Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **14CS2007** | **Duration :** | **3hrs** |
| **Sub. Name :** | **COMPUTER NETWORKS** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Write in detail the Protocol layers of internet stack along with their service models and narrate how the layers of the TCP/IP protocol-suite correlate to any application of your choice. | CO1 | 14 |
| b. | Compare and constrast the functions and working of circuit switched networks and packet switched networks. | CO1 | 6 |
| **(OR)** | | | | |
| 2. | a. | Consider a highway that has a tollbooth every 100km.You can think of the highway segments between tollbooths as links and the tollbooth as routers. Suppose that cars travel on the highway at a rate of 100km/hr, suppose next that 10 cars travelling together as a caravan follow each other in a fixed order. You can think of each car as a bit and the caravan as a packet. Also suppose that each tollbooth services a car at a rate of one car per 12 seconds and that it is late at night so that the caravan's cars are the only cars on the highway. Finally suppose that whenever the first car of the caravan arrives a tollbooth it waits at the entrance until the other nine cars have arrived and lined up behind it. How long until caravan is lined up before 2nd toll booth? | CO1 | 10 |
| b. | 1. Consider sending a packet from a sending host to a receiving host over a fixed route. List the delay components in the end-to-end delay. Which of these delays are constant and which are variable? | CO1 | 10 |
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| 3. | a. | Explain in detail the persistent and non-persistent HTTP connection and give the importance of cookies and web caching. | CO2 | 12 |
| b. | Explain the SMTP protocol and list the protocols used for sending and receiving emails. | CO2 | 8 |
| **(OR)** | | | | |
| 4. | a. | Write a detailed note with suitable diagrams on DNS working along with its resource record and message format. | CO2 | 12 |
| b. | Write a detailed note on FTP protocol. | CO2 | 8 |
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| 5. | a. | Explain the principles of congestion control by illustrating the following scenarios and justify their throughput for each condition  Scenario 1: Two sender, a router with infinite buffers  Scenario 2 : Two sender and a router with finite buffer  Scenario 3: Four senders, routers with finite buffers and multiple paths | CO3 | 10 |
| b. | Explain with necessary figures, the concept of rdt 3.0. | CO2 | 10 |
| **(OR)** | | | | |
| 6. | a. | Describe the TCP Segment header format with neat sketch. | CO2 | 10 |
| b. | With neat diagram, discuss the TCP connection establishment process. | CO3 | 10 |
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| 7. | a. | For the given figure, find the shortest path using Dijistra’s algorithm. | CO3 | 10 |
| b. | Compare and contrast the IPV4 and IPV6 datagram format. | CO2 | 10 |
| **(OR)** | | | | |
| 8. | a. | Consider the scenario below in which three hosts, with private IP addresses 10.0.1.11, 10.0.1.17, 10.0.1.24 are in a local network behind a NATted router. The router’s interface on the LAN side has IP address 10.0.1.28, while the router’s address on the Internet side has IP address 135.122.201.205. Step 1 to 4 shows the host with IP address 10.0.1.11 sending an IP datagram destined to host 128.119.174.190 and gets a reply from it.  network  List down the source and destination IP address from step number 1 to 4. Also fill the appropriate entries in the router's NAT table. | CO3 | 10 |
|  | b. | Explain any two Error detection and correction techniques. Perform Cyclic Redundancy Check (CRC) mechanism and show the sender and receiver side computation, if the 4-bit generator (G) is 1001 and the data payload (D) is 10011000. | CO3 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain Ethernet along with its Frame structure and its MAC protocol including the efficiency aspect. | CO3 | 10 |
| b. | Summarize the categories of protocols in Channel partitioning MAC and Random access MAC protocols. | CO3 | 10 |