

R18

Code No: 155EA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, March - 2024

ADVANCED COMPUTER NETWORKS

(Computer Science and Engineering - Networks)

Time: 3 Hours

Max. Marks: 75

- Note:** i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

- 1.a) What do you mean by access network? [2]
- b) What is the difference between delay and latency? [3]
- c) What are the functions of a switch? [2]
- d) What do you mean by burst error? List two techniques to identify them. [3]
- e) What is full duplex communication? [2]
- f) How token ring handles collisions? [3]
- g) Which transport layer protocol is used for real time multimedia? [2]
- h) Consider the data transfer using TCP over a 1Gbps link. Assuming that the Maximum Segment Lifetime (MSL) is set to 60sec. What are the the minimum number of bits required for the sequence number field of the header, to prevent the sequence number space from wrapping around during the MSL? [3]
- i) List any two web servers. [2]
- j) How is DNS organized? [3]

PART – B

(50 Marks)

- 2.a) Examine the differences between the network edge and the network core. How do these components work together to ensure efficient data transmission in a network?
- b) What are network standards and why do we need them? List commonly used standards at each layer during data communication. [6+4]

OR

- 3.a) Explain different types of physical media used in networking. What characteristics impact the choice physical media and how?
- b) How does IP addressing facilitate the routing of data across diverse networks? [6+4]
- 4.a) Assume the information portion of a packet contains 10 bytes consisting of the 8-bit unsigned binary ASCII representation of string "Networking." Compute the Internet checksum for this data.
- b) What is MAC? Explain CSMA/CA protocol. [5+5]

OR

- 5.a) Explain the Ethernet standard for LAN.
b) Discuss the concept of link virtualization and its role in network design. How does link virtualization contribute to scalability and flexibility in modern networks? [5+5]

- 6.a) How does Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA) work in wireless networks?
b) Evaluate the strengths and weaknesses of BGP in the context of inter-domain routing. How does BGP ensure policy-based routing and support for multiple paths between domains? [5+5]

OR

- 7.a) Discuss the limitations and potential solutions for scalability issues in Mobile IP.
b) Assume input burst data at a rate of 33 Mbps for 5sec. After a halt of 4sec, data flows at the rate of 15Mbps for 5sec. For a Leaky bucket algorithm, what should be the rate of flow of output data provided that bucket functions for 8sec? [5+5]

- 8.a) Host A and B are communicating over a TCP connection, and Host B has already received from A all bytes up through byte 126. Suppose Host A then sends two segments to Host B back-to-back. The first and second segments contain 80 and 40 bytes of data, respectively. In the first segment, the sequence number is 127, the source port number is 302, and the destination port number is 80. Host B sends an acknowledgment whenever it receives a segment from Host A.
i) In the second segment sent from Host A to B, what are the sequence number, source port number, and destination port number?
ii) If the first segment arrives before the second segment, in the acknowledgment of the first arriving segment, what is the acknowledgment number, the source port number, and the destination port number?
b) Differentiate between TCP and UDP protocols. [6+4]

OR

- 9.a) How is congestion handled in transport layer? Explain.
b) A UDP receiver computes the Internet checksum for the received UDP segment and finds that it matches the value carried in the checksum field. Can the receiver be absolutely certain that no bit errors have occurred? Explain. [6+4]

- 10.a) Describe the request and response messages in HTTP protocol.
b) How does SMTP protocol function in Email application? [6+4]

OR

- 11.a) Explain the advantages and disadvantages of Peer-to-Peer (P2P) file sharing networks. How do they differ from centralized file sharing systems?
b) Write a socket program to send a message using TCP. [6+4]

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