

## BCA-501

### DATA COMMUNICATION AND COMPUTER NETWORK

Time Allotted: 3 Hours

Full Marks: 70

*The questions are of equal value.*

*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)

1. Answer all questions. 10×1 = 10
- (i) The slowest transmission speeds are those of
- |                        |                   |
|------------------------|-------------------|
| (A) twisted pair wire  | (B) coaxial cable |
| (C) twisted pair cable | (D) microwaves    |
- (ii) HDLC protocol works in
- |                       |                        |
|-----------------------|------------------------|
| (A) application layer | (B) presentation layer |
| (C) session layer     | (D) data link layer    |
- (iii) The number of outgoing lines in a hub is
- |         |         |
|---------|---------|
| (A) 1   | (B) n   |
| (C) n-1 | (D) n+1 |
- (iv) What is the network address for 198.76.9.23?
- |                |                   |
|----------------|-------------------|
| (A) 198.0.0.0  | (B) 198.76.9.1    |
| (C) 198.76.9.0 | (D) none of these |
- (v) Keyboard is an example of which of the following?
- |                 |                   |
|-----------------|-------------------|
| (A) simplex     | (B) half duplex   |
| (C) full duplex | (D) none of these |

- (vi) Subnet mask of default route in  
(A) 0.0.0.0 (B) 255.255.255.255  
(C) both (A) and (B) (D) none of these
- (vii) FTP stands for  
(A) file transfer protocol (B) file tree protocol  
(C) field transfer protocol (D) none of these
- (viii) The end to end delivery of the entire message is the responsibility of  
(A) network layer (B) transport layer  
(C) session layer (D) presentation layer
- (ix) Framing is done in .....layer.  
(A) physical (B) data link  
(C) transport (D) network
- (x) Digital signature is  
(A) symmetric key cryptography  
(B) asymmetric key cryptography  
(C) both (A) and (B)  
(D) none of these

**GROUP B**  
**(Short Answer Type Questions)**

Answer any *three* questions.

3×5 = 15

2. What is IP addressing? What are the classes of IP addressing? What is the difference between static and dynamic IPs? 1+2+2
3. Explain Leaky Bucket Algorithm. 5
4. Briefly explain FDM process. 5
5. What are the advantages of digital transmission over analog transmission? 5

6. Define bit rate and baud rate. An analog signal carries four bits in each signal element. If 1000 signal elements are sent per second, find the baud rate and bit rate. 3+2

**GROUP C**  
**(Long Answer Type Questions)**

Answer any *three* questions.

3×15 = 45

7. For the bit string 10101101 draw the line coding using Unipolar NRZ, Polar RZ, Manchester and differential Manchester. What is baud rate and bit rate? 10+5
8. (a) Differentiate between TCP and UDP. 4  
(b) What is unicast, multicast and broadcast? 4  
(c) Explain IPv4 frame format. 7
9. (a) Explain three-way handshake for connection establishment. 6  
(b) How can you compare pure ALOHA and slotted ALOHA? 5  
(c) Explain dynamic model of ARP. 4
10. (a) What is cryptography? 3  
(b) Write the RSA algorithm. 7  
(c) Differentiate between Symmetric and Asymmetric key cryptography. 5
11. Write short notes on any *three* of the following: 3×5  
(a) Multiplexing  
(b) HDLC  
(c) Transmission Impairment  
(d) ATM  
(e) DNS