



GOVERNMENT COLLEGE OF ENGINEERING, JALGAON

(An Autonomous Institute of Government of Maharashtra)

National Highway No.6, JALGAON – 425 002

Phone No.: 0257-2281522

Fax No.: 0257-2281319

Website : www.gcoej.ac.in

E-mail : princoej@redifmail.com



Name of Examination : **Summer 2021** - (Preview)

Course Code & Course Name : **CO252U - Data Communication and Networking**

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Maximum Marks : **60**

Duration : **3 Hrs**

[Edit](#) [Print](#) [View Answer Key](#) [Close](#) **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.

1) Solve any two sub questions

a) Match the following to one or more layers of the OSI model: [06]

1. Reliable process-to-process message delivery
2. Route selection
3. Defines frames
4. Provides user services such as e-mail and file transfer
5. Transmission of bit stream across physical medium
6. Ensures reliable transmission of data

b) Explain causes of transmission impairments. [06]

c) In a digital transmission, the receiver clock is 0.1 percent faster than the sender clock. How many extra bits per second does the receiver receive if the data rate is 1 kbps? [06]
How many if the data rate is 1 Mbps?

2) Solve any two sub questions

a) Obtain the 4-bit CRC code word for the data bit sequence 10011011100 (leftmost bit is the least significant) using the generator polynomial $X^4 + X^2 + 1$. [06]

b) How communication is established in circuit switching network. [06]

c) What is minimum hamming distance? Find the minimum hamming distance of the following coding table [06]

Datawords	Codewords
00	000
00	011
10	101
11	110

3) Solve any two sub questions

a) Explain different types of errors with error detection and correction. [06]

b) Explain working of stop-and-wait protocol. [06]

c) What is the window size in stop-and-wait ARQ? How many unique sequence numbers does Stop-and-Wait need? How many bits are needed to represent Stop-and-Wait's unique sequence numbers? Explain. [06]

4) a) A slotted ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. What is the throughput if the system (all stations together) produces? [06]

- a) 1000 frames per second.
- b) 500 frames per second.
- c) 250 frames per second.

b) Compare hub, switch and router. [06]

5) a) Explain FDMA. [06]

b) One hundred stations on a pure ALOHA network share an 1-Mbps channel. If frames are 1000 bits long, find the throughput if each station is sending 10 frames per second. [06]

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