

# CBCS SCHEME

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18CS52

## Fifth Semester B.E. Degree Examination, Feb./Mar. 2022 Computer Networks and Security

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Differentiate between :  
(i) HTTP and FTP      (ii) SMTP and HTTP      (iii) UDP and TCP      (10 Marks)  
b. Explain Cookies and Web Caching with diagram.      (10 Marks)

OR

- 2 a. Describe in detail the services offered by DNS and explain DNS message format.      (08 Marks)  
b. Compare HTTP and SMTP.      (04 Marks)  
c. Define Socket. Demonstrate the working of TCP-Socket.      (08 Marks)

### Module-2

- 3 a. With the help of FSM, describe the two states of the sender side and one state of the receiver side of rdt2.0      (10 Marks)  
b. With a neat diagram, demonstrate the working of Go-BACK-N protocol.      (10 Marks)

OR

- 4 a. Describe TCP connection management with help of diagram.      (10 Marks)  
b. Interpret the FSM to TCP congestion control.      (10 Marks)

### Module-3

- 5 a. Explain the Implementation of virtual circuit services in Computer Network.      (07 Marks)  
b. Explain the three Switching Techniques.      (06 Marks)  
c. Explain Distance vector algorithm using three nodes network.      (07 Marks)

OR

- 6 a. Explain Dijkstra's algorithm with example.      (10 Marks)  
b. Explain various broadcast routing algorithms.      (10 Marks)

### Module-4

- 7 a. Explain Feistel structure of DES Algorithm.      (10 Marks)  
b. Explain RSA Algorithm with an example.      (10 Marks)

OR

- 8 a. In the Diffie - Hellman key exchange protocol prove that the two keys  $k_1$  and  $k_2$  are equal.      (10 Marks)  
b. Discuss the following :  
(i) Secure Hash Algorithm      (ii) Firewalls.      (10 Marks)

### Module-5

- 9 a. Explain briefly how DNS redirects a users request to a CDN server.      (10 Marks)  
b. With neat diagram explain the naïve-architecture for audio/video streaming.      (10 Marks)

OR

- 10 a. Write a short notes on :  
(i) Netflix video streaming platform      (ii) VOIP with Skype.      (10 Marks)  
b. With neat diagram explain the RTP header fields.      (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg,  $42+8=50$ , will be treated as malpractice.

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## Fifth Semester B.E. Degree Examination, Jan./Feb. 2021 Computer Networks and Security

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. What are the different transport services available to applications? Explain. (07 Marks)
- b. Explain HTTP request and response message format. (08 Marks)
- c. Write a note on FTP and discuss about FTP command and replies. (05 Marks)

OR

- 2 a. What are the steps involved between client and server in order to fetch 10 JPEG images, which are residing in the same server by using non-persistent HTTP connection. The URL for base HTML file is `http://www.xyz.edu/department/base.index`. (07 Marks)
- b. With a neat diagram and explain, explain how DNS server will interact to various DNS server hierarchically. (05 Marks)
- c. Illustrate how user1 can send mail to user2, and how user2 receives the mail by using SMTP. (08 Marks)

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### Module-2

- 3 a. How multiplexing and demultiplexing for a connectionless oriented will be performed at transport layer? (06 Marks)
- b. Describe the various fields of UDP segment and also explain about UDP checksum with an example. (07 Marks)
- c. Explain how TCP provides a flow control service by using different variables. (07 Marks)

OR

- 4 a. Explain the operation of selective repeat protocol. (06 Marks)
- b. Explain all the fields in a TCP segment. (07 Marks)
- c. How TCP connection management is done for three way handshake by the client and server for establishing and closing a connection. Explain. (07 Marks)

### Module-3

- 5 a. Explain distance vector algorithm with an example. (08 Marks)
- b. Explain the three switching techniques in a router. (06 Marks)
- c. Draw IPv6 datagram format, mention the significance of each fields. (06 Marks)

OR

- 6 a. Explain link state algorithm with an example. (08 Marks)
- b. Describe the intra-AS routing protocol : RIP in detail. (06 Marks)
- c. Discuss about uncontrolled flooding and controlled flooding in broadcast routing algorithm. (06 Marks)

**Module-4**

- 7 a. Classify the different network attacks and explain denial of service attack. (07 Marks)  
b. What are the two different techniques used to protect network from attacks? Explain. (07 Marks)  
c. Write the steps involved in Data Encryption Standard (DES) along with a diagram. (06 Marks)

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OR

- 8 a. Explain key generation, encryption and decryption phases in RSA algorithm. Illustrate with an example. (07 Marks)  
b. Explain the technique involved in Hash function for authentication along with a diagram. (07 Marks)  
c. Discuss about packet filtering and proxy server with respect to firewalls. (06 Marks)

**Module-5**

- 9 a. What are the classification in multimedia network applications? Explain. (08 Marks)  
b. What are the two types of loss anticipation schemes? Explain. (07 Marks)  
c. What do you mean by a Jitter and how to remove the Jitter at the receiver for audio by fixed and adaptive play out delay? (05 Marks)

OR

- 10 a. Explain the working of CDN. (08 Marks)  
b. Explain about HTTP streaming in case of streaming stored video. (07 Marks)  
c. Discuss about the properties of audio and video in multimedia networking. (05 Marks)

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## Fifth Semester B.E. Degree Examination, July/August 2022 Computer Networks and Security

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- Explain the steps involved in transferring a web page from server to client in case of HTTP with non – persistent connection. Also brief the Back of the Envelope calculation for time needed to request and receive the file. (10 Marks)
  - Consider an e – commerce site that wants to keep a purchase record for each of its customers. Describe with neat diagram how this can be done with cookies. (10 Marks)

OR

- Explain with neat diagram, the socket related activity of client – server communication over the TCP along with client and server code. (10 Marks)
  - Explain FTP with its Commands and Replies. (10 Marks)

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### Module-2

- Describe the various fields of UDP segment structure. Suppose you have the following three 16 – bit words 0110011001100000, 0 1 0 1 0 1 0 1 0 1 0 1 0 1, 1000111100001100. Find the checksum. How does the receiver detect errors? Is it possible that 1 – bit errors will go undetected? (10 Marks)
  - Explain Sender and Receiver side Finite State Machine (FSM) representation for rdt 2.1 protocol. (10 Marks)

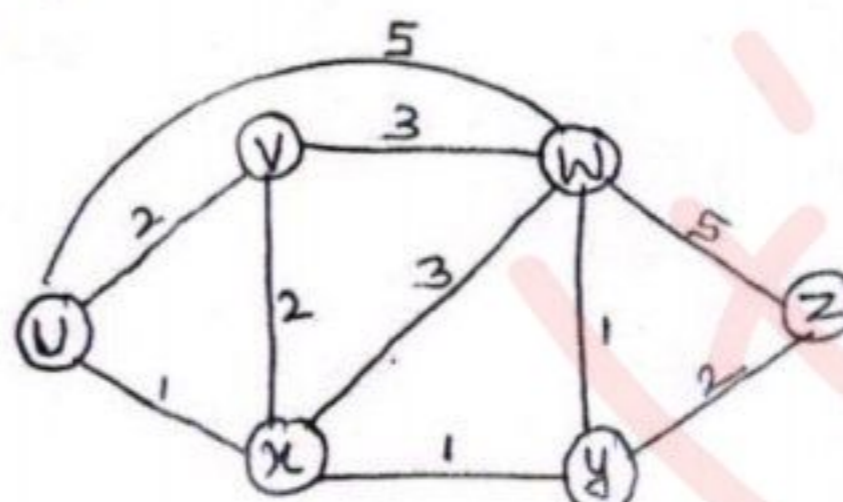
OR

- Draw TCP Segment structure. Describe the various fields of TCP segment structure. (10 Marks)
  - Explain with neat diagram, the causes and costs of congestion considering the following scenarios.  
Scenario 1 : Two sender, A Router, with Infinite Buffer.  
Scenario 2 : Two sender, A Router, with Finite Buffer. (10 Marks)

### Module-3

- Write Link state Routing Algorithm. Apply it to the following graph [Refer Fig. Q5(a)] with source node as “U”. Draw the least cost path tree and the forwarding table for node “U”. (10 Marks)

Fig. Q5(a)



- Draw IPV4 datagram format. Mention the significance of each field. (10 Marks)

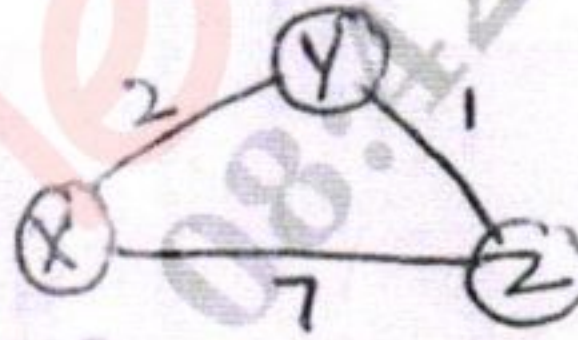
Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Write distance Vector Routing Algorithm and apply it to the following graph.  
[Refer Fig. Q6(a)].

(10 Marks)

Fig. Q6(a)



- b. Draw IPV6 datagram format. Mention the significance of each field.

(10 Marks)

**Module-4**

- 7 a. Explain Diffie – Hellman Key Exchange Protocol. Suppose two parties A and B wish to set up a common secret key between themselves using Diffie Hellman Protocol selecting generator as 3 and prime number as 7. Party A chooses 2 and Party B chooses 5 as their respective secret. Find the Diffie Hellman Key. (10 Marks)
- b. Explain Data Encryption Standard (DES) algorithm. (10 Marks)

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OR

- 8 a. Explain three phases of RSA Algorithm. For an encryption of a 4 – bit message “1000” or  $M = 9$  we choose  $a = 3$  and  $b = 11$ . Find the Public and Private keys for this security action and show the Cipher text. (10 Marks)
- b. Write short notes on :
- Security Implementation in wireless IEEE 802.11.
  - Firewalls. (10 Marks)

**Module-5**

- 9 a. Explain how DNS Redirects a User’s request to a CDN Server. (10 Marks)
- b. Explain RTP Basics and RTP packet Header fields. (10 Marks)

OR

- 10 a. Explain the properties of Audio and Video. Also mention the three key distinguishing features of Streaming Stored Video. (10 Marks)
- b. With neat diagram, explain Session Initiation Protocol (SIP) Call establishment. (10 Marks)

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## Fifth Semester B.E. Degree Examination, July/August 2021 Computer Networks and Security

Time: 3 hrs.

Max. Marks: 100

**Note:** Answer any FIVE full questions.

- 1 a. Describe HTTP with persistent and non-persistent connections. (10 Marks)  
b. Write a note on web caching. (05 Marks)  
c. Explain SMTP with example. (05 Marks)
- 2 a. Define a Socket. Describe the socket programming using TCP. (10 Marks)  
b. Describe in detail the services provided by DNS and explain the DNS message format. (10 Marks)
- 3 a. Illustrate TCP and UDP segment structure with a help of diagram. (10 Marks)  
b. With an FSM, explain the three phases of congestion control. (10 Marks)
- 4 a. Explain the stop and wait protocol with FSM representation rdt2.1. (10 Marks)  
b. Explain the concept of transport layer multiplexing and De-Multiplexing. (10 Marks)
- 5 a. What is routing? Explain the structure of router. (10 Marks)  
b. Explain IPV4 datagram format with neat diagram. (10 Marks)
- 6 a. Explain Dijkstra's algorithm with example. (10 Marks)  
b. Discuss the IPV6 packet format. (06 Marks)  
c. List the broadcast routing algorithms. Explain any one of them. (04 Marks)
- 7 a. Explain four types of internet infrastructure attacks in Network security. (10 Marks)  
b. What is secret-key encryption protocols? Explain DES algorithm. (10 Marks)
- 8 a. Discuss the secure Hash Algorithm. (05 Marks)  
b. Explain IP security and IPsec. (05 Marks)  
c. Explain RSA Algorithm. Using RSA algorithm encrypt a message  $M = 9$ . Assume  $p = 3$  and  $q = 11$ . Find public and private keys and also show the cipher text. (10 Marks)
- 9 a. List the categories of streaming stored video. Explain one of them. (10 Marks)  
b. Bring out the leaky bucket mechanism for traffic policing. (10 Marks)
- 10 a. Write a short notes on:  
i) Netflix video streaming platform  
ii) VOIP with skype. (10 Marks)  
b. Explain the types of multi media network applications. (10 Marks)

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## Model Question Paper-1 with effect from 2018-19 (CBCS Scheme)

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### Fifth Semester B.E. Degree Examination COMPUTER NETWORKS AND SECURITY

TIME: 03 Hours

Max. Marks: 100

Note: Answer any **FIVE** full questions, choosing **ONE** question from each **Module**.

Module – 1			
<b>Q.1</b>	(a)	Explain client-server and Peer-to-Peer architecture	6Marks
	(b)	Define Socket. Demonstrate the working of TCP Socket	8Marks
	(c)	Explain the working of BitTorrent for file distribution.	6Marks
<b>OR</b>			
<b>Q.2</b>	(a)	Describe in detail the services offered by DNS and explain DNS message format.	8Marks
	(b)	Compare HTTP and SMTP	4Marks
	(c)	With a diagram explain the interaction of the various DNS servers.	8Marks
<b>Module – 2</b>			
<b>Q.3</b>	(a)	Explain the concept of transport layer Multiplexing and De-multiplexing.	6Marks
	(b)	With neat diagram, explain TCP segment structure and its fields.	6Marks
	(c)	Explain in brief, TCP congestion control mechanism.	8Marks
<b>OR</b>			
<b>Q.4</b>	(a)	Explain the stop and wait protocol with FSM representation rdt2.1	8Marks
	(b)	With neat diagram, explain Selective Repeat protocol.	6Marks
	(c)	Explain in brief, TCP connection Management process.	6Marks
<b>Module – 3</b>			
<b>Q.5</b>	(a)	Explain the three switching techniques	6Marks
	(b)	Explain distance vector algorithm.	7 Marks
<b>(c)</b>	Write the link state algorithm and apply it to the following graph with source node is 'A'		7 Marks

<b>OR</b>			
<b>Q.6</b>	<b>(a)</b>	With general format, explain various fields of IPv6.	6Marks
	<b>(b)</b>	List the broadcast routing algorithms. Explain any two of them	7Marks
	<b>(c)</b>	Explain the intra-AS routing protocol in detail	7Marks
<b>Module – 4</b>			
<b>Q.7</b>	<b>(a)</b>	What are the elements of network security? Explain the threats to network security.	8Marks
	<b>(b)</b>	Briefly explain the steps of DES algorithm.	6Marks
	<b>(c)</b>	Discuss about (i) Cryptographic techniques (ii) Authentication techniques	6Marks
<b>OR</b>			
<b>Q.8</b>	<b>(a)</b>	Explain RSA algorithm. Using RSA algorithm encrypt a message $m=9$ . Assume $p=3$ and $q=11$ . Find the public and private keys and also show the cipher text.	8Marks
	<b>(b)</b>	Discuss the Secure Hash Algorithm.	6Marks
	<b>(c)</b>	Write a note on firewalls.	6Marks
<b>Module – 5</b>			
<b>Q.9</b>	<b>(a)</b>	Briefly explain the properties of Audio and Video	8Marks
	<b>(b)</b>	List the categories of streaming of stored video. Explain any one of them	8Marks
	<b>(c)</b>	Explain the RTP protocol header fields	4Marks
<b>OR</b>			
<b>Q.10</b>	<b>(a)</b>	With neat diagram explain CDN operation	8Marks
	<b>(b)</b>	Discuss the following (i) Adaptive Streaming (ii) DASH	8Marks
	<b>(c)</b>	Give the limitations of best effort IP service	4Marks



Table showing the Bloom's Taxonomy Level, Course Outcome and Programme Outcome				
Question		Bloom's Taxonomy Level attached	Course Outcome	Programme Outcome
Q.1	(a)	L1	CO1	PO1,PO3
	(b)	L2	CO1	PO1,PO3
	(c)	L2	CO1	PO1, PO3
Q.2	(a)	L1	CO1	PO1, PO3
	(b)	L2	CO1	PO1, PO3
	(c)	L2	CO1	PO1, PO3
Q.3	(a)	L2	CO2	PO1,PO3,PO4
	(b)	L2	CO2	PO1,PO3,PO4
	(c)	L2	CO2	PO1,PO3,PO4
Q.4	(a)	L2	CO2	PO1,PO3,PO4
	(b)	L2	CO2	PO1,PO3,PO4
	(c)	L1	CO2	PO1,PO3,PO4
Q.5	(a)	L1	CO3	PO1,PO2,PO3
	(b)	L2	CO3	PO1,PO2,PO3
	(c)	L3	CO3	PO1,PO2,PO3
Q.6	(a)	L2	CO3	PO1,PO2,PO3
	(b)	L2	CO3	PO1,PO2,PO3
	(c)	L2	CO3	PO1,PO2,PO3
Q.7	(a)	L1	CO4	PO1,PO2,PO3
	(b)	L2	CO4	PO1,PO2,PO3
	(c)	L1	CO4	PO1,PO2,PO3
Q.8	(a)	L3	CO4	PO1,PO2,PO3
	(b)	L2	CO4	PO1,PO2,PO3
	(c)	L1	CO4	PO1,PO2,PO3
Q.9	(a)	L1	CO5	PO1,PO2,PO3
	(b)	L1	CO5	PO1,PO2,PO3
	(c)	L2	CO5	PO1,PO2,PO3
Q.10	(a)	L2	CO5	PO1,PO2,PO3
	(b)	L1	CO5	PO1,PO2,PO3
	(c)	L1	CO5	PO1,PO2,PO3
Bloom's Taxonomy Levels	<b>Lower order thinking skills</b>			
	Remembering( knowledge):L <sub>1</sub>	Understanding Comprehension): L <sub>2</sub>	Applying (Application): L <sub>3</sub>	
	<b>Higher order thinking skills</b>			
	Analyzing (Analysis): L <sub>4</sub>	Valuating (Evaluation): L <sub>5</sub>	Creating (Synthesis): L <sub>6</sub>	



**Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)**

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**Fifth Semester B.E. Degree Examination**  
**Computer Networks and Security**

**TIME: 03 Hours****Max. Marks: 100**

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.  
 02.  
 03.

<b>Module – 1</b>			<b>Marks</b>
<b>Q.1</b>	<b>(a)</b>	Differentiate between i) HTTP & FTP ii) SMTP & HTTP iii) UDP & TCP .	10
	<b>(b)</b>	Explain cookies and web caching with diagram.	10
<b>OR</b>			
<b>Q.2</b>	<b>(a)</b>	Discuss the working of Domain Name Service.	10
	<b>(b)</b>	Demonstrate client server socket programming application using TCP.	10
<b>Module – 2</b>			
<b>Q.3</b>	<b>(a)</b>	Illustrate TCP & UDP segment structure with a help of diagram.	10
	<b>(b)</b>	With a neat diagram, demonstrate the working of GO-BACK-N protocol.	10
<b>OR</b>			
<b>Q.4</b>	<b>(a)</b>	Describe TCP connection management with a help of diagram.	10
	<b>(b)</b>	Interpret the FSM of TCP congestion control.	10
<b>Module – 3</b>			
<b>Q.5</b>	<b>(a)</b>	With a help of neat diagram explain virtual circuit diagram and Datagram network.	6

	(b)	Explain router architecture.	6
	(c)	Illustrate the following i)IPv4 Addressing ii)IP fragmentation iii)Subnet Addressing	8
<b>OR</b>			
Q.6	(a)	Explain Dijkstra's algorithm with example.	10
	(b)	Explain various broadcast routing algorithms.	10
<b>Module – 4</b>			
Q.7	(a)	Explain Feistel structure of DES Algorithm.	10
	(b)	Explain RSA Algorithm with an example.	10
<b>OR</b>			
Q.8	(a)	Explain Diffie-Hellman Key-Exchange Protocol.	6
	(b)	With a help of neat diagram explain computation of SHA-1.	8
	(c)	Explain different types of Firewall.	6
<b>Module – 5</b>			
Q.9	(a)	Explain the properties of audio and video.	8
	(b)	With a help of neat diagram explain streaming stored video over HTTP/TCP.	6
	(c)	Explain CDN Operation.	6
<b>OR</b>			
Q.10	(a)	Explain Interleaving mechanism.	6
	(b)	Explain RTP Basics and RTP Packet.	6
	(c)	With a diagram, explain SIP call establishment.	8

Table showing the Bloom's Taxonomy Level, Course Outcome and Programme Outcome				
Question		Bloom's Taxonomy Level attached	Course Outcome	Programme Outcome
Q.1	(a)	$L_3$	CO1	PO1
	(b)	$L_2$	CO1	PO1
Q.2	(a)	$L_2$	CO1	PO1
	(b)	$L_3$	CO1	PO1
Q.3	(a)	$L_2$	CO2	PO2
	(b)	$L_2$	CO2	PO2
Q.4	(a)	$L_2$	CO2	PO2
	(b)	$L_3$	CO2	PO2
Q.5	(a)	$L_2$	CO3	PO2
	(b)	$L_2$	CO3	PO2
	(c)	$L_3$	CO3	PO2
Q.6	(a)	$L_2$	CO3	PO2
	(b)	$L_2$	CO3	PO2
Q.7	(a)	$L_2$	CO4	PO2
	(b)	$L_2$	CO4	PO2
Q.8	(a)	$L_2$	CO4	PO2
	(b)	$L_2$	CO4	PO2
	(c)	$L_2$	CO4	PO2
Q.9	(a)	$L_2$	CO5	PO2
	(b)	$L_2$	CO5	PO2
	(c)	$L_2$	CO5	PO2
Q.10	(a)	$L_2$	CO5	PO2
	(b)	$L_2$	CO5	PO2
	(c)	$L_2$	CO5	PO2
Bloom's Taxonomy Levels	<b>Lower order thinking skills</b>			
	Remembering(knowledge): $L_1$	Understanding Comprehension): $L_2$	Applying (Application): $L_3$	
	<b>Higher order thinking skills</b>			
	Analyzing (Analysis): $L_4$	Valuating (Evaluation): $L_5$	Creating (Synthesis): $L_6$	



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## Fifth Semester B.E. Degree Examination, June/July 2023 Computer Networks and Security

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Explain briefly about the network application architectures with neat diagram. (10 Marks)  
b. Explain the transport services provided by internet. (10 Marks)
- OR
- 2 a. Compare non persistent and persistent HTTP connections. (06 Marks)  
b. Explain importance of cookies and web caching with neat diagram. (08 Marks)  
c. Explain about DNS services. (06 Marks)

### Module-2

- 3 a. Explain about connection oriented multiplexing and de-multiplexing with a neat diagram. (10 Marks)  
b. Explain UDP connection-less transport protocol and briefly explain TCP-segment structure. (10 Marks)
- OR
- 4 a. Explain about Go-back-N and Selective repeat protocols with neat diagram. (10 Marks)  
b. Write a short note on TCP congestion control with fairness. (10 Marks)

### Module-3

- 5 a. Explain DHCP client server interaction with neat diagram. (07 Marks)  
b. Explain Network Address Translation (NAT) operations with neat diagram. (07 Marks)  
c. Explain ICMP with error message types. (06 Marks)
- OR
- 6 a. Discuss briefly four component functionalities of generic router architecture with neat diagram. (10 Marks)  
b. Explain BGP inter-AS routing protocol with a neat diagram. (10 Marks)

### Module-4

- 7 a. Briefly explain various threats of network security. (10 Marks)  
b. Explain R.S.A algorithm with suitable example. (10 Marks)
- OR
- 8 a. Explain Diffie-Hellman key-exchange algorithm with example. (10 Marks)  
b. Brief importance of Firewall in securing network with neat diagram. (10 Marks)

### Module-5

- 9 a. Explain 3 types of multimedia network applications with advantages. (10 Marks)  
b. Explain content distribution network operation with neat diagram. (10 Marks)
- OR
- 10 a. Explain Voice-Over-IP : (i) Packet-loss (ii) Packet-delay and (iii) Packet Jitter (10 Marks)  
b. Explain SIP protocol with neat diagram. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.





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## Fifth Semester B.E. Degree Examination, Jan./Feb. 2023 Computer Networks and Security

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Explain the use of cookie files in web applications. (06 Marks)
- b. With a neat diagram, explain how SMTP can be used for transmitting mails from sender to receiver. (08 Marks)
- c. Discuss the working of Bit Torrent for file distribution. (06 Marks)

OR

- 2 a. Differentiate between persistent and non persistent connections in HTTP. (05 Marks)
- b. In brief explain the conditional GET operation. (05 Marks)
- c. Describe the DNS records and messages in detail. (10 Marks)

### Module-2

- 3 a. In brief describe UDP segment structure and checksum computation. (06 Marks)
- b. With a neat diagram demonstrate the working of GO-BACK-N protocol. (08 Marks)
- c. Explain TCP flow control in detail. (06 Marks)

OR

- 4 a. With the help of a FSM, describe reliable data transfer in a Lossy channel with bit errors (rdt 3.0). (08 Marks)
- b. Explain the various fields of a TCP segment structure. (05 Marks)
- c. What are the approaches to congestion control? Explain in detail with example. (07 Marks)

### Module-3

- 5 a. Explain inter autonomous system routing with Border Gateway protocol. (08 Marks)
- b. Explain various Broadcast Routing algorithms. (08 Marks)
- c. Write a note on IGMP protocol. (04 Marks)

OR

- 6 a. Write the link state algorithm and apply it to the following graph. Assume node 'u' as the source node. (10 Marks)

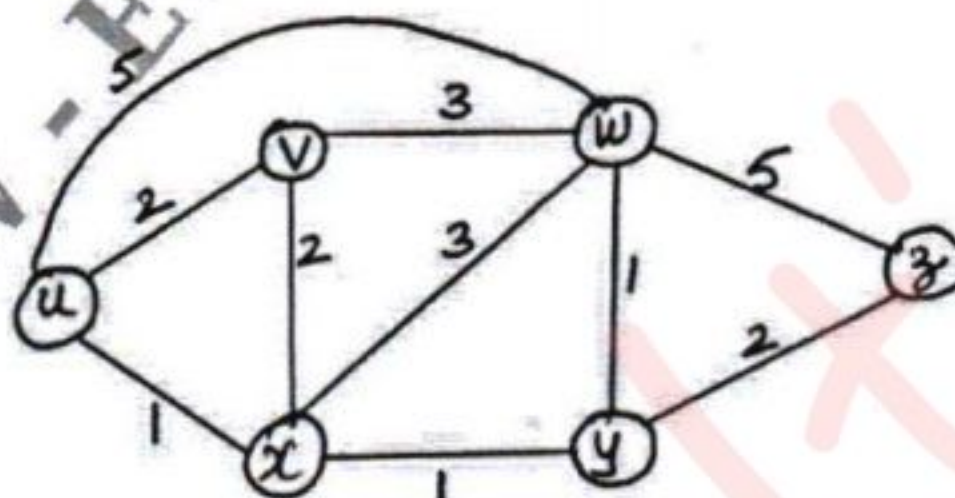


Fig.Q.6(a)

- b. Explain the architecture of a Router. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

**Module-4**

- 7 a. What are the elements of network security? Discuss the threats to network security. (10 Marks)
- b. Explain RSA algorithm. Using RSA encrypt a message  $m = 9$ . Assume  $p = 3$  and  $q = 11$ . Find the public key and private key, also show encryption and decryption. (10 Marks)

OR

- 8 a. Explain the working of DES algorithm. (08 Marks)
- b. Discuss the secure Hash Algorithm. (06 Marks)
- c. Write a note on firewalls. (06 Marks)

**Module-5**

- 9 a. Explain the types of multimedia network applications. (06 Marks)
- b. Briefly explain how DNS redirects a user request to a CDN server. (08 Marks)
- c. With a diagram, explain SIP call establishment. (06 Marks)

OR

- 10 a. What are the properties of video and audio? Explain in detail. (07 Marks)
- b. With a neat diagram, explain streaming stored video over HTTP. (07 Marks)
- c. Explain the Forward Error Correction (FEC) technique for loss anticipation in VoIP application. (06 Marks)

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