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B.Tech DEGREE EXAMINATION, JUNE 2024

Fifth Semester

18CSC302J - COMPUTER NETWORKS

(For the candidates admitted during the academic year 2018-2019 to 2021-2022)

Note:

i. **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.

ii. **Part - B** and **Part - C** should be answered in answer booklet.

Time: 3 Hours **Max. Marks: 100**

PART - A (20 × 1 = 20 Marks) — Answer **all** Questions

		Marks	BL	CO
1.	What is the maximum size of an IP packet, including the header and data, that can be transmitted without fragmentation in an IPv4 network? (A) 64 KB (B) 1280 bytes (C) 1500 bytes (D) 10 MB	1	2	1
2.	Which protocol is connectionless and does not guarantee message delivery? (A) TCP (B) UDP (C) ICMP (D) ARP	1	1	1
3.	ARP (Address Resolution Protocol) is used to: (A) Map IP addresses to MAC addresses (B) Map MAC addresses to IP addresses (C) Map domain names to IP addresses (D) Map subnet masks to IP addresses	1	1	1
4.	STCP allows _____ service in each association. (A) Single stream (B) Multistream (C) Double stream (D) None of the above	1	1	1
5.	If error occurs in the data transfer between the client and the server, the send and receive function will return (A) 0 (B) 1 (C) -1 (D) 0 or 1	1	1	2
6.	RPC works between two processes. These processes must be _____ (A) on the same computer (B) on different computers connected with a network (C) on the same computer and also on different computers connected with a network (D) on none of the computers	1	1	2
7.	In the process of fetching a web page from a server , the HTTP request/response takes (A) 2 RTT (B) 1 RTT (C) 4 RTT (D) 3 RTT	1	1	2
8.	Intel follows _____ type of ordering to store the data. (A) Both Little and Big Endian (B) Little or Big Endian (C) Big Endian (D) Little Endian	1	1	2
9.	In a connection, the value of cwnd is 4000 and the value of rwnd is 5000. The host has sent 1,000 bytes, which have not been acknowledged. How many more bytes can be sent? (A) 4000 (B) 1000 (C) 2000 (D) 3000	1	1	3

10.	The FIN + ACK segment consumes _____ sequence number if it does not carry data. (A) 0 (B) 1 (C) 2 (D) 3	1	1	3
11.	Which of the following statement is wrong? (A) client-server program (B) telnet lets user access an application on a remote computer (C) telnet can also be used for file transfer (D) telnet can be used for remote login	1	1	3
12.	The port number _____ and _____is used for data and control connection. (A) 21, 20 (B) 20,21 (C) 20,12 (D) 12,21	1	1	3
13.	What is the primary reason for the development and deployment of IPv6? (A) To provide backward compatibility with IPv4 (B) To accommodate the increasing number of devices and addresses (C) To improve routing algorithms (D) To enhance data transmission speeds	1	1	4
14.	The size of IPv6 address is _____. (A) 32 bits (B) 128 bits (C) 64 bits (D) 256 bits	1	1	4
15.	The number of subnets in a network increases with the (A) increased in netid (B) increase in hostid (C) no change in netid (D) no change in hostid	1	1	4
16.	In IPv6, which feature allows for stateless address configuration? (A) DHCPv6 (Dynamic Host Configuration Protocol version 6) (B) ARP (Address Resolution Protocol) (C) SLAAC (Stateless Address Autoconfiguration) (D) NAT66 (Network Address Translation for IPv6)	1	1	4
17.	Which IPv6 address type is used for communication within the same subnet or link? (A) Unicast address (B) Multicast address (C) Anycast address (D) Broadcast address	1	1	5
18.	In point to point Protocol the framing technique is done according to the (A) Bit Oriented Protocol (B) Byte Oriented Protocol (C) High-level Data link Protoco (D) link Control Protocol	1	1	5
19.	Which Layer does MPLS Work on? (A) It functions in layer 2 (B) It functions between layers 2 and 3 (C) It functions between layers 1 and 2 (D) It functions in layer 3	1	1	5
20.	The existing local loops with Asymmetric Digital Subscriber Line (ADSL) can handle band widths up to _____. (A) 1.1 Hz (B) 1.1 kHz (C) 1.1 MHz (D) 1.1GHz	1	1	5

PART - B (5 × 4 = 20 Marks)

Answer **any 5** Questions

		Marks	BL	CO
21.	List out the components of ARP packages and How the cache-control module is responsible for maintaining the cache table.	4	2	1
22.	You are a network engineer managing a critical data transfer application that uses TCP for communication. During a recent transmission, the sender noticed that a few packets were lost in the network. Explain how TCP Error Control mechanisms work to handle such packet losses and ensure reliable data delivery.	4	3	2

23.	Explain the structure of a socket and how the socket interface provides a communication channel for sending and receiving messages in your chat application. Describe the essential functions used to establish and manage the socket connection.	4	3	2
24.	Detail the features and advantages of the RPC model in facilitating communication between distributed components. Explain how you would implement features like marshalling, stubs, and parameter passing in the context of your finance application.	4	3	3
25.	Explain the role of the Domain Name System (DNS) in enabling global internet connectivity for your multinational corporation. Discuss the hierarchical nature of DNS and how it helps resolve domain names across different countries efficiently.	4	3	4
26.	Discuss the motivation behind the development and deployment of IPv6, and explain the need for a new Internet Protocol version.	4	3	4
27.	Provide an overview of HDLC frames, highlight its key features.	4	2	5

PART - C (5 × 12 = 60 Marks)

Answer **all** Questions

		Marks	BL	CO
28.	(a) Calculate the checksum for the following ICMP packet: Type: Echo Request Identifier : 123 Sequence number : 20 Message : COMPUTING	12	4	1
	(OR)			
	(b) Calculate the checksum for the following IP packet: 4500 003c 1c46 4000 4006 b1e6 ac10 0a63 ac10 0a0c			
29.	(a) Implement a client - server user-level application using sockets API in C/C++. The Server application has to support at least five clients simultaneously. Server accepts strings from clients (even multiple strings from each client) and replies with reverse strings. For example, when client sends "NAME", Server replies with "EMAN". Both server and client(s) have to output both sending & receiving strings on the terminal.	12	3	2
	(OR)			
	(b) Imagine you are a lead developer working on a project that involves developing a distributed system for an e-commerce platform. The system needs to handle various functionalities such as user authentication, inventory management, and order processing. The team has opted to use a Remote Procedure Call (RPC) model to facilitate communication between the different services in the distributed architecture.			
30.	(a) Explain how DNS operates on the internet, focusing on DNS resolution and the structure of DNS messages.	12	3	3
	(OR)			
	(b) Discuss the differences between various file transfer protocols and the architecture of the World Wide Web (WWW).			
31.	(a) Explain in detail the various IPv6 addressing modes. Discuss how each addressing mode is utilized in practical network scenarios to enhance communication efficiency.	12	3	4
	(OR)			
	(b) In the context of transitioning to IPv6 and improving mobility support for the telecommunications company, discuss the challenges and advantages associated with IPv6 mobility.			
32.	(a) Describe how ATM cells are structured and how they contribute to efficient data transport. Discuss the benefits of using ATM in a high-capacity network environment and its suitability for multimedia applications.	12	3	5
	(OR)			
	(b) Describe how HDLC addresses data integrity, framing, and flow control in the context of the logistics company's requirements.			

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