R18

Code No.: 18ITC17

# CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (Autonomous)

**B.E. (IT) V Sem (Main & Backlog) Examination December 2021**

## Computer Networks

**Time: 3 Hours** **Max Marks: 70**

***Note:*** Answer all questions from **Part - A** and **Part – B** at one place in the same order.

### Part – A (20 Marks)

| | | M | CO | BT |
|---|---|---|---|---|
| 1 | Why do HTTP, FTP, SMTP, and POP3 run on top of TCP rather than on UDP? | (2) | 1 | 4 |
| 2 | Suppose there is exactly one packet switch between a sending host and a receiving host. The transmission rates between the sending host and the switch and between the switch and the receiving host are R1 and R2, respectively. Assuming that the switch uses store-and-forward packet switching, what is the total end-to-end delay to send a packet of length L? (Ignore queuing, propagation delay, and processing delay.) | (2) | 1 | 3 |
| 3 | In our rdt protocols, why did we need to introduce sequence numbers and timers? | (2) | 2 | 4 |
| 4 | Suppose you wanted to do a transaction from a remote client to a server as fast as possible. Would you use UDP or TCP? Why? | (2) | 2 | 3 |
| 5 | What are the two most important network-layer functions in a datagram network? What are the three most important network-layer functions in a virtual circuit network? | (2) | 3 | 2 |
| 6 | What are the different types of messages used by ICMP protocol? | (2) | 3 | 2 |
| 7 | Write a short notes on Data Center Networking? | (2) | 4 | 2 |
| 8 | What difference does it make to the network layer if the underlying data link layer provides a connection-oriented service versus a connectionless service? | (2) | 4 | 4 |
| 9 | Write short notes on VPN? | (2) | 5 | 2 |
| 10 | A sender is employing public key cryptography to send a secret message to a receiver. Which one of the following statements is TRUE?<br>(A) Sender encrypts using receiver's public key<br>(B) Sender encrypts using his own public key<br>(C) Receiver decrypts using sender's public key<br>(D) Receiver decrypts using his own public key | (2) | 5 | 4 |

### Part – B (50 Marks)

| | | | M | CO | BT |
|---|---|---|---|---|---|
| 11 | (a) | What are the five layers in the internet protocol stack? What are the principal responsibilities of each of these layers? | (5) | 1 | 2 |
| | (b) | Describe the Services Provided by Domain Name System? | (5) | 1 | 2 |

**(OR)**

| | | | | | |
|---|---|---|---|---|---|
| 12 | (a) | Compare and Contrast circuit-switched network have over a packet-switched network? | (5) | 1 | 4 |
| | (b) | How long does it take a packet of length 1000 bytes to propagate over a link of distance 2500km, propagation speed 2.5.108m/s, and transmission rate 2mbps? More generally, how long does it take a packet of length L to propagate over a link of distance d, propagation speed s, and transmission rate R bps? Does this delay depend on packet length? Does this delay depend on transmission rate? | (5) | 1 | 5 |
| 13 | (a) | Explain Transport-layer multiplexing and demultiplexing? | (5) | 2 | 3 |
| | (b) | Demonstrate the approaches to congestion control? | (5) | 2 | 2 |
| | | **(OR)** | | | |
| 14 | (a) | Compare the TCP header and the UDP header. List the fields that are absent in the TCP header and present in the UDP header. Give reason for their absence. | (5) | 2 | 4 |
| | (b) | In Go Back 4 protocol and selective repeat protocol of Ws=3, if every $6^{th}$ packet that is being transmitted is lost and if we have to send 10 packets, then how many transmissions are required? | (5) | 2 | 5 |
| 15 | (a) | Draw the header format of IPV4 and explain about the fields in it. | (5) | 3 | 2 |
| | (b) | Explain Distance Vector routing Algorithm with an example? | (5) | 3 | 5 |
| | | **(OR)** | | | |
| 16 | (a) | Describe various broadcast routing techniques? | (5) | 3 | 3 |
| | (b) | Distinguish between Intra AS and Inter AS routing? | (5) | 3 | 4 |
| 17 | (a) | Describe Ethernet Frame Format with a neat diagram. | (5) | 4 | 2 |
| | (b) | Elaborate about Link Layer addressing and ARP in detail? | (5) | 4 | 3 |
| | | **(OR)** | | | |
| 18 | (a) | Explain in detail the Carrier Sense Multiple Access with Collision Detection (CSMA/CD). | (5) | 4 | 2 |
| | (b) | In CRC checksum method, assume that given frame for transmission is 100110011011 and the generator polynomial is $G(x) = x^4 + x + 1$. After implementing CRC encoder, calculate the encoded word sent from sender side and check for errors at the receiver side. | (5) | 4 | 5 |
| 19 | (a) | Illustrate the Concept of Hash Functions and Message Authentication Code? | (5) | 5 | 2 |
| | (b) | Explain RSA algorithm with an example? | (5) | 5 | 5 |
| | | **(OR)** | | | |
| 20 | (a) | Explain in detail about IPsec protocol. | (5) | 5 | 2 |
| | (b) | Discuss any 2 Symmetric Key Cryptography Techniques. | (5) | 5 | 5 |

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