MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : BCAC502 Computer Networking

UPID : 500128

Time Allotted : 3 Hours *Full Marks :70*

The Figures in the margin indicate full marks.
Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer *any ten* of the following : [1 x 10 = 10]

(I) What is the main role of a hub in network architecture?

(II) The Transport Layer is responsible for host-to-host communication, ensuring data is reliably delivered from one application to another. [TRUE or FALSE]

(III) HTTPS uses encryption to secure the data exchanged between a user's web browser and a web server, ensuring data confidentiality. [TRUE or FALSE]

(IV) A copper cable, such as an Ethernet cable or coaxial cable, is an example of a _____ transmission medium.

(V) What is a DNS server?

(VI) What is the main drawback of using a large window size in flow control?

(VII) What is the purpose of "reservation" in medium access control?

(VIII) In a network, what is the primary function of a switch?

(IX) What is the function of a "concentrator" in networking, and where is it commonly deployed?

(X) Firewalls are hardware or software security devices that are primarily used for detecting and eliminating computer viruses and malware. [TRUE or FALSE]

(XI) What is circuit switching in telecommunications, and what are two types of circuit switches?

(XII) What is the primary role of a router in a computer network?

Group-B (Short Answer Type Question)

Answer *any three* of the following : [5 x 3 = 15]

2. Explain the key features of Transmission Control Protocol (TCP) and its role in ensuring reliable data delivery. Describe the three-way handshake process used by TCP to establish a connection. [5]

3. What are the advantages and disadvantages of using DNS in computer networking? What is DDNS? [5]

4. Differentiate between guided and unguided transmission media. Provide examples of each and discuss the advantages and limitations of both types of media. [5]

5. Explain the significance of data transmission modes and their relationship to the performance criteria of a communication system. Provide examples of situations where different transmission modes are most suitable. [5]

6. What are the advantages of using firewalls in network security? What are the differences between Firewalls and Antivirus. [5]

Group-C (Long Answer Type Question)

Answer *any three* of the following : [15 x 3 = 45]

7. (a) How do DNS and HTTP differ in their functions and roles in web communication? [5]

(b) In what ways do SMTP and FTP differ in their usage and purposes in network communication? [5]

(c) How do Public Key Cryptography and Private Key Cryptography differ in terms of key usage and security? [5]

8. a) Explain the key components and processes involved in the Physical Layer of the OSI model, highlighting the transition from digital data to analog signals for transmission. [7+8]
b) Explain the working principles of Telephone Network

9. a) Explain the concept of transmission impairments and their impact on the performance of communication systems. [5+5+5]
b) Discuss the various types of transmission impairments and methods to mitigate their effects.

c) Provide real-world examples to illustrate the significance of addressing transmission impairments in modern communication systems.

10. a) Describe the concept of data framing in the Data Link Layer. Explain the differences between character stuffing and bit stuffing as framing techniques. [7+4+4]
    b) Provide detailed examples of when and why each framing technique is used, and discuss their implications on data transmission efficiency.
    c) Explain the working procedure of Stop & Wait ARQ protocol.
11. a) Explain the working procedure of Digital Signature. [5+5+5]
    b) Explain the role of DNS (Domain Name System) in modern internet communication. Provide a detailed description of how DNS works, its components, and its significance.
    c) How the SMTP has been worked? Explained with proper example.

*** END OF PAPER ***