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



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

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| **Code :** | **17CS2004** | **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. | Suppose two hosts, A and B, are separated by 20,000 kilometers and are connected by a direct link of R = 2 Mbps; also, suppose that the propagation speed over the link is 2.5 \*108 meters/sec. How long does it take a packet of length 1,000 bytes to propagate from A to B? | CO3 | 4 |
| b. | Compare and contrast circuit switching network with packet switching network. | CO2 | 6 |
| c. | Describe the four types of delay experienced in packet switched networks. | CO1 | 10 |
| **(OR)** | | | | |
| 2. | a. | Identify the five layers in the Internet protocol stack and the principle responsibilities of each of these layer. | CO1 | 10 |
| b. | Describe the various access technologies used to connect home and enterprise network. | CO1 | 10 |
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| 3. | a. | Differentiate between HTTP persistent and Non-persistent connections. | CO3 | 10 |
| b. | Consider the following network diagram. The hosts in the institutional network face the problem of bottleneck while attempting to access Origin servers. Recommend two solutions to address this problem; also, recommend a cost effective solution. | CO5 | 10 |
| **(OR)** | | | | |
| 4. | a. | Refer to the following exhibit showing the communication between two end devices and answer the following.  C:\Users\singhiman\Desktop\7.JPG   1. Which application layer, transport layer protocols involved in this communication? 2. What are the port numbers used in this communication? 3. Explain few of the commands from the client to the server and few replies received by client from server. | CO4 | 10 |
| b. | Describe the application layer protocols involved in the email application. | CO1 | 10 |
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| 5. | a. | One of the protocols in the transport layer provides connectionless service. Identify the protocol and describe the header structure. | CO2 | 10 |
| b. | Draw and explain the FSM of the sender and receiver of reliable data transfer over a channel which may introduce bit errors but will not lose the data packets. | CO6 | 10 |
| **(OR)** | | | | |
| 6. | a. | Suppose Client A initiates a Telnet session with Server S. At about the same time, Client B also initiates a Telnet session with Server S. Provide possible source and destination port numbers for   * 1. The segments sent from A to S.   2. The segments sent from B to S.   3. The segments sent from S to A.   4. The segments sent from S to B.   5. If A and B are different hosts, is it possible that the source port number in the segments from A to S is the same as that from B to S?   6. How about if they are of the same host? | CO3 | 10 |
| b. | Transmission Control Protocol is a transport layer protocol requiring connection establishment between the sender and the receiver before the transmission commences. Use sequence diagram to explain the process of three-way handshake protocol and the connection termination process. | CO4 | 10 |
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| 7. | a. | Consider a router that interconnects three subnets: Subnet 1, Subnet 2, and Subnet 3. Suppose all of the interfaces in each of these three subnets are required to have the prefix 223.1.17/24. Also suppose that Subnet 1 is required to support at least 60 interfaces, Subnet 2 is to support at least 90 interfaces, and Subnet 3 is to support at least 12 interfaces. Provide three network addresses (of the form a.b.c.d/x) that satisfy these constraints. | CO5 | 10 |
| b. | Compare and contrast IPv4 with IPv6 header structure. | CO2 | 10 |
| **(OR)** | | | | |
| 8. | a. | Illustrate Network Address Translation. | CO2 | 10 |
| b. | Suppose that an ISP owns the block of addresses of the form 128.119.40.64/26. It wants to create four subnets from this block, with each block having the same number of IP addresses. What are the prefixes (of form a.b.c.d/x) for the four subnets? Show the step-wise calculation. | CO5 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Refer to the exhibit. What is the protocol used by Host A to know the MAC address of Host C? Explain the steps involved in detail.  C:\Users\singhiman\Desktop\19.JPG | CO3 | 10 |
| b. | Draw and explain the Ethernet frame structure. | CO1 | 10 |