Register Number															

SRM Institute of Science and Technology
College of Engineering and Technology
School of Computing

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamil Nadu

Set - A

Academic Year: 2022-23 (ODD)

Test: CLA-T1 | Date: 07-09-2022
Course Code & Title: 18CSC302J – Computer Networks | Duration: 1 Hour
Year & Sem: III Year / V Sem | Max. Marks: 25

Course Articulation Matrix:

S.No.	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	CO1	1	3	-	3	1	-	-	-	1	1	-	3

Part – A
(15 x 1 = 15 Marks)

Instructions: 1) Answer ALL questions. 2) The duration for answering the part A is 15 minutes (this sheet will be collected after 15 minutes). 3) Encircle the correct answer (if more than one is right answer encircle appropriately) 4) if any of the questions * indicates choose multiple answers.

Q. No	Question	Marks	BL	CO	PO	PI Code
1	**There are the following statements that are given below, which of them are correct OP code used in ARP message format? *** a. the OP code is used to specify the type of ARP message. b. the OP code is part of only the ARP request message. c. the OP code 1 is used for ARP request. d. the OP code 0 is used for ARP reply.	1	L1	1	1	1.6.1
2	**Which of the following is correct about User Datagram Protocol** a. UDP has flow control mechanism b. There is window mechanism in UDP c. There is no robust error control mechanism in UDP d. UDP provides error correction	1	L1	1	1	1.6.1
3	**Size of TCP segment header ranges between _____** a. 16 and 32 bytes b. 16 and 32 bits c. 20 and 60 bytes d. 20 and 60 bits	1	L1	1	1	1.6.1
4	**During error reporting, ICMP always reports error messages to _____** a. Destination b. Source c. Next router d. Previous router	1	L1	1	1	1.6.1
5	**In the _____ algorithm of TCP, the size of the congestion window increases exponentially until it reaches a threshold.**	1	L1	1	1	1.6.1

	a. slow-start b. congestion avoidance c. congestion detection d. Congestion control					
6	**Transport layer aggregates data from different applications into a single stream before passing it to _____** a network layer b. data link layer c. application layer d. physical layer	1	L1	1	1	1.6.1
7	**UDP perform _____ functions.** a. end-to-end reliable data delivery b. process-to-process communication c. host-to-host communication d. host-to-server communication	1	L1	1	1	1.6.1
8	**_____ is a technique that refers to a congestion control mechanism in which a congested node stops receiving data from the immediate upstream node or nodes.** a. Backpressure b. Discard c. Choke d. Explicit	1	L1	1	1	1.6.1
9	**The _____ address, also known as the link address, is the address of a node as defined by its LAN or WAN.** a. Physical b. IP c. Port d. Specific	1	L1	1	1	1.6.1
10	**In IPv4, service type of service in header field, first 3 bits are called _____** a. Type of service b. Code bits c. Sync bits d. Precedence **bits**	1	L1	1	1	1.6.1

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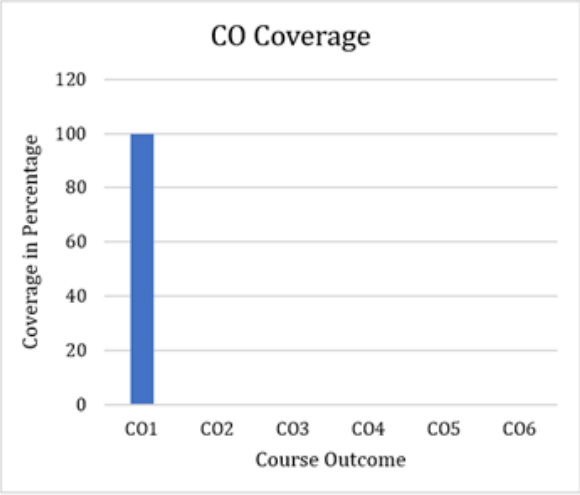
Test: CLA-T1 | Date: 07-09-2022
Course Code & Title: 18CSC302J – Computer Networks | Duration: 1 Hour
Year & Sem: III Year / V Sem | Max. Marks: 25

Part – B
(1 x 15 = 15 Marks)

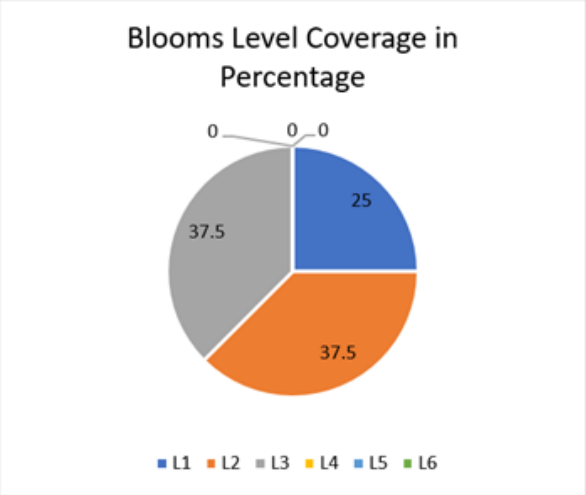
Instructions: Answer ANY One questions

Q. No	Question	Marks	BL	CO	PO	PI Code
11	**i) An IP packet has arrived in which the offset value is 100, the value of HLEN is 5 and the value of the total length field is 100. What is the number of the first byte and the last byte?**	5	L3	1	2	2.6.3
	ii) Explain TCP Connection establishment process in detail with a neat diagram	10	L2	1	1	1.6.1
	(OR)					
12	**i) List out the components of ARP packages and How the cache-control module is responsible for maintaining the cache table.**	5	L2	1	1	1.6.1
	ii) Calculate the checksum for the following IP packet: 4500 003c 1c46 4000 4006 b1e6 ac10 0a63 ac10 0a0c	10	L3	1	2	2.6.3

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions



CO1 – 100%



L1 – 25% (10 Marks)
L2 – 37.5% (15 Marks)
L3 – 37.5% (15 Marks)

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SET - A

Academic Year: 2022 - 2023 (ODD)

Test: CLA - T1 | **Date: 07-09-2022**
Course Code & Title: 18CSC302J – Computer Networks | **Duration:** 1 Hrs
Year & Sem: III / V | **Max. Marks:** 25

Course Articulation Matrix: ***(to be placed)***

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1	CO1	1	3	-	3	1	-	-	-	1	1	-	3

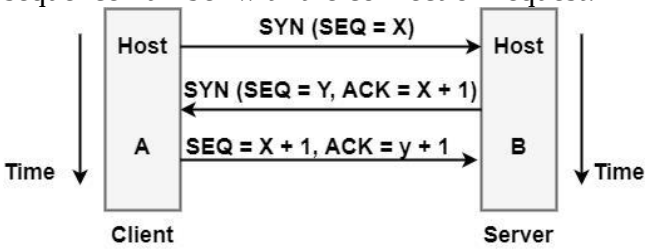
Part - A
(15 x 1 = 15 Marks)

Instructions: Answer all

Q. No	Answer with choice variable	Marks	BL	CO	PO	PI Code
1	**a. the OP code is used to specify the type of ARP message.** **c. the OP code 1 is used for ARP request.**	1	L1	1	1	1.6.1
2	**c. There is no robust error control mechanism in UDP**	1	L1	1	1	1.6.1
3	**c. 20 and 60 bytes**	1	L1	1	1	1.6.1
4	**b. Source**	1	L1	1	1	1.6.1
5	**a. slow-start**	1	L1	1	1	1.6.1
6	**a. network layer**	1	L1	1	1	1.6.1
7	**b. process-to-process communication**	1	L1	1	1	1.6.1
8	**a. Backpressure**	1	L1	1	1	1.6.1
9	**a. Physical**	1	L1	1	1	1.6.1
10	**d. Precedence bits**	1	L1	1	1	1.6.1

Part – B
(5 x 2 = 10 Marks)

11	**i) An IP packet has arrived in which the offset value is 100, the value of HLEN is 5 and the value of the total length field is 100. What is the number of the first byte and the last byte?** **Each step carry 1 marks** Total length = 100 HLEN = 5*4 =20 Data length = total length – HLEN = 100-20 = 80 First byte = 100 *8 =800 Last byte = 800 +80 -1 =879	5	L3	1	2	2.6.3
	ii) Explain TCP Connection establishment process in detail with a neat diagram. **Diagram: 3marks** **Explanation: 7 marks** The three handshakes are discussed in the below steps: Step 1: SYN SYN is a segment sent by the client to the server. It acts as a **connection request** between the client and server.	10	L2	1	1	1.6.1

	It informs the server that the client wants to establish a connection. Synchronizing sequence numbers also helps synchronize sequence numbers sent between any two devices, where the same SYN segment asks for the sequence number with the connection request.  Three way Handshake Step 2: SYN-ACK It is an SYN-ACK segment or an SYN + ACK segment sent by the server. The ACK segment informs the client that the server has received the connection request and it is ready to build the connection. The SYN segment informs the sequence number with which the server is ready to start with the segments. Step 3: ACK ACK (Acknowledgment) is the last step before establishing a successful TCP connection between the client and server. The ACK segment is sent by the client as the response of the received ACK and SN from the server. It results in the establishment of a reliable data connection. After these three steps, the client and server are ready for the data communication process. TCP connection and termination are full-duplex, which means that the data can travel in both the directions simultaneously.					
	OR					
12	**i) List out the components of ARP packages and How the cache-control module is responsible for maintaining the cache table.** **1marks for list of components** **4 marks for cache control module explanation** Address Resolution Protocol Package has five components: Cache table. Queues. Output module. Input module. Cache-control module. • The cache-control module maintains the cache table. It checks the cache table entry by entry periodically, i.e. five seconds. • If the state field of the entry is FREE, it checks another entry. • If the state field of the entry is PENDING, the cache-control module increases the attempt field's value by 1. It then checks the value of the attempt field. If the attempt field's value is greater than the maximum limit that is allowed, it updates the state field to FREE and destroys	5	L2	1	1	1.6.1

	the corresponding queue. If the state field of the entry is RESOLVED, the cache-control module decreases the time outfield value by 1. It then checks the value of the time outfield. If the time outfield value is less than or equal to zero, it updates the state field of entry to FREE and destroys the corresponding queue.					
	ii) Calculate the checksum for the following IP packet: **4500 003c 1c46 4000 4006 b1e6 ac10 0a63 ac10 0a0c** Initially checksum value initialized as 0 and find checksum 4500 -> 0 1 0 0 0 1 0 1 0 0 0 0 0 0 0 0 003c -> 0 0 0 0 0 0 0 0 0 0 1 1 1 1 0 0 1c46 -> 0 0 0 1 1 1 0 0 0 1 0 0 0 1 1 0 4000 -> 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 4006 -> 0 1 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0000 -> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 //checksum field ac10 -> 1 0 1 0 1 1 0 0 0 0 0 1 0 0 0 0 0a63 -> 0 0 0 0 1 0 1 0 0 1 1 0 0 0 1 1 ac10 -> 1 0 1 0 1 1 0 0 0 0 0 1 0 0 0 0 0a0c -> 0 0 0 0 1 0 1 0 0 0 0 0 1 1 0 0 24E17 - >1 0 0 1 0 0 1 1 1 0 0 0 0 1 0 1 1 1 SUM 4E19 - > 0 1 0 0 1 1 1 0 0 0 0 1 1 0 0 1 Sum+carry B1E6 -> 1 0 1 1 0 0 0 1 1 1 1 0 0 1 1 0 // IP Checksum **(OR)** Checksum value included in IP packet sequence solution becomes 4500 -> 0 1 0 0 0 1 0 1 0 0 0 0 0 0 0 0 003c -> 0 0 0 0 0 0 0 0 0 0 1 1 1 1 0 0 1c46 -> 0 0 0 1 1 1 0 0 0 1 0 0 0 1 1 0 4000 -> 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 4006 -> 0 1 0 0 0 0 0 0 0 0 0 0 0 1 1 0 b1e6 -> 1 0 1 1 0 0 0 1 1 1 1 0 0 1 1 0 //checksum field ac10 -> 1 0 1 0 1 1 0 0 0 0 0 1 0 0 0 0 0a63 -> 0 0 0 0 1 0 1 0 0 1 1 0 0 0 1 1 ac10 -> 1 0 1 0 1 1 0 0 0 0 0 1 0 0 0 0 0a0c -> 0 0 0 0 1 0 1 0 0 0 0 0 1 1 0 0 2EBF5 -> 1 0 1 1 1 0 1 0 1 1 1 1 1 1 0 1 0 1 SUM EBF7 -> 1 1 1 0 1 0 1 1 1 1 1 1 0 1 1 1 Sum+carry 1408 -> 0 0 0 1 0 1 0 0 0 0 0 0 1 0 0 0 complemented sum **Error occurs in above packet sequence** **If students done both give full mark** **If students any one either checksum calculation or verification**	10	L3	1	2	2.6.3

Question Paper Setter **Approved by Audit Professor/ Course Coordinator**

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Set - B

Academic Year: 2022-23 (ODD)

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Course Code & Title: 18CSC302J – Computer Networks | Duration: 1 Hour
Year & Sem: III Year / V Sem | Max. Marks: 25

Course Articulation Matrix:

S.No.	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	CO1	1	3	-	3	1	-	-	-	1	1	-	3

Part – A
(15 x 1 = 15 Marks)

Instructions: 1) Answer ALL questions. 2) The duration for answering the part A is 15 minutes (this sheet will be collected after 15 minutes). 3) Encircle the correct answer (if more than one is right answer encircle appropriately) 4) if any of the questions * indicates choose multiple answers.

Q. No	Question	Marks	BL	CO	PO	PI Code
1	**How many bytes are reserved for target hardware address in ARP message format?** a. 4 bytes b. 6 bytes c. 8 bytes d. 16 bytes	1	L1	1	1	1.6.1
2	**The transport layer protocol used for real time multimedia, file transfer, e-mail and DNS respectively are** a. UDP,TCP,TCP and UDP b. TCP,UDP,UDP and TCP c. UDP,TCP,TCP AND UDP d. TCP,UDP,TCP AND UDP	1	L1	1	1	1.6.1
3	**Connection establishment in TCP is done by which mechanism?** a. Flow control b. Three-Way Handshaking c. Forwarding d. Synchronization	1	L1	1	1	1.6.1
4	**Which of these is not a type of error-reporting message?** a. Destination unreachable b. Source quench c. Router error d. Time exceeded	1	L1	1	1	1.6.1
5	**To accomplish flow control, TCP uses a _____ window protocol.** a. limited-size b. sliding c. fixed-size	1	L1	1	1	1.6.1

	d. variable					
6	**Which of the following is false with respect to UDP?** a. Connection-oriented b. Unreliable c. Transport layer protocol d. Low overhead	1	L1	1	1	1.6.1
7	**The value of acknowledgement field in a segment defines _____** a. sequence number of the byte received previously b. total number of bytes to receive c. sequence number of the next byte to be received d. sequence of zeros and ones	1	L1	1	1	1.6.1
8	**In case of time exceeded error, when the datagram visits a router, the value of time to live field is _____** a. Remains constant b. Decremented by 2 c. Incremented by 1 d. Decremented by 1	1	L1	1	1	1.6.1
9	**Which field helps to check rearrangement of the fragments?** a. offset b. flag c. ttl d. identifier	1	L1	1	1	1.6.1
10	**In IPv4 layer, datagram is of _____** a. Fixed length b. Variable length c. Global length d. Zero length	1	L1	1	1	1.6.1

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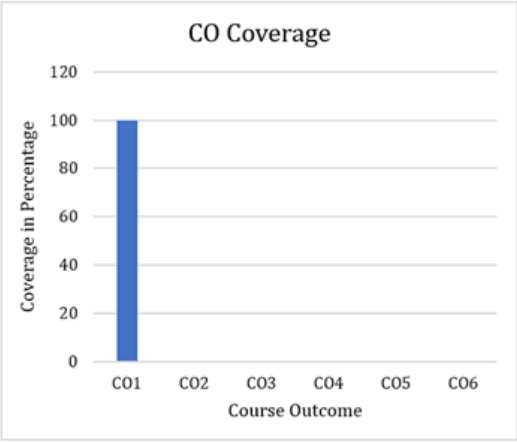
Course Code & Title: 18CSC302J – Computer Networks | Duration: 1 Hour
Year & Sem: III Year / V Sem | Max. Marks: 25

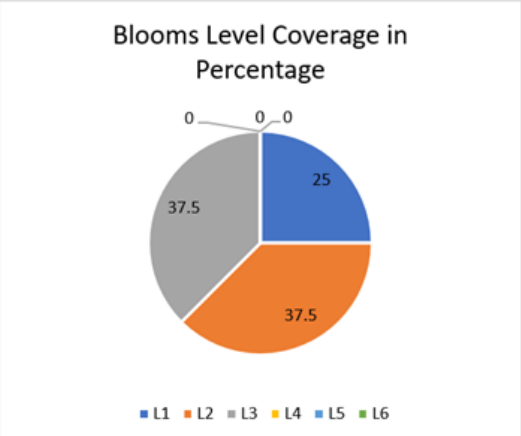
Part – B
(1 x 15 = 15 Marks)
Instructions: Answer ANY One questions

Q. No	Question	Marks	BL	CO	PO	PI Code
11	**i) An IP datagram is carrying 1024 bytes of data. If there is no option information, what is the value of the header length field? What is the value of the total length field?**	5	L3	1	2	2.6.3
	ii) With a neat diagram Illustrate the various fields in TCP Header	10	L2	1	1	1.6.1
	(OR)					
12	**i) Brief about how error control mechanism is achieved through retransmission of segments.**	5	L2	1	1	1.6.1
	ii) Calculate the checksum for the following ICMP packet: Type: Echo Request Identifier : 123 Sequence number : 20 Message : COMPUTING	10	L3	1	2	2.6.3

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions



CO1 – 100%



L1 – 25% (10 Marks)
L2 – 37.5% (15 Marks)
L3 – 37.5% (15 Marks)

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SET - B

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1	CO1	1	3	-	3	1	-	-	-	1	1	-	3

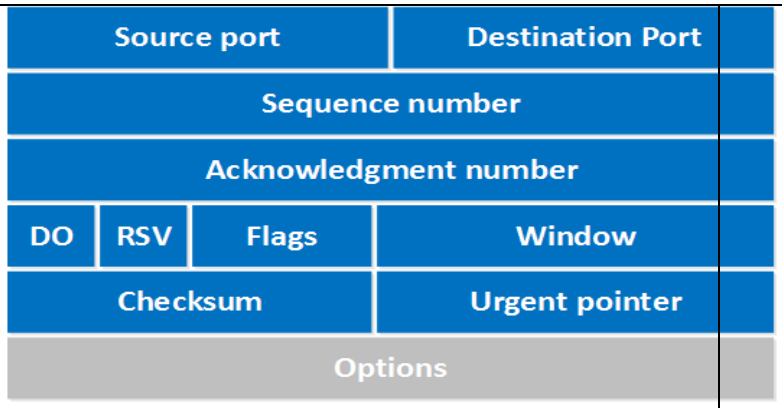
Part - A
(15 x 1 = 15 Marks)

Instructions: Answer all

Q. No	Answer with choice variable	Marks	BL	CO	PO	PI Code
1	**b. 6 bytes**	1	L1	1	1	1.6.1
2	**a. UDP,TCP,TCP and UDP**	1	L1	1	1	1.6.1
3	**b. Three-Way Handshaking**	1	L1	1	1	1.6.1
4	**c. Router error**	1	L1	1	1	1.6.1
5	**b. sliding**	1	L1	1	1	1.6.1
6	**a. Connection-oriented**	1	L1	1	1	1.6.1
7	**c. sequence number of the next byte to be received**	1	L1	1	1	1.6.1
8	**d. Decremented by 1**	1	L1	1	1	1.6.1
9	**a. offset**	1	L1	1	1	1.6.1
10	**b. Variable length**	1	L1	1	1	1.6.1

Part – B
(5 x 2 = 10 Marks)

11	**i) An IP datagram is carrying 1024 bytes of data. If there is no option information, what is the value of the header length field? What is the value of the total length field?** Data-size = 1024 bytes. Header-size = 20 bytes (since no option bytes present) HLEN = 20/4 = 5. Total length of datagram = 1024 + 20 = 1044 bytes	5	L3	1	2	2.6.3
	ii) With a neat diagram Illustrate the various fields in TCP Header. **Diagram: 3 marks** **Explanation: 7 marks** Let's walk through all these fields: Source port: this is a 16 bit field that specifies the port number of the sender. Destination port: this is a 16 bit field that specifies the port number of the receiver. Sequence number: the sequence number is a 32 bit field that indicates how much data is sent during the TCP session.	10	L2	1	1	1.6.1

	 Acknowledgment number: this 32 bit field is used by the receiver to request the next TCP segment. This value will be the sequence number incremented by 1. DO: this is the 4 bit data offset field, also known as the header length. It indicates the length of the TCP header so that we know where the actual data begins. RSV: these are 3 bits for the reserved field. They are unused and are always set to 0. Flags: there are 9 bits for flags, we also call them control bits. We use them to establish connections, send data and terminate connections: URG: urgent pointer. When this bit is set, the data should be treated as priority over other data. ACK: used for the acknowledgment. PSH: this is the push function. This tells an application that the data should be transmitted immediately and that we don't want to wait to fill the entire TCP segment. RST: this resets the connection, when you receive this you have to terminate the connection right away. This is only used when there are unrecoverable errors and it's not a normal way to finish the TCP connection. SYN: we use this for the initial three way handshake and it's used to set the initial sequence number. FIN: this finish bit is used to end the TCP connection. TCP is full duplex so both parties will have to use the FIN bit to end the connection. This is the normal method how we end an connection. Window: the 16 bit window field specifies how many bytes the receiver is willing to receive. Checksum: 16 bits are used for a checksum to check if the TCP header is OK or not. Urgent pointer: these 16 bits are used when the URG bit has been set, the urgent pointer is used to indicate where the urgent data ends. Options: this field is optional and can be anywhere between 0 and 320 bits.					
	OR					
12	**i) Brief about how error control mechanism is achieved through retransmission of segments.** **Retransmission –** When a segment is missing, delayed to deliver to a receiver, corrupted when it is	5	L2	1	1	1.6.1

	checked by the receiver then that segment is retransmitted again. Segments are retransmitted only during two events: when the sender receives three duplicate acknowledgements (ACK) or when a retransmission timer expires. 1. **Retransmission after RTO:** TCP always preserves one retransmission time-out (RTO) timer for all sent but not acknowledged segments. RTT is the time duration needed for a segment to reach the receiver and an acknowledgement to be received by the sender. 2. **Retransmission after Three duplicate ACK segments:** RTO method works well when the value of RTO is small. If it is large, more time is needed to get confirmation about whether a segment has been delivered or not. Sometimes one segment is lost and the receiver receives so many out-of-order segments that they cannot be saved. In order to solve this situation, three duplicate acknowledgement method is used and missing segment is retransmitted immediately instead of retransmitting already delivered segment. This is a fast retransmission because it makes it possible to quickly retransmit lost segments instead of waiting for timer to end.					
	ii) Calculate the checksum for the following ICMP packet: Type: Echo Request **Identifier : 123** **Sequence number : 20** **Message : COMPUTING** 8 and 0 -> 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 -> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 // Checksum value 123 -> 0 0 0 0 0 0 0 0 0 1 1 1 1 0 1 1 20 -> 0 0 0 0 0 0 0 0 0 0 0 1 0 1 0 0 C&O -> 0 1 0 0 0 0 1 1 0 1 0 0 1 1 1 1 M&P -> 0 1 0 0 1 1 0 1 0 1 0 1 0 0 0 0 U&T -> 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 0 I&N -> 0 1 0 0 1 0 0 1 0 1 0 0 1 1 1 0 G&Pad-> 0 1 0 0 0 1 1 1 0 0 0 0 0 0 0 0 7AD0 -> 0 1 1 1 1 0 1 0 1 1 0 1 0 0 0 0 // SUM 852F -> 1 0 0 0 0 1 0 1 0 0 1 0 1 1 1 1 // Checksum	10	L3	1	2	2.6.3

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Set - C

Academic Year: 2022-23 (ODD)

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Part - A
(15 x 1 = 15 Marks)

Instructions: 1) Answer ALL questions. 2) The duration for answering the part A is 15 minutes (this sheet will be collected after 15 minutes). 3) Encircle the correct answer (if more than one is right answer encircle appropriately) 4) if any of the questions * indicates choose multiple answers.

Q. No	Question	Marks	BL	CO	PO	PI Code
1	**Which of the following number is assigned for IPv4 in the protocol type field of ARP message format?** A. 0x400 B. 0x100 C. 0x800 D. 0x200	1	L1	1	1	1.6.1
2	**In socket programming, the sequence of the system calls used in the UDP echo server at the server side** (i) sendto() (ii) recvfrom() (iii) socket() (iv) bind() a. (iii),(iv),(ii),(i) b. (ii),(iv),(iii),(i) c. (i),(iii),(ii),(i) d. (iii),(iv),(i),(ii)	1	L1	1	1	1.6.1
3	**In Three-Way Handshaking process, the situation where both the TCP's issue an active open is** _____ a. Mutual open b. Mutual Close c. Simultaneous open d. Simultaneous close	1	L1	1	1	1.6.1
4	**When a router cannot route a datagram or host cannot deliver a datagram, the datagram is discarded and the router or the host sends a _____ message back to the source host that initiated the datagram.** a. Destination unreachable b. Source quench c. Router error d. Time exceeded	1	L1	1	1	1.6.1

5	**In the congestion avoidance algorithm, the size of the congestion window increases _____ until congestion is detected.** a. exponentially b. additively c. multiplicatively d. suddenly	1	L1	1	1	1.6.1
6	**Beyond IP, UDP provides additional services such as _____** a. Routing and switching b. Sending and receiving of packets c. Multiplexing and demultiplexing d. Demultiplexing and error checking	1	L1	1	1	1.6.1
7	**UDP length = _____ – IP header's length** a. IP length b. Total length c. Packet Header length d. UDP length	1	L1	1	1	1.6.1
8	**A bit can be set in a packet moving in the direction opposite to the congestion is called _____.** a. Implicit Signaling b. Explicit Signaling c. Backward Signaling d. Forward Signaling	1	L1	1	1	1.6.1
9	**The TTL field has value 10. How many routers (max) can process this datagram?** a. 11 b. 5 c. 10 d. 1	1	L1	1	1	1.6.1
10	**Which of these is not a type of error-reporting message?** a. Destination unreachable b. Source quench c. Router error d. Time exceeded	1	L1	1	1	1.6.1

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College of Engineering and Technology
School of Computing

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamil Nadu

Set - C

Academic Year: 2022-23 (ODD)

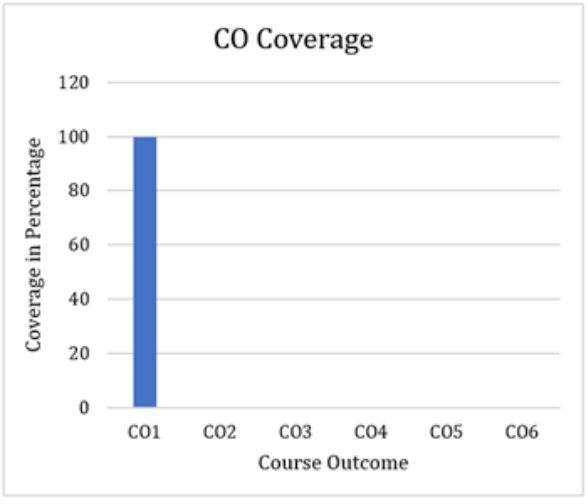
Test: CLA-T1 | Date: 07-09-2022
Course Code & Title: 18CSC302J – Computer Networks | Duration: 1 Hour
Year & Sem: III Year / V Sem | Max. Marks: 25

Part – B
(1 x 15 = 15 Marks)

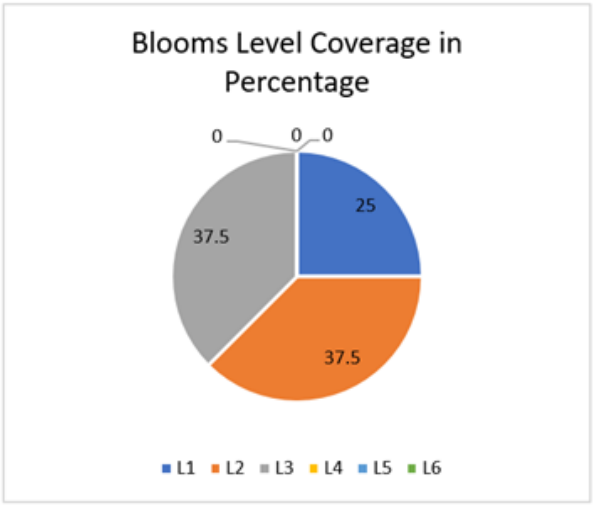
Instructions: Answer ANY One questions

Q. No	Question	Marks	BL	CO	PO	PI Code
11	**i) An IP packet has arrived in which the offset value is 200, the value of HLEN is 5 and the value of the total length field is 100. What is the number of the first byte and the last byte?**	5	L3	1	2	2.6.3
	ii) Describe about the error-reporting messages and query messages.	10	L2	1	1	1.6.1
	(OR)					
12	**i) Write short notes on Silly Window Syndrome in TCP flow control.**	5	L2	1	1	1.6.1
	ii) How do I calculate the checksum for a sample IPv4 packet received like this: 4500 062A 42A1 8001 4210 XXXX C0A8 0001 C0A8 0003 Where xxxx is the checksum that needs to be sent with the packet.	10	L3	1	2	2.6.3

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions



CO1 – 100%



L1 – 25% (10 Marks)
L2 – 37.5% (15 Marks)
L3 – 37.5% (15 Marks)

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Course Articulation Matrix: ***(to be placed)***

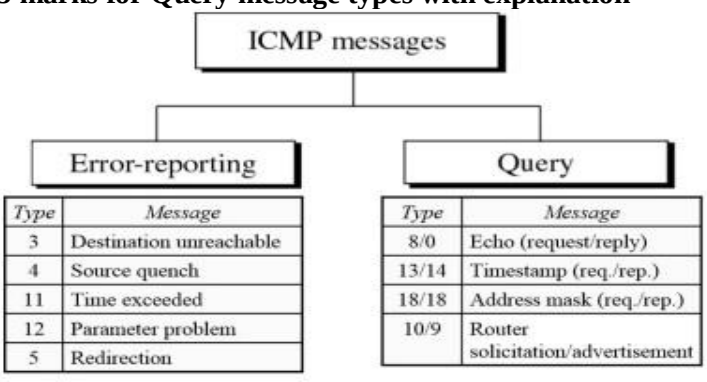
S.No.	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	CO1	1	3	-	3	1	-	-	-	1	1	-	3

Part - A
(15 x 1 = 15 Marks)

Instructions: Answer all

Q. No	Answer with choice variable	Marks	BL	CO	PO	PI Code
1	**C. 0x800**	1	L1	1	1	1.6.1
2	**d. (iii),(iv),(i),(ii)**	1	L1	1	1	1.6.1
3	**c. Simultaneous open**	1	L1	1	1	1.6.1
4	**a. Destination unreachable**	1	L1	1	1	1.6.1
5	**b. additively**	1	L1	1	1	1.6.1
6	**d. Demultiplexing and error checking**	1	L1	1	1	1.6.1
7	**a. IP length**	1	L1	1	1	1.6.1
8	**c. Backward Signaling**	1	L1	1	1	1.6.1
9	**c. 10**	1	L1	1	1	1.6.1
10	**c. Router error**	1	L1	1	1	1.6.1

Part – B
(5 x 2 = 10 Marks)

11	**i) An IP packet has arrived in which the offset value is 200, the value of HLEN is 5 and the value of the total length field is 100. What is the number of the first byte and the last byte?** **Each step carry 1 marks** Total length = 200 HLEN = 5*4 =20 Data length = total length – HLEN = 200-20 = 180 First byte = 100 *8 =800 Last byte = 800 + 180 -1 =979	5	L3	1	2	2.6.3
	ii) Describe about the error-reporting messages and query messages. **5marks for error reporting message types with explanation** **5 marks for Query message types with explanation**  *Type* / *Message*: 3 Destination unreachable; 4 Source quench; 11 Time exceeded; 12 Parameter problem; 5 Redirection *Type* / *Message*: 8/0 Echo (request/reply); 13/14 Timestamp (req./rep.); 18/18 Address mask (req./rep.); 10/9 Router solicitation/advertisement	10	L2	1	1	1.6.1

	OR					
12	**i) Write short notes on Silly Window Syndrome in TCP flow control.** **Silly Window Syndrome** is a problem that arises due to poor implementation of TCP. It degrades the TCP performance and makes the data transmission extremely inefficient. The problem is called so because: 1. It causes the sender window size to shrink to a silly value. 2. The window size shrinks to such an extent that the data being transmitted is smaller than TCP Header. The two major causes of this syndrome are as follows: 1. Sender window transmitting one byte of data repeatedly. 2. Receiver window accepting one byte of data repeatedly.	5	L2	1	1	1.6.1
	ii) How do I calculate the checksum for a sample IPv4 packet received like this: **4500 062A 42A1 8001 4210 XXXX C0A8 0001 C0A8 0003** **Where xxxx is the checksum that needs to be sent with the packet.** 4500 : 0 1 0 0 0 1 0 1 0 0 0 0 0 0 0 0 062A: 0 0 0 0 0 1 1 0 0 0 1 0 1 0 1 0 42A1: 0 1 0 0 0 0 1 0 1 0 1 0 0 0 0 1 8001: 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 4210: 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 0000: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 //Checksum field C0A8: 1 1 0 0 0 0 0 0 1 0 1 0 1 0 0 0 0001: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 C0A8: 1 1 0 0 0 0 0 0 1 0 1 0 1 0 0 0 0003: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 2D130: 10 1101 0001 0011 0000 //sum D132: 1101 0001 0011 0010 // sum 2ECD: 0010 1110 1100 1101 //checksum	10	L3	1	2	2.6.3

Question Paper Setter

Approved by Audit Professor/ Course Coordinator

*** Performance Indicators are available separately for Computer Science and Engineering in AICTE examination reforms policy.**

Register Number															

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Set - D

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Year & Sem: III Year / V Sem | Max. Marks: 25

Course Articulation Matrix:

S.No.	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	CO1	1	3	-	3	1	-	-	-	1	1	-	3

Part - A
(15 x 1 = 15 Marks)

Instructions: 1) Answer ALL questions. 2) The duration for answering the part A is 15 minutes (this sheet will be collected after 15 minutes). 3) Encircle the correct answer (if more than one is right answer encircle appropriately) 4) if any of the questions * indicates choose multiple answers.

Q. No	Question	Marks	BL	CO	PO	PI Code
1	**What command allows a user to view the ARP cache, and to add and delete entries?** a. ping b. ifconfig c. arp d. cp	1	L1	1	1	1.6.1
2	**What is the size of UDP header in bit?** a. 20 b.64 c.40 d. 8	1	L1	1	1	1.6.1
3	**The sizes of source and destination port address in TCP header are _____ respectively.** a. 16-bits and 32-bits b. 16-bits and 16-bits c. 32-bits and 16-bits d. 32-bits and 32-bits	1	L1	1	1	1.6.1
4	**Two machines can use the timestamp request and timestamp replay messages to determine the _____ needed for an IP datagram to travel between them.** a. Half-trip time b. Round-trip time c. Travel time for the next router d. Time to reach the destination/source	1	L1	1	1	1.6.1
5	**The packet sent by a node to the source to inform it of congestion is called _____ options** a. Explicit b. Discard c. Choke d. Backpressure	1	L1	1	1	1.6.1
6	**The port number is "ephemeral port number", if the source host is _____** a. NTP b. Echo	1	L1	1	1	1.6.1

	c. Server d. Client					
7	**What allows TCP to detect lost segments and in turn recover from that loss?** a. Sequence number b. Acknowledgment number c. Checksum d. Both Sequence & Acknowledgment number	1	L1	1	1	1.6.1
8	**During debugging, we can use the _____ program to find if a host is alive and responding.** a. traceroute b. shell c. ping d. java	1	L1	1	1	1.6.1
9	**ICMP error message will not be generated for a datagram having a special address such as _____** a. 12.1.2.2 b. 11.1 c. 127 d. 127.0.0.0	1	L1	1	1	1.6.1
10	**Port number used by Network Time Protocol (NTP) with UDP is _____** a. 161 b. 123 c. 162 d. 124	1	L1	1	1	1.6.1

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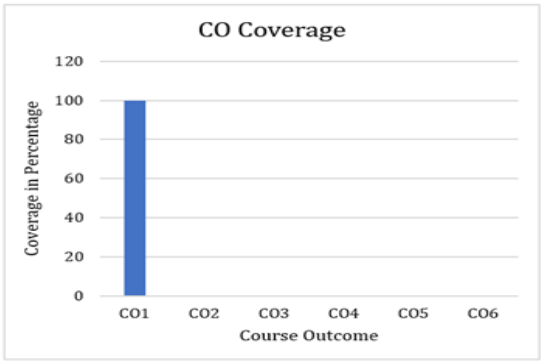
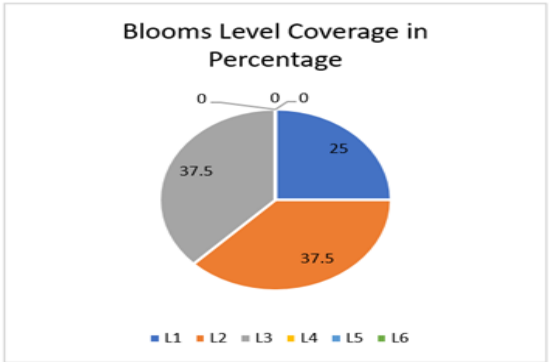
Part – B
(1 x 15 = 15 Marks)
Instructions: Answer ANY One questions

Q. No	Question	Marks	BL	CO	PO	PI Code
11	**i) An IP datagram is carrying 2048 bytes of data. If there is no option information, what is the value of the header length field? What is the value of the total length field?**	5	L3	1	2	2.6.3
	ii) With a neat diagram Illustrate the various fields in ARP Header	10	L2	1	1	1.6.1
	(OR)					
12	**i) write short notes on Error control in TCP and show how it is achieved through the use of three simple tools**	5	L2	1	1	1.6.1
	ii) Calculate the checksum for the following UDP packet: **Source IP: 153.18.8.105** **Destination IP: 171.2.14.10** **Reserve bytes: 0** **Protocol: 17** **UDP pseudo header total length: 15** **Source port address:1087** **Destination port address:13** **UDP header length:15** **Checksum: Initial** **Message : TESTING**	10	L3	1	2	2.6.3

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions



CO1 – 100%



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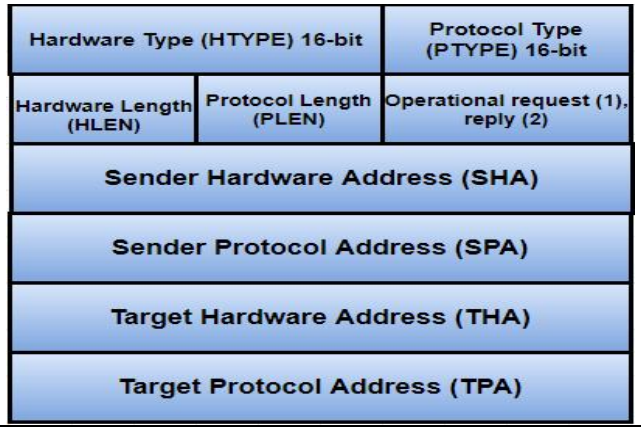
Part - A
(15 x 1 = 15 Marks)

Instructions: Answer all

Q. No	Answer with choice variable	Marks	BL	CO	PO	PI Code
1	**c. arp**	1	L1	1	1	1.6.1
2	**b.64**	1	L1	1	1	1.6.1
3	**b. 16-bits and 16-bits**	1	L1	1	1	1.6.1
4	**b. Round-trip time**	1	L1	1	1	1.6.1
5	**c. Choke**	1	L1	1	1	1.6.1
6	**d. Client**	1	L1	1	1	1.6.1
7	**b. Acknowledgment number**	1	L1	1	1	1.6.1
8	**c. ping**	1	L1	1	1	1.6.1
9	**d. 127.0.0.0**	1	L1	1	1	1.6.1
10	**b. 123**	1	L1	1	1	1.6.1

Part – B
(5 x 2 = 10 Marks)

11	i) **An IP datagram is carrying 2048 bytes of data. If there is no option information, what is the value of the header length field? What is the value of the total length field?** Data-size = 2048 bytes. Header-size = 20 bytes HLEN = 20/4 = 5. Total length of datagram = 2048 + 20 = 2068 bytes	5	L3	1	2	2.6.3
	ii) **With a neat diagram Illustrate the various fields in ARP Header. Diagram: 3marks** **Explanation: 7marks** • **Hardware Type–**It is 1 for Ethernet. • **Protocol Type–**It is a protocol used in the network layer. • **Hardware Address Length–**It is the length in bytes so that it would be 6 for Ethernet. • **Protocol Address Length** – Its value is 4 bytes. • **Operation Code** indicates that the packet is an ARP Request (1) or an ARP Response (2).	10	L2	1	1	1.6.1

	• **Senders Hardware Address** – It is a hardware address of the source node. • **Senders Protocol Address** -It is a layer 3 address of the source node. • **Target Hardware Address** – It is used in a RARP request, which response impact both the destination's hardware and layer 3 addresses. **Target Protocol Address** – It is used in an ARP request when the response carries both layer 3 addresses and the destination's hardware. 					
	OR					
12	**i) write short notes on Error control in TCP is achieved through the use of three simple tools** Error control also includes a mechanism for correcting errors after they are detected. Error detection and correction in TCP is achieved through the use of three simple tools: checksum, acknowledgment, and time-out. ***Checksum:*** Each segment includes a checksum field which is used to check for a corrupted segment. ***Acknowledgment:*** TCP uses acknowledgments to confirm the receipt of data segments. ***Retransmission:*** The heart of the error control mechanism is the retransmission of segments. When a segment is corrupted, lost, or delayed, it is retransmitted.	5	L2	1	1	1.6.1
	ii) Calculate the checksum for the following UDP packet: **Source IP: 153.18.8.105** **Destination IP: 171.2.14.10** **Reserve bytes: 0** **Protocol: 17** **UDP pseudo header total length: 15** **Source port address:1087** **Destination port address:13** **UDP header length:15** **Checksum: Initial** **Message : TESTING**	10	L3	1	2	2.6.3

	153 & 18: 1 0 0 1 1 0 0 1 0 0 0 1 0 0 1 0 08& 105: 0 0 0 0 1 0 0 0 0 1 1 0 1 0 0 1 171 & 2 : 1 0 1 0 1 0 1 1 0 0 0 0 0 0 1 0 14 & 10 : 0 0 0 0 1 1 1 0 0 0 0 0 1 0 1 0 0 &17 : 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 1 15 : 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1087 : 0 0 0 0 0 1 0 0 0 0 1 1 1 1 1 1 13 : 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 1 15 : 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 0 : 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 T & E : 0 1 0 1 0 1 0 0 0 1 0 0 0 1 0 1 S & T : 0 1 0 1 0 0 1 1 0 1 0 1 0 1 0 0 I & N : 0 1 0 0 1 0 0 1 0 1 0 0 1 1 1 0 G & Pad: 0 1 0 0 0 1 1 1 0 0 0 0 0 0 0 0 SUM : 1 0 0 1 0 1 1 0 1 1 1 0 1 0 1 1 Checksum: 0 1 1 0 1 0 0 1 0 0 0 1 0 1 0 0					

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