



# GOVERNMENT COLLEGE OF ENGINEERING, JALGAON

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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]

- 1000 frames per second.
- 500 frames per second.
- 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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