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Guru Nanak Dev Engineering College, Ludhiana			
Department of Information Technology			
Program	B.Tech.	**Semester**	4th
Subject Code	PCIT-104	**Subject Title**	DCCN
(MST) No.	12	**Course Coordinator**	Mohanjit Kaur Kang
Max. Marks	24	**Time Duration**	1hr 30 mins
Date of MST		**Roll Number**	

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	Compare LAN and WAN.	CO1, L2	2
Q2	Periodic signal is decomposed into 5 sine waves with frequencies of 100,300,500,700 and 900hz.Evaluate the bandwidth. A sine wave is having 1/6 cycle with respect to time 0. What is phase in degrees And radians.	CO3, L5	2
Q3	Discuss at least two network topologies with the appropriate pros and cons.	CO3, L2	4
Q4	Elaborate the different layers used in OSI. How the layers play distinct role in design and operations in network.	CO1, L3	4
Q5	Compare and Contrast circuit switching and packet switching by providing at least 5 key distinctions in their operations and functionality.	CO2, L4	4
Q6	Analyze SMTP and POP3 protocols implemented during the email transfer. Justify your answer with appropriate diagram.	CO3,L4 CO6,L6	8

Course Outcomes (CO)

Students will be able to

1	Understand Network essentials, Network Architecture, TCP/IP and OSI model.
2	Analyze and solve networking problems in the area of guided and unguided transmission media.
3	Illustrate multi - channel access protocols and IEEE 802standards for LAN and MAN.
4	Contrast the design issues and working of protocols at different layers of TCP/IP and OSI models.
5	Formulate the various congestion and routing algorithms.
6	Implement the concepts of N/W security and protocols such as HTTP, FTP, Telnet, DNS.

RBT Classification	**Lower Order Thinking Levels (LOTS)**			**Higher Order Thinking Levels (HOTS)**		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Create

Guru Nanak Dev Engineering College, Ludhiana

Department of Information Technology

Program	B.Tech.	**Semester**	6
Subject Code	PCIT-103	**Subject Title**	DCCN
(MST) No.	2	**Course Coordinator**	Mohanjit Kaur Kang
Max. Marks	24	**Time Duration**	1hr 30 mins
Date of MST		**Roll Number**	

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	How does the framing of information in media and communication impact people's perceptions and decision-making, and can you provide examples of framing effects in real-world contexts?	CO3, L1	2
Q2	Illustrate variations in the control fields of HDLC frames impact the efficiency and reliability of data transmission in a network, and, what strategies could be employed to optimize control field usage for specific network requirements?	CO4, L4	2
Q3	Discuss CSMA/CD.	CO4, L3	4
Q4	Write short note on a) ALOHA b) Ethernet	CO3, CO5, L2	4
Q5	Elaborate how error control and correction codes be effectively applied in the context of modern communication systems.	CO4, L4	4
Q6	Analyze and evaluate the complexities of the Data Link layer in network communication, taking into account all its roles and responsibilities in ensuring seamless data transmission and network performance	CO3, CO4, L5	8

Course Outcomes (CO)

Students will be able to

1	CO1 Understand Network essentials, Network Architecture, TCP/IP and OSI model.
2	CO2 Analyze and solve networking problems in guided and unguided transmission media
3	CO3 Illustrate multi - channel access protocols and IEEE 802standards for LAN and MAN
4	CO4 Contrast the design issues and working of protocols at different layers of TCP/IP and OSI models
5	CO5 Formulate the various congestion and routing algorithms CO6 Implement the concepts of N/W security and protocols such as HTTP, FTP, Telnet, DNS

RBT Classification	**Lower Order Thinking Levels (LOTS)**			**Higher Order Thinking Levels (HOTS)**		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Create

Guru Nanak Dev Engineering College, Ludhiana

Department of Information Technology

Program	B.Tech.(IT)	**Semester**	3
Subject Code	PCIT-103	**Subject Title**	Data Communication and Computer Network
Mid Semester Test (MST) No.	1	**Course Coordinator(s)**	Dr. Manpreet Singh
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	28th Sept. 2022	**Roll Number**	2104547

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	Compare LAN with WAN.	CO1, L4	2
Q2	Calculate the capacity of the channel with SNR of 36dB and bandwidth of 2MHz.	CO3, L5	2
Q3	How Analog signal is different from digital signal?	CO2, L5	4
Q4	Generate the CRC code for the following: Message:1001 Divisor: 1011	CO6, L2	4
Q5	Compare FDM with TDM.	CO2, L4	4
Q6	Elaborate TCP/IP model with the help of labeled diagram.	CO1, L2	8

Course Outcomes (CO)

Students will be able to

1	Understand Network essentials, Network Architecture, TCP/IP and OSI model.
2	Analyze and solve networking problems in the area of guided and unguided transmission media.
3	Illustrate multi - channel access protocols and IEEE 802standards for LAN and MAN.
4	Contrast the design issues and working of protocols at different layers of TCP/IP and OSI models.
5	Formulate the various congestion and routing algorithms.
6	Implement the concepts of N/W security and protocols such as HTTP, FTP, Telnet, DNS.

RBT Classification	**Lower Order Thinking Levels (LOTS)**			**Higher Order Thinking Levels (HOTS)**		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

EVENING

[Total No. of Pages: 01]

[Total No. of Questions: 09]

Uni. Roll No. .....

Program/ Course: B.Tech. (Sem. 3)
Name of Subject: Data Communication and Computer Networks
Subject Code: PCIT-103
Paper ID: 16043

Max. Marks: 60

Time Allowed: 3 Hours

NOTE:

1) Part-A and B are compulsory
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately

Section – A **[Marks: 02 each]**

Q1.

(a) List the different applications of computer networks?
(b) Define Multiplexing.
(c) What is www?
(d) What is subnetting?
(e) Calculate the capacity of the channel having bandwidth of 10Hz and signal to noise ratio of 100 dB?
(f) Differentiate between persistent and non-persistent CSMA.

Section – B **[Marks: 04 each]**

Q2. Generate the hamming code for 10010.

Q3. Write a short note on DNS.

Q4. Explain the working of sliding window flow control with the help of labeled diagram.

Q5. How throughput is improved in slotted ALOHA over pure ALOHA?

Q6. Compare TCP with UDP protocol.

Q7. Discuss frequency division multiplexing.

Section – C **[Marks: 12 each]**

Q8. Evaluate the distance vector routing algorithm using suitable example.

OR

* Evaluate the Link State Routing algorithm using suitable example.

Q9. Explain the working of OSI model using labeled diagram.

OR

* Explain the working of TCP/IP model using labeled diagram.

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EVENING

07 DEC 2019

[Total No. of Questions: 09] [Total No. of Pages: 02]

Uni. Roll No. .....

Program/ Course: B.Tech. (3rd Semester)
Name of Subject: Data Communication and Computer Networks
Subject Code: PCIT-103
Paper ID: 1134

Time Allowed: 03 Hours. Max. Marks: 60

NOTE:
1) Parts A and B are compulsory
2) Part –C has Two Questions Q8 and Q9. Both are compulsory , but with internal choice
3) Any missing data may be assumed appropriately

Section – A

[Marks: 02 each]

Q1.
a) Identify any four components used in the data communications system?
b) A host communicates with another host using the TCP/IP protocol suite. What is the unit of data sent or received at network layer?
c) Give any two Key Differences between TCP and UDP?
d) List two differences in DNS and DHCP?
e) When a party makes a local call to another party, is this a point-to-point or multiple connections? Comment and Justify.
f) You have been allocated a class C network address of 211.1.1.0 and are using the default subnet mask of 255.255.255.0. How may hosts can you have?

Section – B

[Marks: 04 each]

Q2. Differentiate among Twisted Pair, Coaxial Cable and Fiber Optics transmission media.

Q3. Describe frame format of IEEE 802.3.

Q4. Define Connection Oriented and Connection less Services .Give two Computer applications of Connection-oriented Services.

Q5. We have a channel with a 1-MHz bandwidth. The SNR for this channel is 63. What is the appropriate bit rate and signal level?

Q6. Use CRC method to check whether the received data 110010 is correct or not where G=1010?

Q7. Subnet the Class C IP Address 205.11.2.0 , so that you have 30 subnets.

a) What is the subnet mask for the maximum number of hosts?

b) How many hosts can each subnet have?

c) What is the IP address of host 3 on subnet 2 ?

EVENING

07 DEC 2019 [Marks: 12 each]

Section – C

Q8. Explain OSI Reference Model in detail. Mention Protocols of each layer of OSI reference model

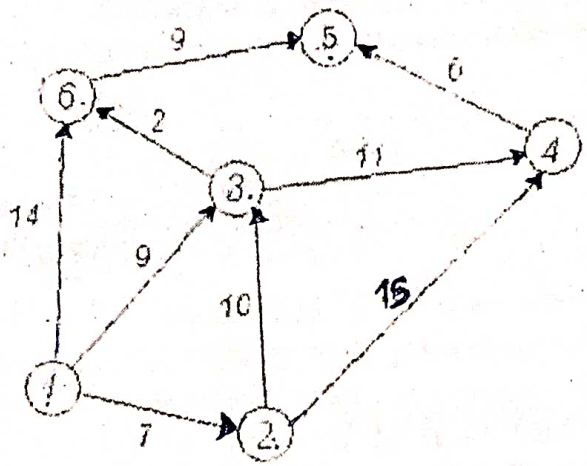
OR

Explain Sliding Window protocol in detail.

Q9. Computer A has 19.5MB to send on a network and transmits the data in a burst @ 6 Mbps. The maximum transmission rate across routers in the network is 4 Mbps. If Computer A's transmission is shaped using a leaky bucket, how much capacity must the queue in the bucket hold not to discard any data?

OR

Find shortest path from node 1 to all other nodes using Dijkstra's Algorithm



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7. Calculate a) network address b) host address c) number of networks d) number of hosts e) subnet mask for

i) 102.45.09.5

ii) 197.64.3.8

Part – C

[Marks: 12 each]

8. With a neat diagram explain the OSI reference model in detail? Explain the functions performed in each layer.

OR

* What is classfull addressing? Discuss class A, class B, class C, class D, class E address with its range in decimal dotted notation and example.

9. Explain the CSMA protocols in detail.

OR

* Evaluate the distance vector routing algorithm using suitable examples

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2203751

Please check that this question paper contains_09___ questions and ___02_ printed pages within first ten minutes.

[Total No. of Questions: 09] [Total No. of Pages: ..02...]

Uni. Roll No. 2203751

Program: B.Tech (Batch 2018 onward)
Semester: 3rd
Name of Subject: Data Communication and Computer Networks
Subject Code: PCIT-103
Paper ID: 16043

Max. Marks: 60

Time Allowed: 03 Hours

NOTE:

1) Parts A and B are compulsory
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately

[Marks: 02 each]

Part – A

Q1.

a) Define Flow Control and Error Control.
b) Write a short note on DNS and its functions.
c) What do you understand by subnetting?
d) Describe ARP and RARP.
e) Calculate the checksum for the following packets. 10110 11010 10001
f) Find the maximum capacity of a medium with a bandwidth of 750 KHz and a signal to noise ratio of 30 dB?

[Marks: 04 each]

Part – B

Q2. Explain the working of Sliding Window Flow Control with a labelled diagram.
Q3. Explain the Shielded Twisted Pair(STP) and Unshielded Twisted Pair(UTP)
Q4. Discuss frequency division multiplexing.
Q5. Analyse how the Congestion prevention policies work.
Q6. Compare and contrast IPv4 and IPv6.
Q7. Compare and contrast TCP and UDP protocols.

P.T.O.

Part – C

[Marks: 12 each]

Q8. Explain the working of OSI model using labelled diagram.

OR

Explain the working of TCP/IP model using labelled diagram.

Q9. Explain and analyse the CSMA Protocol in detail. What is difference between non-persistent CSMA and p-persistent CSMA?

OR

Evaluate the distance vector routing algorithm with the suitable examples.

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Please check that this question paper contains 09 questions and 02 printed pages within first 10 minutes.

[Total No. of Questions: 09] [Total No. of Pages:02]

Uni. Roll No. .....

MORNING

13 MAY 2023

Program/ Course: **B.Tech. (Sem. 3rd)**
Name of Subject: **Data Communication and Computer Networks**
Subject Code: **PCIT-103**
Paper ID: 16043

Time Allowed:3 Hours **Max. Marks:60**

NOTE:

1) **Parts A and B are Compulsory**
2) **Part C** has Two Questions Q8 and Q9. Both are compulsory, but with internal choice.
3) Any missing data may be assumed appropriately.

Part – A **[Marks: 02 each]**

Q1.

a) What is the difference between LAN and WAN?
b) List the various types of media used for networking.
c) Differentiate between message and packet switching.
d) What are the design issues in data link layer?
e) Distinguish between static and dynamic allocation.
f) Why are protocols needed?

Part – B **[Marks: 04 each]**

Q2. What do you meant by network topology? Explain the different network topologies.

Q3. Explain the OSI reference model with neat diagram.

Q4. Discuss in detail about the functions of network layer and transport layers

Q5. How does Leaky bucket algorithm works?

Q6. Illustrate the working of CSMA / CD and CSMA/CA protocol

Q7. Formulate the working of Email in detail.

Part – C **[Marks: 12 each]**

Q8. Develop with examples the three mechanisms by which congestion control is achieved in TCP. Differentiate these mechanisms.

OR

Explain in detail a) flow control and buffering b) Domain Name System

Q9. Elaborate the various data link protocols for noisy and noiseless channels

OR

Explain how to build network with TCP/IP reference model.

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Please check that this question paper contains_9___ questions and __2__ printed pages within first ten minutes.

[Total No. of Questions: 09] [Total No. of Pages: 09]

Uni. Roll No. .....

MORNING

19 JUN 2023

Program: B.Tech. (Batch 2018 onward)
Semester: 4th
Name of Subject: Data Communication and Computer Networks
Subject Code: PCIT-103
Paper ID: 16043
Scientific calculator is Not Allowed

Detail of allowed codes/charts/tables etc. Nil

Time Allowed: 03 Hours **Max. Marks: 60**

NOTE:

1) Parts A and B are compulsory
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately

Part – A **[Marks: 02 each]**

Q1.

a) Calculate BW of noiseless channel having max bit rate of 12 kbps & 4 signal levels.

b) What are the three criteria necessary for an effective and efficient network?

c) List the various issues in data link layer?

d) Point out the metrics used in determining the best path for a routing protocol?

e) Define piggybacking?

f) Define the IEEE 802.3 frame format.

Part – B **[Marks: 04 each]**

Q2. Compare Circuit switching with Packet switching.

Q3. What is hamming code? Generate the hamming codeword for the ASCII character "U"= 1010101. Assume even parity for the hamming code.

Q4. Compare between Pure and slotted ALOHA.

Q5. Explain in detail a) E-mail b) Domain Name System

Q6. Derive the relation for protocol performance for a) Stop and wait flow control mechanism. b) Sliding window protocol mechanism.

Q7. How IP addresses are represented? How does ARP and RARP works?

Part – C **[Marks: 12 each]**

Q8. If a periodic signal is decomposed into five sine waves with frequencies of 200,400, 600, 800, and 1000 Hz, what is its bandwidth? Draw the spectrum, assuming all components have maximum amplitude of 10 V.

OR

Describe the working of Leaky bucket regulator. A computer on 6 Mbps network is regulated by token bucket. The token bucket is filled at the rate of 1 Mbps. It is initially filled to capacity with 8 megabits. How long can the computer transmit at the fill of 6Mbps?

Q9. Develop with examples the three mechanisms by which congestion control is achieved in TCP. Differentiate these mechanisms.

OR

Describe the services provided to upper layers by transport layer. Compare UDP and TDP.

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