Graphic Era
HILL UNIVERSITY
Established by an Act of the State Legislature of Uttarakhand (Adhiniyam Sankhya 12 of 2011)
University under section 2(f) of UGC Act, 1956

ODD END SEMESTER BACK/DEBARRED EXAMINATION 2025

Roll no. 2161251

Name of the Course and semester: B.Tech 7th Semester
Name of the Paper: Computer Networks-II
Paper Code: TCS-703

Time: 3-hour Maximum Marks: 100

Note:
(i) All the questions are compulsory.
(ii) Answer any two sub questions from a, b and c in each main question.
(iii) Total marks for each question are 20 (twenty).
(iv) Each sub-question carries 10 marks.

Q1. (2X10=20 Marks) (CO1)

a. Define hierarchical routing and explain its advantages in large networks.
b. What is Multicast Routing, and how does it differ from unicast and broadcast routing?
c. What is the "count-to-infinity" problem in Distance Vector routing, and how is it mitigated?

Q2. (2X10=20 Marks) (CO2)

a. A sender wants to transmit a 7-bit data message 1111000 using a Cyclic Redundancy Check (CRC) with the generator polynomial $x^3 + x^2 + x + 1$.
   1. Calculate the CRC code for the given data using the generator polynomial.
   2. Determine the transmitted frame by appending the CRC code to the original data.

b. Consider How does a Link Layer switch differ from a traditional Ethernet hub?
c. How does CSMA/CD (Carrier Sense Multiple Access with Collision Detection) work in Ethernet networks?

Q3. (2X10=20 Marks) (CO3)

a. Describe the architecture and functionality of the Real-Time Streaming Protocol (RTSP). How does RTSP support the delivery of stored audio and video content over IP networks?
b. Explain the How do RTP, RTCP, and SIP work together to support real-time interactive multimedia communication?
c. Explain how VLANs (Virtual Local Area Networks) work and their advantages in modern networks.

Q4. (2X10=20 Marks) (CO4)

a. Describe the match-action paradigm in Software-Defined Networking (SDN). How is it implemented using the OpenFlow protocol for generalized packet forwarding?
b. What challenges can arise in communication between data planes and control planes?
c. What are the key advantages of generalized forwarding in modern networks?

Q5. (2X10=20 Marks) (CO5)

a. Explain What is a socket in network programming, and why is it used?

b. Explain the roles of bind(), listen(), and accept() functions in the server-side implementation of a TCP connection.

c. Write a detailed explanation of the workflow for a UDP echo server. Discuss the lack of flow control in UDP and how it affects the reliability of the communication process.