii.255.255.0.0

iv. 255.255.224.0

UNIT IV TRANSPORT LAYER

PART A

1. What is function of transport layer?
2. What are the duties of the transport layer?
3. What is the difference between network layer delivery and the transport layer delivery?
4. What are the four aspects related to the reliable delivery of data?
5. What is meant by segment?
6. What is meant by segmentation?
7. What is meant by Concatenation?
8. What are the types of multiplexing?
9. What are the two possible transport services?
10. The transport layer creates the connection between source and destination. What are the three events involved in the connection?
11. What is meant by congestion?
12. Why the congestion occurs in network?
13. What is meant by quality of service?
14. What are the two categories of QoS attributes?
15. List out the user related attributes?
16. What are the networks related attributes?
17. What is the difference between service point address, logical address and physical address?
18. What are the rules of non boundary-level masking?
19. Define Gateway.
20. What is LSP?

PART B

1. A client uses UDP to send data to a server. The data are 16 bytes. Calculate the efficiency of the transmission at the UDP Level (16)
2. Explain the concepts behind in the Silly Window Syndrome. (16)

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3. a. Draw and explain in detail about the State Transmission diagram of TCP (8)
b. Explain in detail about congestion avoidance in TCP (8)
- 4 . a. Define UDP. (2)
b. Explain the segment format of UDP (6)
c. Explain in detail about congestion control (8)
5. a. Explain the three phases of TCP (8)
b. Explain the segment format of TCP (8)
6. Explain in detail about various techniques to improve Quos (16)
7. Explain in detail about integrated services (16)

UNIT – V APPLICATION LAYER

PART A

1. What is the purpose of Domain Name System?
2. Discuss the three main division of the domain name space.
3. Discuss the TCP connections needed in FTP.
4. Discuss the basic model of FTP.
5. What is the function of SMTP?
6. What is the difference between a user agent (UA) and a mail transfer agent? (MTA)?
7. How does MIME enhance SMTP?
8. Why is an application such as POP needed for electronic messaging?
9. Give the format of HTTP request message.
10. Give the format of HTTP response message.
11. Write down the three types of WWW documents.
12. What is the purpose of HTML?
13. Define CGI.
14. Name four factors needed for a secure network.
15. How is a secret key different from public key?
16. What is a digital signature?
17. What are the advantages & disadvantages of public key encryption?
18. What are the advantages & disadvantages of secret key encryption?
19. Define permutation.
20. Define substitutional & transpositional encryption.

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PART B

1. Define DNS and explain the major sections of DNS in detail? (16)
2. With a neat diagram explain the basic model of FTP? (16)
3. What is public key cryptography and explain RSA in detail with one example.(16)
4. Explain various types of substitution techniques. (16)
5. a. SMTP, FTP and HTTP are protocols to transfer messages from one point to another.
Compare and contrast their use (8)
- b. Write short notes on HTTP Request and Response messages (8)
6. Explain in detail about SMTP. (16)
7. a. Use the following encryption algorithm to encrypt the message,
 - a. Replace each character with its ASCII code
 - b. Add a 0 bit at the left to make each character 8 bits long. Swap the first 4 bits with the last 4 bits.
 - d. Replace every 4 bits with its hexadecimal equivalentWhat is the key in this method (8)
- b. Using the RSA algorithm, encrypt and decrypt the message ‘BE’ with key pairs(3,15) and (5,15). (8)