

SEMESTER END EXAMINATIONS – AUGUST 2024

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| Program | : B.E :- Computer Science and Engineering | Semester | : IV |
| Course Name | : Data Communication and Networking | Max. Marks | : 100 |
| Course Code | : CS44 | Duration | : 3 Hrs |

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

- Explain the components of data communication systems with a neat diagram. CO1 (07)
 - Match the following to one or more layers of the TCP/IP protocol suite: CO1 (05)
 - Route determination
 - Connection to transmission medium
 - Providing services to end user
 - Creating user datagrams
 - Responsibility of handling frames between adjacent nodes.
 - Illustrate Recursive and Iterative DNS mapping process. CO1 (08)
- Describe the need for web caching. CO1 (06)
 - With a neat sketch, explain how SMTP operates when A send mail to B, where the mail server of A and B are different. Show the sequence of events. CO1 (08)
 - Illustrate the file distribution time for client-server architecture. CO1 (06)

UNIT - II

- Discuss the Go-Back-N Protocol along with the sequence diagram. CO2 (08)
 - Justify the statement: TCP congestion control is referred to as Additive-increase, multiplicative-decrease congestion control. CO2 (06)
 - Discuss the UDP segment structure. CO2 (06)
- Explain the 3-way handshake and closing a TCP connection CO2 (06)
 - Illustrate flow control and error control at the transport layer. CO2 (06)
 - Suppose the measured RTT values are 106 ms and 120 ms. CO2 (08)
 - Compute estimated RTT after each of these sample RTT values is obtained using the value of $\alpha = 0.125$ and assuming that the value of estimated RTT was 100 ms just before the first of these two samples was obtained.
 - Compute also DevRTT after each sample is obtained assuming the value of $\beta = 0.25$ and assuming the value of DevRTT = 5 ms just before the first of these two samples was obtained.
 - Compute the TCP time-out interval after each of these samples was obtained.

UNIT - III

- Name the different classes of addressing. Given an IP address, determine its class: CO3 (04)
 - 192.68.1.18
 - 48.8.1.1
 - 250.16.1.1
 - 122.1.1.1
 - Explain the need for CIDR in detail. CO3 (08)
 - What is fragmentation? Explain the fragmentation fields in IPV4 header format. CO3 (08)

6. a) An address in a block is given as 73.22.17.25. Find the number of addresses in the block, the first address and the last address. CO3 (06)
b) Illustrate Hop Count in RIP with a suitable example. CO3 (08)
c) Explain the Count-to-infinity problem and discuss the solution. CO3 (06)

UNIT- IV

7. a) Illustrate CSM/CD in detail. CO4 (08)
b) Justify the need for Byte stuffing and unstuffing. CO4 (06)
c) Find the codeword for the data word: 1001 and generator: x^3+x+1 . CO4 (06)
8. a) Delineate the process of error detection in block coding. CO4 (06)
b) Discuss the CRC encoder and decoder. CO4 (08)
c) Illustrate controlled access protocols with suitable diagrams. CO4 (06)

UNIT - V

9. a) Identify the type of the following destination address in standard ethernet: CO5 (04)
i. 4A:30:10:21:10:1A
ii. 47:20:1B:2E:5C:EF
iii. FF:FF:FF:FF:FF:FF
iv. 5D:20:00:44:6E:FE.
b) Explain in detail MAC Layer of IEEE 802.11 standard. CO5 (08)
c) Illustrate PCM (Pulse Code Modulation) with a neat diagram. CO5 (08)
10. a) Assume we need to download text documents at the rate of 100 pages per minute. (Assume: A page is an average of 24 lines with 80 characters in each line). CO5 (04)
i. What is the required bit rate of the channel?
ii. What is the required bit length of the channel?
b) Identify the three causes of impairments during data transmission. Explain in detail. CO5 (08)
c) Explain any two Digital-to-analog conversion techniques in detail. CO5 (08)
