Name of the student _____

Roll no _____

NATIONAL INSTITUTE OF TECHNOLOGY HAMIRPUR
Department of Computer Science and Engineering (CSE)
END- TERM EXAMINATION May 2023

Course – BTech CSE Semester – VI	Branch – CSE
Subject Name- Computer Networks	Subject Code: CS-324
Time- 03-hours	Max.Marks-50

Note- Answer all questions.
    Draw diagrams wherever required to substantiate your answer.

Q. No.	Questions	Marks

Q.1 (a) What are network standards and why do we need them? List commonly used standards at each layer during data communication. Describe the process adopted by organizations in creating standards. Discuss the contribution of Internet Engineering Task Force (IETF) in making protocols as standards. — **5**

(b) What is net neutrality? Discuss the concept from the perspective of regulatory and technological developments for various stakeholders' viz., Internet service providers (ISPs), content providers (CPs), users and governments. Is net neutrality present in India? What is the impact of net neutrality regulations on investments in new infrastructure, innovation and free speech? Should platforms such as YouTube and WhatsApp pay a share of revenue to make up for the network costs? — **5**

Q.2 (a) Describe a standard for wireless communications based on a radio system designed for short-range cheap communications devices suitable to substitute for cables for printers, faxes, joysticks, mice, keyboards, and so on. Explain how the network connections are established in this case. Also discuss the physical layer and data link layer implementations for this standard. — **5**

(b) Describe High-level Data Link Control (HDLC) and different frame types. Demonstrate how the protocol send and receive the following frame — **5**

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Q.3 (a) Describe class based and class-less IP addressing. What is the significance of 127.0.0.1 and 10.10.10.1 IP addresses? Consider a host with IP address 10.10.10.10, prefix 10.10.10.0/24, and gateway 10.10.10.1. How will this host forward packet to following destinations? i) 10.10.10.11 ii) 10.10.11.10 iii) 10.11.10.10 — **5**
Describe two advantages and two disadvantages of NAT.

(b) The router receives a packet with a destination IP address of 192.168.2.82. The routing table contains   5
the following possible matches: 192.168.2.80/29, 192.168.2.64/27, 192.168.2.0/24. According to the
routing table, where will the router send a packet destined for 192.168.2.82?

For IP address 14.139.56.4, find out i) type of network in class based addressing ii) full
network address (including subnet) if the network is partitioned into 16 subnets iii) CIDR
prefix for the address identified in ii); iv) broadcast address

Q.4 What are the important fields in the TCP, UDP, and IP headers? Explain your answer with the help   10
of suitable diagrams of each header. What is head-of-line blocking? Describe QUIC and how it
differs from TCP. List features provided by TCP that are not provided by UDP. For each of the
following network applications, indicate whether TCP, UDP or QUIC would best serve the service
requirements of the application, and briefly explain why. State any assumptions that you make for
each application.

    i.   Live streaming video client/server.

    ii.   On- demand video

    iii.   Multiplayer online first-person shooting game

    iv.   World Wide Web

    v.   VoIP

Q.5 (a) Compare transaction-oriented and session-oriented protocols. Describe one protocol from each   5
category.

(b) Give two different examples of application-layer protocols that rely on caching to improve the user-   5
perceived performance of the network application. Explain why caching is used, where the caches
are located, and how they work.