

POKHARA UNIVERSITY

Level: Bachelor
Programme: BE
Course: Computer Networks

Semester: Fall

Year : 2019
Full Marks: 100
Pass Marks: 45
Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Define Converged Networks. Discuss the merits and demerits of Computer Networks with a suitable example. 7
b) What do you mean by Routing device? Explain design issues of layers. 8
2. a) Explain twisted pair cable on basis of Categories, Connector used, Performance and Application along with its suitable diagram. 8
b) What are the functions of LLC and MAC sub-layer? Discuss different farming approaches used in data link layer. 7
3. a) What is Error Correction? Show how FEC technique will help to detect and correct the error with suitable example. 8
b) Explain the frame format of IPV4 with a suitable diagram. 7
4. a) Differentiate between adaptive and non-adaptive routing. Explain about any intra-AS routing protocol. 8
b) Pokhara University has 3 sub division located at Pokhara as head office, Kathmandu as Examination office and Biratnagar as Contact office with 125, 60 and 29 hosts respectively. Now you as network administrator design the network with below details. 7
 - i. All the LANs must implemented router as default Gateway.
 - ii. Ensure that network is secure from inside and outside the network.
 - iii. Calculate Broadcast, Network, usable address along with subnet and wild card mask
 - iv. ISP provide IP address was 10.0.17.0/24
5. a) Differentiate TCP and UDP with a suitable example 8
b) What do you mean by congestion and source of congestion? Explain 7

traffic shaping in detail

6. a) Discuss the role of DHCP. Explain the operation of DNS in corporate Networks.
- b) What do you mean by Network security? Explain the operation of Data Encryption Standard Algorithm.
7. Write short notes on: (Any two)
- a) Integrated Services Digital Network
 - b) UDP-Connection less
 - c) Virtual Private Networks

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Attempt all the questions.

1. a) Define Computer Network. Briefly explain the different types of network model. 7
b) Why do you need layered Architecture in network? Compare OSI model with TCP/IP model. 8
2. a) Define transmission media. Explain different types of transmission media in detail. 7
b) What do you mean by framing? List the different framing technique and illustrate bit stuffing with an examples. 8
3. a) Explain the working principle of selective repeat ARQ and point out the merit and demerit of it over Go-Back -NARQ. 7
b) You are given IP Address 150.152.0.0. you need to subnet the given IP into five different Departments. Perform the subnetting and find the subnet mask, Network Address, Broadcast address and usable host address in all subnet. 8
4. a) Explain IPV4 Header format? Differentiate between IPV4 and IPV6. 7
b) What is socket address and communication? Explain the services provided by the transport layer. 8
5. a) What is congestion? Briefly explain different types of technique for Traffic shaping. 7
b) What is SSL? Explain how a request initiated by a HTTP client is served by a HTTP server. 8
6. a) What is network security? How can firewalls enhance network security? Explain how firewalls can protect a system. 7
b) Compare symmetric key encryption method with asymmetric key encryption. Encrypt the message "READ" using RSA algorithm. 8

7. Write short notes on: (Any two).

- a) Circuit switching and packet switching
- b) Email server protocol: SMTP
- c) VPN

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POKHARA UNIVERSITY

Level: Bachelor
Programme: BE
Course: Computer Networks

Semester: Fall

Year : 2020
Full Marks: 100
Pass Marks: 45
Time : 3hrs.

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Attempt all the questions.

1. a) Describe the demerits of computer network. Differentiate between client/server and peer-to-peer network models. 7
b) How are interfaces, protocols and services of layered system related? Discuss the differences between OSI and TCP/IP models. 8
2. a) List the major function of Internetworking device. Briefly explain the design issues of network Layer? 7
b) What are the metrics of network performances? Describe them in short. 8
3. a) Explain how selective repeat works with figure. 7
b) Describe framing by character count. How does byte stuffing overcome the disadvantages of character count algorithm? 8
4. a) Why summarization is important? P.U. is planning to design new network for four different departments. Each department consists of 24 hosts with IP address 172.16.1.0/27. Explain the process how you will allocate the IP address, subnet mask for each of the department using above IP address. 8
b) Explain IPV4 header protocol format and also differentiate between IPV4 and IPV6 features. 7
5. a) Describe 4 way TCP handshaking with suitable diagram. 8
b) Why congestion is prominent in Networks?. Explain Explicit and Implicit control algorithm with a suitable example. 7
6. a) What is SMTP? Differentiate POP and IMAP protocols. 8
b) What do you mean by Network security? Explain the operation of Data Encryption Standard Algorithm. 7

7. Write short notes on: (Any two)

- a) CSMA/CD
- b) DHCP
- c) Firewall

Level: Bachelor
Programmer: BE
Course: Computer Networks

Pokhara University
Semester-Spring

Year: 2020
Full Marks: 70
Pass Marks: 31.5
Time: 2 hrs.

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Attempt all the questions.

Section A: ($5 \times 10 = 50$)

- Q No 1 Define Computer Networks. Discuss its merits and demerits and also the area of application in today's world. 10
- Q No 2 What do you understand by Client server and Peer to Peer architecture? Compare and Contrast between them with suitable diagram. 10

OR

- Explain about the operation of CSMA/CD technique with its flowchart. Discuss about Go Back N ARQ and Selective Repeat ARQ in brief. 10
- Q. No 3 Show how Hamming code technique will be used to compute error detection and correction with an example. (Assume a 7-bit number) 10
- Q. No 4 Compare IPv4 and IPv6 header with their header diagrams. 10
- Q. No 5 Define congestion and explain about leaky bucket and token bucket algorithm in brief. 10

Section B: ($1 \times 20 = 20$)

- Q.N 6 a) The existing network of Pokhara university ($172.16.0.0/16$) is to be subdivided into four different schools located at different states of the country connected with Network Service Provider (NSP). The location details of each school are enlisted below. 10
- School of Engineering – Pokhara
 - School of Law – Kathmandu
 - School of Management – Chitwan
 - School of Environment Research and Development – Nepalgunj

Design the network with complete IP Address plan for each school.

- b) In RSA cryptosystem, a participant A uses two prime numbers $p = 13$ and $q = 17$ to generate her public and private keys. If the public key of A is 35, then what is the private key of A? 10

POKHARA UNIVERSITY

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Semester: Spring

Year : 2025
Full Marks : 100
Pass Marks : 45
Time : 3 hrs.

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Attempt all the questions.

1. a) Define Local Area Network. Discuss on merits and demerits of Computer Network. 7
- b) Explain the working principle of different types of network hardware devices: NIC, hub, switch, bridge, and router. 8
2. a) Explain transmission media and its types with examples. 5
- b) What is packet switching? How is this different from other switching techniques? 5
- c) What is framing? Explain the MAC framing format. 5
3. a) What is flow control? Explain different types of flow control mechanism. 7
- b) Illustrate cyclic redundancy check method for error control with an example. 8

OR

When does collision occur during channel access? Mention the algorithm of CSMA/CD in detail.

4. a) Imagine yourself as a skillful computer network administrator. Given an IP address of 195.169.11.0/25, your responsibility is to create four subnetworks for four departments namely A,B,C,D that require 88, 44, 22 and 11 hosts respectively. Find out the subnetwork address, broadcast address, and ranges of host addresses, subnetwork masks and wildcard masks for each department. 7
- b) Compare the header format of Internet Protocol version 4 (IPv4) with IPv6 and mention the strategies of IPv6 Implementation. 8

OR

What are autonomous systems in computer networking? Explain distance vector routing.

5. a) List out and explain TCP client/server socket flow with suitable diagram. 8
- b) How does congestion occur in computer network? Explain the different types of closed looped congestion control. 7
6. a) Discuss the role of DHCP. Explain different queries used in DNS server. 8
- b) Define Diffie-Hellman Key Exchange Protocol using an example. 7
7. Write short notes on: (Any two) 2x5
 - a) Classless Inter-domain Routing
 - b) Client server model
 - c) Protocols and standards

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1. a) Explain different network topologies used for computer networking with merits and demerits of each. 7
- b) Explain the different layers of TCP/IP model and write any four merits over OSI model. 8
2. a) What are the responsibilities of Physical Layer. Explain the services of Integrated Services Digital Network (ISDN) signalling and Architecture. 8
- b) What is flow control? Explain different types of flow control mechanism. 7
3. a) Illustrate checksum method for error control with an example. 8

OR

- How does collision avoided during channel access? Mention the algorithm of CSMA/CD in detail.
- b) Given an IP address of 205.20.11. 0 / 25, create four subnetworks for four departments namely A, B, C, D that require 66, 33, 22 and 11 hosts respectively. Find out the subnetwork address, broadcast address, and ranges of host addresses, subnetwork masks and wildcard masks for each department. 7
 4. a) Draw the header format of Internet Protocol version 4 (IPv4) and mention the strategies of IPv6 Implementation. 8
 - b) Explain the concept of socket programming in the transport layer protocol. 7
 5. a) What is bursty traffic? Explain the process of leaky bucket algorithm to address congestion during packet propagation. 7
 - b) What are DNS Servers. Explain HTTP, FTP & proxy server overview. 8

6. a) What do you mean by cryptography? Explain with algorithm Public vs Private Key Cryptography. 8
- b) What do you mean by Next Generation Network? Explain firewall and Digital Certificate. 3+4
7. Write short notes on: (Any two) 2×5
- a) Networking hardware
- b) Packet switching vs message switching
- c) TCP vs UDP

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