3TS-III(S)-11.21-0931 Reg. No. | | | | | | | | |

A

B.Tech. Degree III Semester Supplementary Examination November 2021

CS 15-1306 DATA AND COMPUTER COMMUNICATION

(*2015 Scheme*)

Time: 3 Hours Maximum Marks: 60

PART A

(Answer *ALL* questions)

(10 × 2 = 20)

I. (a) What is the difference between network layer delivery and transport layer delivery?

(b) Can we say if a signal is periodic or nonperiodic by just looking at its frequency domain plot? How?

(c) How many invalid (unused) code sequences can we have in 5B/6B encoding?

(d) Assume that a voice channel occupies a bandwidth of 4 kHz. We need to multiplex 10 voice channels with guard bands of 500 Hz using FDM. Calculate the required bandwidth.

(e) What is the significance of the twisting in twisted-pair cable?

(f) There are three communication phases involved in a circuit switched network. Match these phases with the phases in a telephone call between two parties.

(g) Distinguish between **forward error correction** and **error correction by retransmission.**

(h) Compress **BBBBHHDDXXXXKKKKWWZZZZ** using run length encoding.

(i) For each of the following networks, discuss the consequences if a connection fails.
(i). Five devices arranged in a mesh topology
(ii). Five devices arranged in a ring topology

(j) Why is there no need for CSMA/CD on a full-duplex Ethernet LAN?

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PART B

(4 × 10 = 40)

II. (a) Explain the responsibilities of each layer in the ISO-OSI model. (7)

(b) What is the propagation time if the distance between the two points is 12,000 km? Assume the propagation speed to be 2.4×10^8 m/s in cable. (3)

OR

III. (a) Encode 01001110 using (5)
(i) NRZ-L
(ii) NRZ-I

(b) Distinguish between bit rate and baud rate. An analog signal carries 4 bits per signal element. If 1000 signal elements are sent per second, find the bit rate. (5)

(P.T.O.)

IV. Explain the various transmission media. (10)

OR

V. (a) Distinguish between circuit switching and packet switching. (5)

(b) Explain the characteristics of virtual circuit networks. (5)

VI. A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is $x^3 + 1$. Show the actual bit string transmitted. (10)

Suppose that the third bit from the left is inverted during transmission. Show that this error is detected at the receiver's end.

OR

VII. Explain Go-Back-N ARQ with the help of diagrams. (10)

VIII. Explain the functions of the following network devices: (10)

(i) Hub
(ii) Bridge
(iii) Router
(iv) Gateways

OR

IX. (a) Explain ad hoc and infrastructure networks. (5)

(b) With the help of a diagram, explain Hidden Station Problem. (5)

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