

KATHMANDU UNIVERSITY  
End Semester Examination  
March/April, 2026

Level : B.E.  
Year : II  
Time : 2 hrs. 30mins.

Course : COMP 204  
Semester : II  
F. M. : 40

SECTION "B"

[6 Q. × 4 = 24 marks]

Attempt *ANY SIX* questions:

1. ✓ Explain the OSI reference model and its importance in networking. [4]
2. Explain transmission impairments in the network. A signal of 50 mW passes through a medium with attenuation of 20 dB. Find the output power. [3+1]
3. ✓ Discuss transmission medium in detail. [4]
4. ✓ Explain how Selective Repeat ARQ is more efficient than Go-Back-N ARQ. [4]
5. ✓ What are the parameters that describe Quality of Service? Briefly, explain on the bucket algorithm that is useful for burst traffic in network. [2+2]
6. A network administrator is given the IP address 192.168.10.0/24 and needs to divide the network into 4 equal subnets. a) Determine the new subnet mask. b) Calculate the number of hosts per subnet. c) List the network address, first host, last host, and broadcast address for each subnet. [4]
7. ✓ Differentiate between Symmetric Encryption and Asymmetric Encryption. [4]

SECTION "C"

[2 Q. × 8 = 16 marks]

Attempt *ANY TWO* questions:

8. ✓
  - a. Briefly explain the concept of routing in computer networks. Differentiate between Distance Vector Routing and Link State Routing. [1+3]
  - b. Consider the following network with routers A, B, C, and D. The cost of each link is shown below.  
A-B = 2  
A-C = 5  
B-C = 1  
B-D = 4  
C-D = 3  
Calculate the following:
    - a. Construct the initial routing table for router A. [4]
    - b. Apply the Distance Vector Routing algorithm and compute the shortest path from A to all other routers.
    - c. Show the final routing table for router A after convergence.
    - d. What is the shortest path from A to D?

- 9.
- a. Explain the working mechanism of CDMA with suitable example. [5]
  - b. In a CSMA/CD network, the data transmission rate is 10 Mbps. The maximum distance between two nodes in the network is 2500 meters, and the signal propagation speed in the medium is  $2 \times 10^8$  m/s. Calculate the minimum frame size required for proper collision detection in this network. [3]
- 10.
- a. Explain the working phenomenon of hamming code with suitable diagram.
  - b. Consider the 4-bit data word 1101. Generate a 7-bit hamming code. If the received code word is 1101111, identify the error position and correct it. [4+4]