HALDIA INSTITUTE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION UNDER MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL)

Paper Code: PCC-CS 503

Paper Name: Data Communication and Networks

Time Allotted: 3 Hours *Full Marks*: 70

The figures in the margin indicate full marks

Candidates are required to give their answers in their own words as far as practicable

Group – A
(Multiple Choice Type Questions)

Choose the correct alternatives from the followings: **15 x 1 = 15**

1. (i) ISDN is an example of _____ network
a) Circuit switched b) Packet switched c) Message switched d) Datagram

(ii) What is the central device in star topology?
a) STP server b) Hub/switch c) PDC d) Router

(iii) Which of the following architecture uses CSMA/CD access method?
a) ARCnet b) Ethernet c) Token Ring d) Token bus

(iv) What is the location of a resource on the internet given by?
a) Email b) IP c) Protocol d) URL

(v) The speed mismatch between the sender and the receiver is called ___.
a) error control b) speed error c) flow control d) transmission control

(vi) ___ overcame the registered number issue by assigning each organization one network number from the IPv4 address space.
a) Tracking b) Subnetting c) Packeting d) Switching

(vii) In which access method do stations take turns transmitting data in an orderly fashion?
a) Pure ALOHA b) Slotted ALOHA c) CSMA d) Polling

(viii) Which MAC sublayer protocol uses a ring topology and token passing for network access?
a) Token Ring b) FDDI c) Ethernet d) CSMA/CD

(ix) Which network type spans a large geographical area, often covering multiple cities or countries?
a) LAN b) MAN c) WAN d) VPN

(x) What is the primary difference between IPv4 and IPv6?
a) Address space b) Header format c) Security features d) Routing protocols

(xi) In classful IP addressing, what is the range of addresses in Class A?
a) 1.0.0.0 to 126.255.255.255 b) 128.0.0.0 to 191.255.255.255
c) 192.0.0.0 to 223.255.255.255 d) 224.0.0.0 to 239.255.255.255

(xii) Which routing technique involves the use of routing protocols to adapt to changes in network topology?
a) Static routing b) Dynamic routing c) Default routing d) Unicast routing

(xiii) What does DHCP stand for in networking?

a) Domain Host Configuration Protocol
b) Dynamic Host Control Protocol
c) Distributed Host Configuration Protocol
d) Dynamic Host Configuration Protocol

(xiv) What is Mobile IP used for in networking?
a) Encrypting mobile data
b) Providing mobility support for devices
c) Assigning IP addresses to mobile devices
d) Managing mobile applications

(xv) Which mechanism does TCP use to control the flow of data between sender and receiver?
a) Sliding Window
b) Stop-and-Wait
c) Go-Back-N
d) Selective Repeat

Group – B
(Short Answer Type Questions)

Attempt any three from the followings: **3 x 5 = 15**

2. Explain the functions, protocols and services of each layer of TCP? Compare it with OSI Model. 5

3. Compare IPV4 and IPV6 Header formats? 5

4. Explain the data link layer in Internet and HDLC. 5

5. Compare bit stuffing with byte stuffing with an example. 5

6. Why do we need a DNS system? What is inverse domain? 5

Group – C
(Long Answer Type Questions)

Attempt any four from the followings: **4 x 10 = 40**

7. (i) Discuss about various transmission media for data transmission.
(ii) Explain how do protocols ensure standardized data exchange, and what are some common examples of networking protocols? 5+5

8. (i) What is CRC. Explain CRC generator & CRC checks with one example.
(ii) With respect to sliding window protocol explain
i. Selective Repeat ARQ ii. Go Back N ARQ 5+5

9. (i) A 10 bit data bit block 0111010111 is to be sent using hamming code for error detection and correction. Show how the receiver corrects an error that occurs in 6th bit position from right.
(ii) Explain the Selective Repeat ARQ technique. 5+5

10. (i) Explain the concept of default routing.
(ii) Discuss how does default routing contribute to the efficiency of packet forwarding in a network, and in what situations is it commonly implemented? 5+5

11. (i) Explain how does DHCP dynamically assign IP addresses to devices on a network.
(ii) Compare and contrast the uses of SMTP, FTP and HTTP protocols. 5+5

12. (i) Explain the fundamentals of Bluetooth technology.
(ii) Describe the key technologies and standards that define wireless local area networking? 5+5