**DEPARTMENT OF COMPUTER SCIENCEAND ENGINEERING**

**QUESTION BANK**

**Subcode / Subject: CS1302 / Computer Networks Year/Sem : V**

**UNIT I DATA COMMUNICATIONS**

**PART A ( 2 Marks)**

**1. Define Data communication**

**2. List out the characteristics of data communication**

**3. What are the components of data communication?**

**4. What are the various forms of data?**

**5. What are the various types of data flow?**

**6. Define networks**

**7. Define Distributed Systems**

**8. Define Distributed Processing**

**9. Define Transit time and Response time**

**10. Define Topology**

**11. What are the types of topology available and the number of links required toconnect n machines?**

**12. Define Protocol.**

**13. Why are protocols needed?**

**14. What are the key elements of a protocol?**

**15. Why are standards needed?**

**16. Who are the standard committee?**

**17. Define OSI model**

**18. What are the seven layers of OSI Model?**

**19. Define Network architecture**

**20. Define Protocol stack**

**21. Define Transmission medium**

**22. Define Guided Media**

**23. Define Unguided media**

**24. Define Line coding**

**25. What is the relationship between data element and signal element?**

**26. Define data rate and signal rate**

**27. Define Bandwidth**

**28. What are the line coding scheme available?**

**29. How does NRZ – L differ from NRZ – I ?**

**30. Define Modem**

**31. What are the standards available in modem?**

**32. Discuss the mode for propagating light along optical channels**

**33. What is the difference between a passive and an active hub?**

**34. What are the three criteria necessary for effective and efficient networks?**

 **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)**

**5. 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 astar 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)**

 **UNIT II DATA LINK LAYER**

 **PART A ( 2 Marks)**

**1. List out the functions of data link control.**

**2. Define errors.**

**3. List out the types of error.**

**4. Define error detection.**

**5. Define error correction**

**.6. List out error correction mechanism.**

**7. Define Block coding.**

**8. Draw the process of error detection in block coding ?**

**9. Define hamming distance.**

**10. Find the Hamming distance**

**11. Define simple parity check code.**

**12. Define flow control.**

**13. Define error control.**

**14. Define ARQ**

**15. Define Piggybacking**

**16. Define sliding window**

**17. Define HDLC and its transfer mode.**

**18. List out the frames in HDLC and its purpose.**

**19. Draw the neat diagrams of frame format of various frames of HDLC.**

**20. List out the control field for S frames.**

**21. Define LAN & List out the technologies.**

**22. What are the two sublayers of Data Link layer and define its functionalities.**

**23. Draw the frame format of Ethernet.**

**24. List out the Ethernet types.**

**25. Define CSMA /CD26. Define NAV.**

**27. Define the frame format of IEEE 802.5**

**28. Define FDDI.**

**29. What are the devices used in SONET.**

**30. What are the four SONET layers?**

 **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. 00011111111111111111111111111111111110011111001**

**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 repeatARQ, 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 expires**

 **d. 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 ( 2 Marks)**

**1. Define internetworking?**

**2. Distinguish between networking and internetworking.**

**3. What are the devices used for internetworking?**

**4. What do you meant by switching and mention its types.**

**5. What is the difference between packet switching and circuit switching?**

**6. Mention any two advantages of subnetting.**

**7. What are the approaches in packet switching?**

**8. What are the two main elements of distance vector routing?**

**9. What is the role of packet lifetime?**

**10. Give the fields available in IP address.**

**11. What is meant by classful addressing?**

**12. Define Unicast, multicast and broadcast.**

**13. Compare Ethernet address with IP address.**

**14. What are the functions of IP Protocol?**

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

**16. Distinguish between bridges and routers.**

 **PART B**

**1. What is an internet? Imagine an organization where internet is needed & discussit in detail with aneat 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.Designthe subnets. (8)**

**4. a. How is the looping problem solved by switches and by routers. How doswitches/routers**

 **handlelink failure? (8)**

 **b. Explain the IP addressing. (8)**

**5. a. Change the following IP address from dotted decimal notation to binarynotation. (2)i.**

 **114.34.2.8 ii. 129.14.6.8**

 **b. Change the following IP address from binary notation to dotted decimalnotation. (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: 182.44.82.16**

 **Mask: 255.255.255.192**

**e. 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 ( 2 Marks)**

**1. What are the services provided by the transport layer?**

**2. Define reliability and its aspects.**

**3. Define multiplexing.**

**4. Define RTT.**

**5. What is the purpose of Urgent pointer in the TCP header?**

**6. What is meant by slow start in TCP?**

**7. Define socket.**

**8. Define datagram socket.**

**9. Draw a neat diagram of a transport layer segment.**

**10. Differentiate between TCP and UDP.**

**11. Define QoS.**

**12. What are the steps in call set up process?**

**13. Define integrated services.**

**14. Name some tuples which is used to identify a TCP socket.**

**15. What do you meant by congestion?**

**16. What are the types of congestion control? Explain.**

**17. Define flow control?**

 **PART B**

**1. A client uses UDP to send data to a server. The data are 16 bytes. Calculatethe efficiency of thetransmission at the UDP Level (16)**

**2. Explain the concepts behind in the Silly Window Syndrome. (16)**

**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 Qos (16)**

**7. Explain in detail about integrated services (16)**

 **UNIT VAPPLICATION LAYER**

 **PART A ( 2 Marks)**

**1. Define DNS.**

**2. Name some generic domain labels.**

**3. What are the four main properties of HTTP?**

**4. Describe why HTTP is designed as a stateless protocol.**

**5. Define virtual terminal.**

**6. What do you mean by active web pages?**

**7. What are the transmission modes of FTP?**

**8. Compare HTTP and FTP.**

**9. What are the types of source records?**

**10. What do you meant by FTP?**

**11. Draw the basic model of FTP.**

**12. What are the things supported by SMTP?**

**13. Draw the General format of HTTP request messages.**

**14. What are the categories of web documents and specify the languages which it isused for eachdocument?**

**15. What are the things define by URL?**

**16. What are the aspects of information security?**

**17. Name some security services.**

**18. What are the types of security attacks?**

**19. Define AES.**

**20. Write the steps for an RSA.**

**21. What is the relationship between CGI & dynamic documents?**

**22. What is an active document?**

**23. What is conventional encryption?**

**24. Define the structure of data in FTP.**

**25. Define Catching in DNS.**

 **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,**

 **i. Replace each character with it’s ASCII code**

 **ii. Add a 0 bit at the left to make each character 8 bits long**

 **iii. Swap the first 4 bits with the last 4 bits.**

 **iv. Replace every 4 bits with its hexadecimal equivalent .What 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)**