

2014

(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Course No. : 404

(**Networking—I**)

Full Marks : 75

Time : 3 hours

(**PART : B—DESCRIPTIVE**)

(*Marks : 50*)

*The figures in the margin indicate full marks
for the questions*

1. (a) Explain different categories of networks by giving a suitable diagram. 5
- (b) What are the responsibilities of physical layer in the OSI model? Explain. 5
- Or*
- (c) Explain the layers of TCP/IP protocol suite by giving a suitable diagram. 5
- (d) Describe the four levels of addresses used in an internet employing TCP/IP protocols. Give example for each address. 5

2. (a) What is fibre-optic cable? Explain how it works by giving a suitable diagram. 5
- (b) Write the advantages and disadvantages of a fibre-optic cable. 5

Or

- (c) What are the characteristics of microwave propagation? 5
- (d) What are infrared waves? Write their advantages and disadvantages. 5
3. (a) What is sine wave? Explain its characteristics by giving a suitable diagram. 5
- (b) Explain various ways in which low-pass analog signals are converted into a bandpass signal. 5

Or

- (c) Explain the pulse code modulation technique by giving a suitable diagram. 5
- (d) Explain various methods for measuring the performance of a network. 5
4. (a) Describe with a neat diagram, the multiplexing and demultiplexing processes of frequency division multiplexing. 5
- (b) Explain the synchronous time-division multiplexing process. Also write its disadvantages over statistical time-division multiplexing. 5

Or

- (c) Explain how setup request and acknowledgement frames are sent in a virtual circuit network. 5
- (d) Write five differences between circuit-switched network and datagram network. 5
5. (a) Explain the CRC technique for error correction by giving a suitable diagram. If a CRC code with $C(7, 4)$ is used, calculate the codeword for a dataword 1001 with a divisor 1011. 5
- (b) Explain the stop-and-wait ARQ error control mechanism by giving a suitable diagram. 5

Or

- (c) What is HDLC? Explain different frame formats of HDLC. 5
- (d) Explain simple parity-check code, technique for detecting error. What will be the value of parity bit if a dataword 1001 is sent by the sender? 5

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Course No. : 404

(Networking—I)

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

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

(a) For 53 devices in a network with duplex mode link, the number of cable links required for a mesh topology is

(i) 2809 ()

(ii) 106 ()

(iii) 2756 ()

(iv) 1378 ()

- (b) Amplitude shift keying is the process of converting — signal.
- (i) digital to digital ()
 - (ii) digital to analog ()
 - (iii) analog to digital ()
 - (iv) analog to analog ()
- (c) A device capable of creating temporary connections between two or more devices connected to it is called
- (i) networking device ()
 - (ii) statistical router ()
 - (iii) switch ()
 - (iv) multiplexer ()
- (d) An analog multiplexing technique to combine optical signal is
- (i) FDM ()
 - (ii) WDM ()
 - (iii) TDM ()
 - (iv) STDM ()
- (e) To guarantee correction of up to y errors in all cases, the minimum Hamming distance d_{\min} in a block code must be
- (i) $y + 1$ ()
 - (ii) y ()
 - (iii) $2y + 1$ ()
 - (iv) $2y + 2$ ()

- (f) Framing, addressing and media access control are the responsibilities of
- (i) physical layer ()
 - (ii) data-link layer ()
 - (iii) network layer ()
 - (iv) transport layer ()
- (g) The process of adding one extra 0 whenever five consecutive 1s follow a 0 in the data is called
- (i) bit stuffing ()
 - (ii) byte stuffing ()
 - (iii) 0 stuffing ()
 - (iv) ESC stuffing ()
- (h) In selective repeat ARQ, the size of the sender and receiver window must be
- (i) at most 2^m ()
 - (ii) at least 2^m ()
 - (iii) at most one-half of 2^m ()
 - (iv) at least one-half of 2^m ()
- (i) A set of procedures used to restrict the amount of data that the sender can send before waiting for acknowledgement is
- (i) error control ()
 - (ii) flow control ()
 - (iii) Hamming distance ()
 - (iv) minimum Hamming distance ()

(j) Hamming codes can correct up to

(i) 1 error ()

(ii) 2 errors ()

(iii) 3 errors ()

(iv) 0 error ()

2. State whether the following statements are True or False by putting a Tick (✓) mark : 1×5=5

(a) Distortion means change in amplitude of a sine wave.

True () False ()

(b) Frequency division multiplexing cannot be used in telephone networks.

True () False ()

(c) In HDLC normal response mode both the sender and receiver can send and receive commands.

True () False ()

(d) In Go-Back-N ARQ, if the frame number is n , then the ACK number must be $n + 1$.

True () False ()

(e) Error detection method with $d_{\min} = 4$ can detect up to 4 errors.

True () False ()

(5)

3. Answer the following questions : 2×5=10

(a) Differentiate between broadband and baseband signal.

(b) How do guided media differ from unguided media?

(7)

- (c) What is the purpose of addressing in statistical TDM?

(8)

(d) Define piggybacking and its usefulness.

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(9)

- (e) Distinguish between linear block codes and cyclic codes.
