



BCA/DCN-601

2024

(6th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper : DCN-601

(Data Communication and Networking)

Full Marks : 70

Pass Marks : 45%

Time : 3 hours

(PART : B—DESCRIPTIVE)

(Marks : 45)

The figures in the margin indicate full marks for the questions

1. (a) Explain any two network topologies with an example and also mention the few advantages and disadvantages of it. 6
 - (b) Write a short note on the three types of transmission modes. 3
- Or
- (c) Explain in detail about peer-to-peer and client/server networks with an example. 6
 - (d) Define data communication and write about the need of computer network. 3

2. (a) Why are we using logical addressing? Explain about class A, class B and class C IP addresses with an example. 6
- (b) Write the directed broadcasting and limited broadcasting addresses for the following IP address : 3

195.168.1.10

Or

- (c) Explain about hub, router and gateway connecting devices with an example. 6
- (d) Write a short note on Fast Ethernet. 3
3. (a) Draw OSI reference model and explain in detail about the physical and data link layers functionalities. 6
- (b) Write the differences between TCP and UDP protocols. 3

Or

- (c) Define subnet and subnet mask, and mention some advantages of subnetting. Solve the following problem :

Consider :

IP address : 192.192.192.200

Subnet mask : 255.255.255.16

Find—

- (i) no. of bits borrowed from host ID for subnet ID;
- (ii) no. of subnets possible;
- (iii) subnet ID's range;
- (iv) no. of hosts per subnet. 9

4. (a) Explain about circuit switching and message switching approaches in detail. 6
- (b) Discuss about frequency division multiplexing (FDM). 3

Or

- (c) Define the term 'flow control' and write about parity bit/checking error control mechanism. 4
- (d) Explain about distance vector routing algorithm with an example. 5
5. (a) Define the terms 'message confidentiality', 'integrity', 'availability' and 'non-repudiation'. 4
- (b) Define cryptography and write a comparison between symmetric and asymmetric key cryptographies. 5

Or

- (c) Define Firewall and write the characteristics of firewalls. 4
- (d) Explain RSA algorithm with an example. 5

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(6th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper : DCN-601

(Data Communication and Networking)

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

A. Put a Tick (✓) mark against the correct answer in the brackets provided : 1×10=10

1. Which of the following LAN cables is named as thick coaxial cable?

(a) 10 base T ()

(b) 10 base 5 ()

(c) 10 base 2 ()

(d) 10 base F ()

2. Which of the following is a Layer-2 device? (Used in physical and data link layer)
- (a) Switch ()
 - (b) Brouter ()
 - (c) Gateway ()
 - (d) Hub ()
3. Which of the following IP addresses cannot be used as source IP, but it can be used as destination IP?
- (a) 123.128.255.255 ()
 - (b) 15.0.0.0 ()
 - (c) 127.15.26.27 ()
 - (d) 0.0.0.0 ()
4. Identify the false statement from the following :
- (a) The physical, data link and network layers are called as network-oriented group. ()
 - (b) A single system can have multiple physical and multiple logical addresses. ()
 - (c) In mapping from logical to physical address we are using RARP protocol. ()
 - (d) Logical address is permanent w.r.t. the system and it can be changed by the administrator easily. ()

5. _____ is a network arranged within an individual person, typically within a range of 10 metres.

(a) LAN ()

(b) MAN ()

(c) WAN ()

(d) PAN ()

6. Which of the following is cause of transmission impairment?

(a) Attenuation ()

(b) Distortion ()

(c) Noise ()

(d) All of the above ()

7. _____ is a protocol for transferring files between two network devices within a LAN.

(a) FTP ()

(b) TFTP ()

(c) SMTP ()

(d) TELNET ()

8. Which of the following is requirement of digital signature?

- (a) Easy to produce digital signature ()
- (b) Signature must be of unique pattern ()
- (c) Easy to verify and recognize digital signature ()
- (d) All of the above ()

9. What is wireless communication?

- (a) Sending data from one location to another with the use of physical medium ()
- (b) Sending data from one location to another without the use of physical medium ()
- (c) Sending data from one location to another without the use of virtual medium ()
- (d) None of the above ()

10. In TCP, sending and receiving data is done as

- (a) stream of bytes ()
- (b) sequence of characters ()
- (c) lines of data ()
- (d) packets ()

B. Indicate whether the following statements are *True (T)* or *False (F)* by putting a Tick (✓) mark : 1×5=5

1. In IEEE 802 reference model, the data link layer may use the services of network layer if it requires.

(T / F)

2. Reliability of star topology is very high compared to mesh topology.

(T / F)

3. Static routing avoids congestion.

(T / F)

4. In mono-alphabetic substitution encryption algorithm, if plain text characters are not repeated, accordingly the cipher text characters should not be repeated.

(T / F)

5. A URL (Uniform Resource Locator) is a unique identifier used to locate a resource on the Internet.

(T / F)

C. Answer the following questions in short :

2×5=10

1. Explain parallel and serial transmission.

2. Explain Repeater and Network Address Translation (NAT).

3. What is the importance of ARP and RARP protocols?

4. Define the terms 'encryption' and 'decryption'.

5. Define modulation and list any two types of modulation.
