

# COMP 204

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## Data communication

- Explain five components of data communication system
  - Explain different types of transmission medium (x2)
  - What is guided Transmission media?
  - Explain TCP/IP protocol with layer diagram
  - Compare between TCP/IP and OSI model (x4)
  - what is Transmission impairment?
  - Connectionless and connection oriented communication
  - what is multicasting? where can it be more preferable? (Yo network layer ma ni huna sakcha.)
  - What are analog and digital transmission
  - what is network topology? different network topologies in brief
  - What is internetworking? Explain connectionless internetworking with diagram
  - what is media mode?
- c. If a periodic signal is decomposed into five sine waves with frequencies of 100, 300, 500, 700 and 900 Hz, what is the bandwidth ? [1]

## Data link layer

Which of the following CRC generators guarantee the detection of single bit error?

- a.  $x^3+x+1$       b.  $x^4+x^2$       c. 1      d.  $x^2+1$

7. Explain with suitable example on how error can be detected using Checksum. [4]
10. Explain Data Encryption Standard algorithm in detail with suitable working diagram.

- How hamming code works with diagram

6. A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is  $x^3+1$ . Show the actual bits transmitted. Suppose the third bit from the left is inverted during transmission. Show that this error is detected at the receiver's end.

- Explain how RSA works with example
- Short notes on
  - Transposition cipher
  - dellie hellman key exchange protocol

- what is cryptography. What are its specific security requirements. explain different types of cryptography
  - what is flow control and error control? Design a codeword for transmission using hamming codes. The message bit is 1011011. Calculate the check bits. write the final codeword with check bits. Assume even parity is used in the hamming code.
- a. How does a single-bit error differ from a burst error? Find the Hamming distance between  $d(000, 011)$  and  $d(10101, 11110)$ . [2+1]
  - b. Explain the working of simple parity check code with diagram for encoder and decoder. Assuming 4 bit data word generate all possible codeword showing that simple parity check guarantees to detect any even number of errors. [2+1+2]