CENTRAL POLYTECHNIC COLLEGE

THARAMANI, CHENNAI – 600 113

(AN AUTONOMOUS INSTITUTION)

DEPARTMENT OF COMPUTER ENGINEERING

QUESTION BANK

FOR

ECS41010 - COMPUTER NETWORKS AND SECURITY

UNIT	Q NO	QUESTIONS
1	1	Which component of a data communication system is responsible for converting messages into signals? (a) Receiver (b) Medium (c) Transmitter (d) Protocol **Ans:Transmitter**
1	2	Which data flow allows communication only in one direction? (a) Duplex (b) Half Duplex (c) Full Duplex (d) Simplex **Ans:Simplex**
1	3	In full duplex mode, communication is: (a) One-way at a time (b) Alternating (c) Simultaneous in both directions (d) Only broadcast **Ans:Simultaneous in both directions**
1	4	A multipoint connection is best described as: (a) Dedicated between two devices (b) Shared among multiple devices (c) Only wireless (d) Only wired **Ans:Shared among multiple devices**
1	5	Which device is used to connect different networks with different protocols? (a) Switch (b) Hub (c) Router (d) Gateway **Ans:Gateway**
1	6	Why is full-duplex communication more efficient than half-duplex? (a) It uses fewer resources (b) It prevents collisions (c) It doubles throughput (d) It does not require synchronization **Ans:It doubles throughput**
1	7	Why is a point-to-point connection often more reliable than multipoint? (a) Lower cost (b) Easier error detection (c) Less interference (d) Uses less bandwidth **Ans:Less interference**
1	8	In a bus topology, what happens if the main cable fails? (a) Only one device disconnects (b) Network continues with reduced speed (c) Entire network fails (d) Only half network is affected **Ans:Entire network fails**
1	9	Why is a mesh topology highly fault tolerant? (a) It has no central cable (b) It provides multiple redundant paths (c) It uses wireless only (d) It uses fewer nodes **Ans:It provides multiple redundant paths**
1	10	Which topology is easiest to troubleshoot when a device fails? (a) Mesh (b) Star (c) Ring (d) Bus **Ans:Star**

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1	11	If two users are trying to send data at the same time on a half-duplex system, what happens? (a) Both succeed (b) One waits (c) Both fail (d) Data merges **Ans:One waits**
1	12	Which network type is best suited for connecting devices within a single building? (a) LAN (b) MAN (c) WAN (d) Internet **Ans:LAN**
1	13	A college campus interconnecting departments across the city is an example of: (a) WAN (b) LAN (c) MAN (d) Intranet **Ans:MAN**
1	14	Which scenario best illustrates peer-to-peer networking? (a) File sharing between two laptops directly (b) Client accessing web server (c) ISP providing internet (d) Office intranet portal **Ans:File sharing between two laptops directly**
1	15	An ISP provides your home with internet access. Which role does the ISP act as? (a) Client (b) Server (c) Gateway (d) Router **Ans:Server**
1	16	You want to share files securely within your company only. Which network should you use? (a) Intranet (b) Internet (c) MAN (d) WAN **Ans:Intranet**
1	17	Which network device forwards data packets based on IP addresses? (a) Switch (b) Hub (c) Router (d) Repeater **Ans:Router**
1	18	Which device works at the data link layer to forward frames? (a) Switch (b) Router (c) Gateway (d) Firewall **Ans:Switch**
1	19	If one link in a ring topology breaks, what is the immediate effect? (a) No effect (b) All communication stops (c) Only one device is isolated (d) Speed reduces slightly **Ans:All communication stops**
1	20	A bank requires highly secure, private communication between branches in different cities. Which setup is most suitable? (a) LAN (b) Internet (c) MAN (d) WAN with VPN **Ans:WAN with VPN**

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1	21	Which is the main difference between LAN and WAN? (a) Speed (b) Topology (c) Distance covered (d) Devices used **Ans:Distance covered**
1	22	Why is Wi-Fi often considered less secure than wired LAN? (a) Limited bandwidth (b) Easy to intercept signals (c) More expensive (d) No error detection **Ans:Easy to intercept signals**
1	23	In data communication, what role do protocols play? (a) Store data (b) Define rules for communication (c) Control devices (d) Provide memory **Ans:Define rules for communication**
1	24	Which device should be used to connect two LANs with different architectures? (a) Hub (b) Bridge (c) Gateway (d) Switch **Ans:Gateway**
1	25	In which situation would a repeater be most useful? (a) Extending Wi-Fi range (b) Converting analog to digital (c) Filtering packets (d) Managing IP addresses **Ans:Extending Wi-Fi range**
1	26	Which topology is most vulnerable to a central hub failure? (a) Mesh (b) Star (c) Ring (d) Bus **Ans:Star**
1	27	Which connection type would be best for video conferencing between two offices? (a) Multipoint (b) Point-to-Point (c) Bus (d) Hybrid **Ans:Point-to-Point**
1	28	Why is a hybrid topology often implemented in large enterprises? (a) To reduce redundancy (b) To combine strengths of multiple topologies (c) To reduce hardware requirements (d) To eliminate need for routers **Ans:To combine strengths of multiple topologies**
1	29	Which factor limits Wi-Fi coverage compared to LAN? (a) Bandwidth (b) Physical obstacles (c) Protocols (d) Devices used **Ans:Physical obstacles**
1	30	Why is WAN slower compared to LAN? (a) Less bandwidth and more distance (b) Poor topology (c) Limited protocols (d) Fewer devices **Ans:Less bandwidth and more distance**

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1	31	Why is client-server architecture more secure than peer-to-peer? (a) Centralized control of data (b) More devices (c) Lower cost (d) No communication delay **Ans:Centralized control of data**
1	32	Why do ISPs often provide gateways instead of just routers? (a) To enable protocol conversion (b) To reduce bandwidth (c) To increase speed (d) To control collisions **Ans:To enable protocol conversion**
1	33	Which device ensures data is sent to the correct destination using MAC address? (a) Hub (b) Switch (c) Router (d) Gateway **Ans:Switch**
1	34	If a router fails in a WAN, what is the likely impact? (a) Total collapse of internet (b) Only affected routes fail (c) All LANs fail (d) No impact **Ans:Only affected routes fail**
1	35	Which scenario best describes intranet use? (a) Online shopping (b) Employee portal for internal documents (c) Wi-Fi in a café (d) File transfer between friends **Ans:Employee portal for internal documents**
1	36	Which device is needed to interconnect different LANs over the internet? (a) Switch (b) Router (c) Repeater (d) Bridge **Ans:Router**
1	37	Which factor makes Bluetooth less suitable for high-speed file transfer than Wi-Fi? (a) Higher cost (b) Shorter range and lower bandwidth (c) Complex setup (d) Poor security **Ans:Shorter range and lower bandwidth**
1	38	Why is bus topology less scalable than star? (a) It uses switches (b) Cable length and collisions increase (c) It uses multiple protocols (d) Central hub dependency **Ans:Cable length and collisions increase**
1	39	Which topology provides fault tolerance but is complex to configure? (a) Bus (b) Mesh (c) Ring (d) Hybrid **Ans:Mesh**
1	40	If a switch is replaced with a hub, what change occurs? (a) Faster routing (b) More collisions (c) Less security risk (d) Better efficiency **Ans:More collisions**

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1	41	Which device acts as a translator between two different network architectures? (a) Hub (b) Switch (c) Router (d) Gateway **Ans:Gateway**
1	42	Why is intranet often faster than internet? (a) Fewer users and local traffic (b) More devices (c) Better topology (d) Centralized ISP **Ans:Fewer users and local traffic**
1	43	Why are protocols necessary in communication? (a) Prevents unauthorized access (b) Enables error checking (c) Provides rules for interoperability (d) Reduces cost **Ans:Provides rules for interoperability**
1	44	Which is the most reliable way to connect two networks securely across the internet? (a) VPN (b) Bridge (c) Hub (d) Wi-Fi **Ans:VPN**
1	45	Which topology should be used for a company requiring centralized monitoring? (a) Mesh (b) Star (c) Ring (d) Bus **Ans:Star**
1	46	If two departments use different protocols but need to communicate, which device enables it? (a) Switch (b) Router (c) Gateway (d) Repeater **Ans:Gateway**
1	47	Which network type is most cost-effective for a small household? (a) LAN (b) WAN (c) MAN (d) Intranet **Ans:LAN**
1	48	Why is star topology preferred for offices with growing staff? (a) It is cheapest (b) It allows easy device addition (c) It avoids cables (d) It doesn’t use a switch **Ans:It allows easy device addition**
1	49	Which device is most effective in reducing broadcast domains? (a) Switch (b) Router (c) Repeater (d) Bridge **Ans:Router**
1	50	Which factor distinguishes MAN from LAN and WAN? (a) Ownership (b) Devices (c) Distance covered (d) Protocol **Ans:Distance covered**

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2	1	How many layers are defined in the OSI reference model? (a) 5 (b) 6 (c) 7 (d) 8 **Ans:7**
2	2	Which OSI layer is responsible for error detection and correction? (a) Physical (b) Data Link (c) Network (d) Transport **Ans:Data Link**
2	3	Which OSI layer ensures reliable end-to-end communication? (a) Network (b) Transport (c) Session (d) Application **Ans:Transport**
2	4	In OSI, which layer handles logical addressing? (a) Data Link (b) Network (c) Session (d) Physical **Ans:Network**
2	5	Which OSI layer deals with encryption and compression? (a) Presentation (b) Application (c) Session (d) Transport **Ans:Presentation**
2	6	Which protocol suite is primarily used on the Internet? (a) OSI (b) TCP/IP (c) Token Ring (d) Bluetooth **Ans:TCP/IP**
2	7	Why was a layered architecture introduced in network models? (a) To increase speed (b) To divide functions into manageable layers (c) To avoid redundancy (d) To reduce cost **Ans:To divide functions into manageable layers**
2	8	Which TCP/IP layer combines OSI's session, presentation, and application layers? (a) Transport (b) Network (c) Application (d) Data Link **Ans:Application**
2	9	What is the main function of the physical layer in OSI? (a) Routing packets (b) Providing logical addressing (c) Defining bit transmission over medium (d) Error detection **Ans:Defining bit transmission over medium**
2	10	Which OSI layer is closest to the user? (a) Transport (b) Application (c) Session (d) Presentation **Ans:Application**

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2	11	Which layer of OSI corresponds to the IP protocol in TCP/IP? (a) Transport (b) Network (c) Data Link (d) Session **Ans:Network**
2	12	Which layer of OSI is responsible for flow control? (a) Data Link (b) Session (c) Transport (d) Network **Ans:Transport**
2	13	Which protocol works at the transport layer of TCP/IP? (a) IP (b) TCP (c) ARP (d) ICMP **Ans:TCP**
2	14	Which TCP/IP layer is responsible for routing data across networks? (a) Application (b) Network Access (c) Internet (d) Transport **Ans:Internet**
2	15	Which OSI layer establishes, manages, and terminates sessions? (a) Application (b) Session (c) Presentation (d) Transport **Ans:Session**
2	16	Which protocol is connectionless in TCP/IP? (a) TCP (b) UDP (c) SMTP (d) FTP **Ans:UDP**
2	17	Which access control mechanism is used in Ethernet (802.3)? (a) Token passing (b) CSMA/CD (c) CSMA/CA (d) Polling **Ans:CSMA/CD**
2	18	What is the access method used in Token Ring (802.5)? (a) CSMA/CD (b) CSMA/CA (c) Token Passing (d) Slotted ALOHA **Ans:Token Passing**
2	19	Which of the following Ethernet types provides 100 Mbps speed? (a) Fast Ethernet (b) Gigabit Ethernet (c) 10GE (d) 800GE **Ans:Fast Ethernet**
2	20	Which type of Ethernet supports 1 Gbps speed? (a) 10Base-T (b) Fast Ethernet (c) Gigabit Ethernet (d) Token Ring **Ans:Gigabit Ethernet**

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2	21	Which Ethernet standard can scale up to 800 Gbps? (a) Fast Ethernet (b) Gigabit Ethernet (c) 10GE (d) High-Speed Ethernet (10GE to 800GE) **Ans:High-Speed Ethernet (10GE to 800GE)**
2	22	Why is CSMA/CD less used in modern Ethernet? (a) High bandwidth (b) Collisions are eliminated by switches (c) Too expensive (d) Requires token **Ans:Collisions are eliminated by switches**
2	23	Why does Ethernet dominate over Token Ring in popularity? (a) Cheaper and simpler (b) More secure (c) Faster by default (d) Token management is easier **Ans:Cheaper and simpler**
2	24	Which field in Ethernet frame ensures error detection? (a) MAC address (b) Preamble (c) FCS (d) Length **Ans:FCS**
2	25	In CSMA/CD, what happens if a collision is detected? (a) Data continues (b) Both stop, wait, retransmit (c) Both succeed (d) Error ignored **Ans:Both stop, wait, retransmit**
2	26	Which is a main drawback of Token Ring? (a) Expensive hardware (b) Collisions (c) No reliability (d) No standard **Ans:Expensive hardware**
2	27	Which Ethernet type is most suitable for backbone networks today? (a) Fast Ethernet (b) Token Ring (c) Gigabit Ethernet (d) 10GE/800GE **Ans:10GE/800GE**
2	28	Why is the OSI model important despite TCP/IP dominance? (a) It replaces TCP/IP (b) It defines theoretical layers for understanding (c) It is faster (d) It only works for LANs **Ans:It defines theoretical layers for understanding**
2	29	If two hosts are connected on different networks, which OSI layer ensures delivery? (a) Data Link (b) Network (c) Physical (d) Presentation **Ans:Network**
2	30	In TCP/IP, which layer corresponds to the OSI data link and physical layers? (a) Application (b) Network Access (c) Transport (d) Internet **Ans:Network Access**

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2	31	Which OSI layer adds headers for logical addressing? (a) Network (b) Data Link (c) Session (d) Transport **Ans:Network**
2	32	Which Ethernet type is backward compatible with Fast Ethernet? (a) 10GE (b) Gigabit Ethernet (c) Token Ring (d) 800GE **Ans:Gigabit Ethernet**
2	33	What is a major limitation of CSMA/CD in high-speed Ethernet? (a) Works only with fiber (b) Latency and collision handling (c) Security issues (d) Too costly **Ans:Latency and collision handling**
2	34	In 802.3 Ethernet, what is the role of the preamble? (a) Addressing (b) Synchronization (c) Error detection (d) Security **Ans:Synchronization**
2	35	Which TCP/IP protocol provides host-to-host reliability? (a) IP (b) UDP (c) TCP (d) ICMP **Ans:TCP**
2	36	Which protocol in TCP/IP is responsible for addressing and routing? (a) TCP (b) UDP (c) IP (d) ICMP **Ans:IP**
2	37	What differentiates 802.3 from 802.5? (a) Use of token (b) CSMA/CD vs Token Passing (c) Data rates (d) Error detection **Ans:CSMA/CD vs Token Passing**
2	38	Which Ethernet frame field contains source and destination addresses? (a) Length (b) MAC address (c) Preamble (d) FCS **Ans:MAC address**
2	39	Which OSI layer corresponds to SMTP and HTTP protocols? (a) Transport (b) Application (c) Session (d) Presentation **Ans:Application**
2	40	Which Ethernet type first introduced 10 Gbps? (a) Gigabit Ethernet (b) Fast Ethernet (c) 10GE (d) 800GE **Ans:10GE**

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2	41	Which layer handles synchronization of data exchange? (a) Session (b) Application (c) Presentation (d) Transport **Ans:Session**
2	42	Why is 800GE being adopted in modern data centers? (a) Cheaper than Fast Ethernet (b) Supports massive bandwidth demand (c) Simpler design (d) Uses copper only **Ans:Supports massive bandwidth demand**
2	43	Which OSI layer is responsible for multiplexing and demultiplexing of connections? (a) Transport (b) Network (c) Data Link (d) Session **Ans:Transport**
2	44	Which protocol in TCP/IP does not guarantee delivery but provides faster speed? (a) TCP (b) IP (c) UDP (d) FTP **Ans:UDP**
2	45	What is the primary function of the TCP/IP Internet layer? (a) Reliable delivery (b) Logical addressing and routing (c) Physical transmission (d) Encryption **Ans:Logical addressing and routing**
2	46	Which Ethernet type is suitable for low-cost home networking today? (a) Fast Ethernet (b) Token Ring (c) Gigabit Ethernet (d) 10GE **Ans:Gigabit Ethernet**
2	47	Which TCP/IP protocol handles error reporting? (a) TCP (b) UDP (c) IP (d) ICMP **Ans:ICMP**
2	48	Which OSI layer uses ports to identify applications? (a) Transport (b) Network (c) Session (d) Data Link **Ans:Transport**
2	49	Which TCP/IP layer corresponds to Ethernet in OSI? (a) Transport (b) Application (c) Internet (d) Network Access **Ans:Network Access**
2	50	Which OSI layer is concerned with data representation and encoding? (a) Session (b) Presentation (c) Network (d) Transport **Ans:Presentation**

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3	1	Which protocol is responsible for logical addressing at the network layer? (a) ARP (b) IP (c) RARP (d) ICMP **Ans:IP**
3	2	What does ARP do? (a) Converts MAC to IP (b) Converts IP to MAC (c) Converts IPv4 to IPv6 (d) Converts hostname to IP **Ans:Converts IP to MAC**
3	3	What is the role of RARP? (a) IP to MAC (b) MAC to IP (c) IPv4 to IPv6 (d) IP to hostname **Ans:MAC to IP**
3	4	Which version of IP supports 128-bit addressing? (a) IPv4 (b) IPv6 (c) ARP (d) RARP **Ans:IPv6**
3	5	How many bits are there in an IPv4 address? (a) 16 (b) 32 (c) 64 (d) 128 **Ans:32**
3	6	Which notation is used to represent IPv4 addresses? (a) Binary (b) Hexadecimal (c) Dotted Decimal (d) Octal **Ans:Dotted Decimal**
3	7	Why was IPv6 introduced? (a) To increase routing speed (b) To expand address space (c) To replace Ethernet (d) To improve FTP **Ans:To expand address space**
3	8	What is the primary advantage of subnetting? (a) Increases IP space (b) Reduces broadcast traffic (c) Makes IP addressing longer (d) Increases collisions **Ans:Reduces broadcast traffic**
3	9	What does supernetting primarily achieve? (a) Larger broadcast domains (b) Aggregates multiple networks (c) Reduces routing protocols (d) Converts IPv4 to IPv6 **Ans:Aggregates multiple networks**
3	10	Which of these addresses is valid IPv4? (a) 192.168.0.256 (b) 300.1.1.1 (c) 172.16.5.10 (d) 2001:db8::1 **Ans:172.16.5.10**

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3	11	Which IPv6 address type is equivalent to IPv4 broadcast? (a) Unicast (b) Multicast (c) Anycast (d) None **Ans:None**
3	12	Which of these is a private IPv4 address? (a) 8.8.8.8 (b) 192.168.1.1 (c) 172.33.4.5 (d) 11.0.0.1 **Ans:192.168.1.1**
3	13	Which protocol is used to send error messages in IP networks? (a) TCP (b) UDP (c) ICMP (d) ARP **Ans:ICMP**
3	14	In subnetting, what does CIDR notation "/24" mean? (a) 24 subnets (b) 24-bit mask (c) 24 hosts (d) 24-bit address **Ans:24-bit mask**
3	15	Which transport protocol provides connection-oriented service? (a) UDP (b) TCP (c) IP (d) ICMP **Ans:TCP**
3	16	Which protocol provides connectionless service? (a) UDP (b) TCP (c) IP (d) HTTP **Ans:UDP**
3	17	Which protocol uses ports to identify processes? (a) IP (b) TCP (c) UDP (d) Both TCP & UDP **Ans:Both TCP & UDP**
3	18	Which mechanism is used in Stop-and-Wait protocol? (a) Windowing (b) Sliding window (c) Send-acknowledge (d) Error ignoring **Ans:Send-acknowledge**
3	19	Why does TCP provide higher reliability than UDP? (a) Error reporting (b) Flow and congestion control (c) Retransmission (d) All of the above **Ans:All of the above**
3	20	Which scenario best suits connectionless communication? (a) Online banking (b) File download (c) Voice call (d) Remote login **Ans:Voice call**

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3	21	Which scenario best suits connection-oriented communication? (a) Video call (b) DNS query (c) File transfer (d) Gaming **Ans:File transfer**
3	22	What is a socket defined as? (a) IP address + MAC (b) IP address + Port (c) MAC address + Port (d) IP only **Ans:IP address + Port**
3	23	Which transport protocol uses sequence numbers? (a) IP (b) TCP (c) UDP (d) ARP **Ans:TCP**
3	24	Which transport protocol is best for DNS queries? (a) TCP (b) UDP (c) HTTP (d) FTP **Ans:UDP**
3	25	Which field in TCP header ensures reliable sequencing? (a) Port number (b) Window size (c) Sequence number (d) Checksum **Ans:Sequence number**
3	26	Which application protocol transfers files? (a) HTTP (b) FTP (c) Telnet (d) SMTP **Ans:FTP**
3	27	Which application protocol provides web page access? (a) FTP (b) Telnet (c) HTTP (d) DNS **Ans:HTTP**
3	28	Which application protocol provides remote login? (a) FTP (b) HTTP (c) Telnet (d) UDP **Ans:Telnet**
3	29	Which application layer protocol uses port 80? (a) FTP (b) HTTP (c) Telnet (d) DNS **Ans:HTTP**
3	30	Which application layer protocol is insecure due to cleartext transmission? (a) HTTP (b) Telnet (c) FTP (d) All of the above **Ans:All of the above**

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3	31	Which application layer protocol is most vulnerable to password sniffing? (a) HTTP (b) FTP (c) Telnet (d) SMTP **Ans:Telnet**
3	32	Which protocol is preferred over Telnet for secure remote login? (a) FTP (b) SSH (c) HTTP (d) TCP **Ans:SSH**
3	33	Which application layer protocol is stateless? (a) FTP (b) HTTP (c) Telnet (d) SMTP **Ans:HTTP**
3	34	Which application layer protocol is interactive and command-oriented? (a) FTP (b) Telnet (c) SMTP (d) DNS **Ans:Telnet**
3	35	Which addressing format allows more hosts per network? (a) Subnetting (b) Supernetting (c) IPv6 (d) RARP **Ans:Supernetting**
3	36	Which IP protocol version supports autoconfiguration? (a) IPv4 (b) IPv6 (c) ARP (d) RARP **Ans:IPv6**
3	37	Which type of IPv6 address is used for one-to-many communication? (a) Unicast (b) Multicast (c) Anycast (d) Broadcast **Ans:Multicast**
3	38	Which addressing type allows delivery to the nearest server? (a) Broadcast (b) Multicast (c) Anycast (d) Unicast **Ans:Anycast**
3	39	Which protocol would be best for real-time gaming? (a) TCP (b) UDP (c) FTP (d) HTTP **Ans:UDP**
3	40	What is the maximum number of addresses in IPv4? (a) ~4 billion (b) ~6 billion (c) ~8 billion (d) ~10 billion **Ans:~4 billion**

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3	41	Which protocol supports sliding window flow control? (a) TCP (b) UDP (c) IP (d) ARP **Ans:TCP**
3	42	Which header field identifies applications in TCP/UDP? (a) Sequence number (b) Port number (c) Address (d) Protocol ID **Ans:Port number**
3	43	Which IPv6 feature makes NAT unnecessary? (a) Multicast (b) Anycast (c) Large address space (d) CIDR **Ans:Large address space**
3	44	Which protocol translates domain names into IP addresses? (a) HTTP (b) FTP (c) DNS (d) Telnet **Ans:DNS**
3	45	Which application protocol typically uses port 23? (a) FTP (b) HTTP (c) Telnet (d) SMTP **Ans:Telnet**
3	46	Which feature of TCP makes it slower than UDP? (a) Sliding window (b) Handshake and reliability (c) Larger header (d) All of the above **Ans:All of the above**
3	47	Which protocol ensures that an IP address corresponds to a physical MAC? (a) RARP (b) ARP (c) ICMP (d) DNS **Ans:ARP**
3	48	Which is a key limitation of Stop-and-Wait protocol? (a) Error correction (b) Utilization of bandwidth (c) Window size (d) Synchronization **Ans:Utilization of bandwidth**
3	49	Which IPv6 feature simplifies routing by aggregating prefixes? (a) Anycast (b) CIDR (c) SLAAC (d) Multicast **Ans:CIDR**
3	50	Which protocol is typically layered above TCP for file transfer? (a) HTTP (b) FTP (c) UDP (d) ICMP **Ans:FTP**

UNIT	Q NO	QUESTIONS
4	1	What is the primary goal of network security? (a) Faster communication (b) Protect data integrity, confidentiality, availability (c) Increase bandwidth (d) Reduce cost **Ans:Protect data integrity, confidentiality, availability**
4	2	Why is network security needed? (a) To prevent unauthorized access (b) To reduce internet speed (c) To support IPv6 (d) To increase latency **Ans:To prevent unauthorized access**
4	3	Which principle ensures that information is not altered? (a) Confidentiality (b) Integrity (c) Availability (d) Authentication **Ans:Integrity**
4	4	Which principle ensures only authorized access to information? (a) Confidentiality (b) Integrity (c) Availability (d) Accountability **Ans:Confidentiality**
4	5	An attack where unauthorized entities listen to communication is: (a) Active attack (b) Passive attack (c) Legal attack (d) Criminal attack **Ans:Passive attack**
4	6	Modifying transmitted data is an example of: (a) Passive attack (b) Active attack (c) Legal attack (d) Supply chain attack **Ans:Active attack**
4	7	Which of these is a criminal attack? (a) Unauthorized hacking (b) Security audit (c) System update (d) Encryption **Ans:Unauthorized hacking**
4	8	Which is an example of a legal attack? (a) Court-ordered surveillance (b) Phishing (c) Virus injection (d) DDoS **Ans:Court-ordered surveillance**
4	9	Which is an example of a supply chain attack? (a) Tampered software update (b) ARP spoofing (c) Password guessing (d) Sniffing **Ans:Tampered software update**
4	10	Which attack type is harder to detect? (a) Passive attack (b) Active attack (c) Supply chain attack (d) Criminal attack **Ans:Passive attack**

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4	11	Flooding a server with traffic is an example of: (a) Passive attack (b) DoS (c) Supply chain attack (d) Legal attack **Ans:DoS**
4	12	Which principle of security is violated in a DDoS attack? (a) Confidentiality (b) Integrity (c) Availability (d) Authentication **Ans:Availability**
4	13	Which of these attacks targets human psychology? (a) Phishing (b) SQL injection (c) ARP spoofing (d) DES cracking **Ans:Phishing**
4	14	Which of these is an insider attack? (a) Spyware (b) Employee data theft (c) Virus (d) DDoS **Ans:Employee data theft**
4	15	Which is NOT a goal of network security? (a) Protect confidentiality (b) Prevent unauthorized access (c) Improve video quality (d) Ensure data integrity **Ans:Improve video quality**
4	16	Cryptography is primarily used to: (a) Compress data (b) Encrypt and secure data (c) Improve routing (d) Increase speed **Ans:Encrypt and secure data**
4	17	Symmetric encryption uses: (a) One key for both encryption and decryption (b) Two different keys (c) No keys (d) Biometric keys **Ans:One key for both encryption and decryption**
4	18	Public key cryptography uses: (a) One secret key (b) Two keys: public and private (c) No keys (d) Random passwords **Ans:Two keys: public and private**
4	19	Which of these is a symmetric block cipher? (a) RSA (b) DES (c) Diffie-Hellman (d) ECC **Ans:DES**
4	20	Which is stronger in terms of key length? (a) DES (b) 3DES (c) RSA (d) RARP **Ans:3DES**

UNIT	Q NO	QUESTIONS
4	21	Digest functions are also known as: (a) Hash functions (b) Block ciphers (c) Stream ciphers (d) Public key encryption **Ans:Hash functions**
4	22	Which algorithm is used in digital signatures? (a) RSA (b) DES (c) AES (d) MD5 **Ans:RSA**
4	23	Which cryptographic method ensures authentication? (a) Symmetric key (b) Public key (c) Digital signature (d) Digest **Ans:Digital signature**
4	24	Which principle ensures that a sender cannot deny sending a message? (a) Confidentiality (b) Integrity (c) Non-repudiation (d) Availability **Ans:Non-repudiation**
4	25	Why is symmetric encryption faster? (a) Uses smaller key sizes (b) Uses only one key (c) No authentication (d) No confidentiality **Ans:Uses only one key**
4	26	What is a limitation of symmetric encryption? (a) Too secure (b) Key distribution problem (c) Large ciphertext (d) Slow **Ans:Key distribution problem**
4	27	Why is public key cryptography slower than symmetric? (a) Larger keys, more computation (b) No confidentiality (c) No hashing (d) No distribution **Ans:Larger keys, more computation**
4	28	Which is an advantage of public key cryptography? (a) Easier key management (b) Higher speed (c) No encryption needed (d) Small key size **Ans:Easier key management**
4	29	Which encryption standard replaced DES? (a) RSA (b) AES (c) Diffie-Hellman (d) Blowfish **Ans:AES**
4	30	Which property does a digest function provide? (a) Reversibility (b) One-way transformation (c) Encryption (d) Key exchange **Ans:One-way transformation**

UNIT	Q NO	QUESTIONS
4	31	Which attack tries all possible keys? (a) Replay attack (b) Brute force (c) Man-in-the-middle (d) Phishing **Ans:Brute force**
4	32	Which cryptographic method is best for bulk data encryption? (a) RSA (b) AES (c) Digital signature (d) SHA-256 **Ans:AES**
4	33	Which attack modifies data during transmission? (a) Passive (b) Active (c) Digest (d) Key exchange **Ans:Active**
4	34	Which ensures message integrity? (a) Symmetric encryption (b) Public key encryption (c) Hash function (d) Phishing **Ans:Hash function**
4	35	Which process does RSA rely on? (a) Factoring large primes (b) Multiplying small numbers (c) Hashing (d) Key exchange **Ans:Factoring large primes**
4	36	Which protocol commonly uses RSA for secure key exchange? (a) FTP (b) SSL/TLS (c) HTTP (d) Telnet **Ans:SSL/TLS**
4	37	Which ensures that a hash value cannot be reversed? (a) Compression (b) One-wayness (c) Encryption (d) Availability **Ans:One-wayness**
4	38	Which is an example of software supply chain attack? (a) Trojan in vendor update (b) Virus in a PC (c) Sniffing (d) Brute force **Ans:Trojan in vendor update**
4	39	Which algorithm is NOT symmetric? (a) DES (b) AES (c) Blowfish (d) RSA **Ans:RSA**
4	40	Which of these provides message authentication without encryption? (a) Digital signature (b) RSA (c) DES (d) AES **Ans:Digital signature**

UNIT	Q NO	QUESTIONS
4	41	Which provides the smallest key size for strong security? (a) AES (b) RSA (c) ECC (d) DES **Ans:ECC**
4	42	Why is AES preferred over DES? (a) Larger key size, better security (b) Simpler algorithm (c) No key required (d) Public key based **Ans:Larger key size, better security**
4	43	Which attack involves tricking a user into installing fake software updates? (a) DoS (b) Social engineering (c) Supply chain attack (d) ARP poisoning **Ans:Supply chain attack**
4	44	Which principle is violated in eavesdropping? (a) Confidentiality (b) Integrity (c) Availability (d) Non-repudiation **Ans:Confidentiality**
4	45	Which principle is violated if data is modified during transit? (a) Confidentiality (b) Integrity (c) Availability (d) Authentication **Ans:Integrity**
4	46	Which principle is violated in a ransomware attack? (a) Confidentiality (b) Integrity (c) Availability (d) All of the above **Ans:Availability**
4	47	Which ensures that a sender cannot later deny sending? (a) Authentication (b) Confidentiality (c) Digital signature (d) Encryption **Ans:Digital signature**
4	48	Which attack targets hash collisions? (a) Phishing (b) Birthday attack (c) DoS (d) Replay **Ans:Birthday attack**
4	49	Which ensures both confidentiality and integrity? (a) Hashing (b) Symmetric encryption (c) Digital signature (d) Hybrid cryptosystem **Ans:Hybrid cryptosystem**
4	50	Which is a limitation of digital signatures? (a) Cannot encrypt data (b) No authentication (c) Weak algorithms (d) Illegal use **Ans:Cannot encrypt data**

UNIT	Q NO	QUESTIONS
5	1	What is a common example of a bad password? (a) P@ssw0rd123 (b) 123456 (c) !Qaz#Wsx (d) Xy7@9&Lp **Ans:123456**
5	2	A self-replicating program that spreads without human help is a: (a) Virus (b) Worm (c) Trojan (d) Spam **Ans:Worm**
5	3	A malicious program disguised as useful software is: (a) Virus (b) Worm (c) Trojan Horse (d) Spam **Ans:Trojan Horse**
5	4	Which type of malware attaches to files? (a) Worm (b) Virus (c) Trojan (d) Spam **Ans:Virus**
5	5	Spam emails are primarily sent for: (a) Fun (b) Marketing or malicious purposes (c) Authentication (d) Encryption **Ans:Marketing or malicious purposes**
5	6	Which password policy is best to resist brute-force attacks? (a) Short, simple passwords (b) Long, complex passwords (c) Using same password everywhere (d) No password **Ans:Long, complex passwords**
5	7	Which malware spreads via email attachments? (a) Worm (b) Trojan (c) Virus (d) Spam **Ans:Virus**
5	8	Which attack is MOST difficult to detect? (a) Worm (b) Trojan Horse (c) Virus (d) Spam **Ans:Trojan Horse**
5	9	Which firewall works at the network layer? (a) Packet filter (b) Application gateway (c) Honeypot (d) Proxy firewall **Ans:Packet filter**
5	10	Which firewall works at the application layer? (a) Packet filter (b) Application gateway (c) Stateful firewall (d) Honeypot **Ans:Application gateway**

UNIT	Q NO	QUESTIONS
5	11	Which firewall type tracks TCP sessions? (a) Stateless filter (b) Stateful inspection firewall (c) Application proxy (d) Honeypot **Ans:Stateful inspection firewall**
5	12	A key limitation of firewalls is: (a) Cannot filter by IP (b) Cannot stop insider attacks (c) Cannot block ports (d) Cannot log traffic **Ans:Cannot stop insider attacks**
5	13	Which security mechanism acts as a decoy to trap attackers? (a) Firewall (b) Honeypot (c) IDS (d) Packet filter **Ans:Honeypot**
5	14	Which is a major limitation of packet filters? (a) Cannot block IPs (b) Cannot filter at application level (c) Cannot detect traffic (d) Cannot log **Ans:Cannot filter at application level**
5	15	Which firewall type provides user authentication? (a) Packet filter (b) Application gateway (c) Stateful filter (d) IDS **Ans:Application gateway**
5	16	Which firewall type is most efficient but less granular? (a) Application gateway (b) Packet filter (c) Honeypot (d) IDS **Ans:Packet filter**
5	17	Which firewall uses both IP and session tracking? (a) Stateless firewall (b) Stateful firewall (c) Application gateway (d) Honeypot **Ans:Stateful firewall**
5	18	Who are considered intruders? (a) Unauthorized users accessing systems (b) Security admins (c) ISP providers (d) Legitimate employees only **Ans:Unauthorized users accessing systems**
5	19	Which is an example of an internal intruder? (a) Hacker on the internet (b) Employee abusing access (c) Script kiddie (d) Botnet **Ans:Employee abusing access**
5	20	An external intruder is: (a) Trusted employee (b) Outsider with unauthorized access (c) Antivirus software (d) Honeypot **Ans:Outsider with unauthorized access**

UNIT	Q NO	QUESTIONS
5	21	Which Intruder Detection System monitors network traffic? (a) NIDS (b) HIDS (c) Firewall (d) Honeypot **Ans:NIDS**
5	22	Which Intruder Detection System monitors system logs and files? (a) NIDS (b) HIDS (c) Firewall (d) Router **Ans:HIDS**
5	23	Intruder Detection System is primarily used to: (a) Prevent attacks (b) Detect suspicious activity (c) Encrypt data (d) Block users **Ans:Detect suspicious activity**
5	24	Which classification detects unknown attacks? (a) Misuse detection (b) Anomaly detection (c) Stateful inspection (d) Signature detection **Ans:Anomaly detection**
5	25	Which intrusion detection system has high false positives? (a) Signature-based (b) Anomaly-based (c) Packet filter (d) Application gateway **Ans:Anomaly-based**
5	26	Which system can automatically react to block intrusions? (a) IDS (b) IPS (c) Firewall (d) Honeypot **Ans:IPS**
5	27	Which is a weakness of IDS? (a) Detects attacks (b) Real-time monitoring (c) Cannot prevent attacks (d) Logs intrusions **Ans:Cannot prevent attacks**
5	28	Which is an advantage of honeypots? (a) Protects all systems (b) Diverts and studies attackers (c) Encrypts passwords (d) Blocks viruses **Ans:Diverts and studies attackers**
5	29	Which type of hacker uses scripts without deep knowledge? (a) Black-hat (b) Script kiddie (c) White-hat (d) Grey-hat **Ans:Script kiddie**
5	30	Which hacker type works ethically? (a) Black-hat (b) Grey-hat (c) White-hat (d) Script kiddie **Ans:White-hat**

UNIT	Q NO	QUESTIONS
5	31	Which hacker type sometimes alternates between legal/illegal? (a) Black-hat (b) Grey-hat (c) White-hat (d) Script kiddie **Ans:Grey-hat**
5	32	Which advanced technique exploits memory overflow? (a) SQL Injection (b) Buffer Overflow (c) Worm (d) Spam **Ans:Buffer Overflow**
5	33	Which malware spreads through USB drives? (a) Worm (b) Trojan (c) Virus (d) Spam **Ans:Virus**
5	34	What is the main difference between worms and viruses? (a) Worms require host files (b) Worms replicate independently (c) Viruses spread via spam (d) Worms can't spread on networks **Ans:Worms replicate independently**
5	35	Which malware primarily creates backdoors? (a) Worm (b) Trojan (c) Virus (d) Spam **Ans:Trojan**
5	36	Which type of firewall acts like a middleman proxy? (a) Packet filter (b) Application gateway (c) Stateful firewall (d) Honeypot **Ans:Application gateway**
5	37	Which firewall is easiest to configure? (a) Application gateway (b) Packet filter (c) Stateful firewall (d) Honeypot **Ans:Packet filter**
5	38	Which Intruder Detection System is better for detecting insider misuse? (a) Network Intruder Detection System (b) Host Intruder Detection System (c) IPS (d) Firewall **Ans:Host Intruder Detection System**
5	39	Which Intruder Detection System is better for large network monitoring? (a) Network Intruder Detection System (b) Host Intruder Detection System (c) Firewall (d) Proxy **Ans:Network Intruder Detection System**
5	40	Which setup best lures attackers for research? (a) IDS (b) Firewall (c) Honeypot (d) VPN **Ans:Honeypot**

UNIT	Q NO	QUESTIONS
5	41	Which is the MOST cost-effective firewall for small networks? (a) Application proxy (b) Stateful firewall (c) Packet filter (d) Honeypot **Ans:Packet filter**
5	42	Which hacker technique spreads fastest across the internet? (a) Trojan (b) Worm (c) Virus (d) Spam **Ans:Worm**
5	43	Which hacker technique exploits weak human behavior? (a) SQL Injection (b) Phishing (c) Buffer Overflow (d) Worm **Ans:Phishing**
5	44	Which hacker tool sends massive connection requests to crash a server? (a) Trojan (b) Worm (c) DoS tool (d) Spam bot **Ans:DoS tool**
5	45	Which security mechanism inspects HTTP requests deeply? (a) Stateful firewall (b) Application gateway (c) Packet filter (d) IDS **Ans:Application gateway**
5	46	Which is a common limitation of honeypots? (a) Attract attackers (b) Protect entire networks (c) Gather intelligence (d) Detect intrusions **Ans:Protect entire networks**
5	47	Which hacker group attacks for political or social causes? (a) Cybercriminals (b) Hacktivists (c) Grey-hats (d) Script kiddies **Ans:Hacktivists**
5	48	Which hacker activity often installs spyware? (a) Trojan (b) Worm (c) Virus (d) Spam **Ans:Trojan**
5	49	Which tool type is used to detect and prevent brute-force login attempts? (a) IDS (b) Firewall (c) Honeypot (d) Password manager **Ans:IDS**
5	50	Which best describes the role of intrusion detection systems? (a) Act as firewalls (b) Encrypt traffic (c) Monitor and alert on suspicious activity (d) Replace antivirus **Ans:Monitor and alert on suspicious activity**

UNIT NO	PART B/C	Q. NO	QUESTIONS
1	B	1	Define data communication. What are its essential components?
1	B	2	Differentiate between simplex and half-duplex data flow with an example.
1	B	3	State two differences between half-duplex and full-duplex communication.
1	B	4	What is a point-to-point connection? Give one real-life example.
1	B	5	What is a multipoint connection? How does it differ from point-to-point?
1	B	6	Define network topology. Why is it important in data communication?
1	B	7	List two advantages of using a star topology.
1	B	8	What is a hybrid topology? Give one practical example.
1	B	9	Differentiate between LAN and MAN.
1	B	10	What is the need for computer networks in today's world?
1	B	11	Define intranet. How is it different from the internet?
1	B	12	Who is an Internet Service Provider (ISP)? Give two examples.
1	B	13	Differentiate between client-server and peer-to-peer networks.
1	B	14	What is Bluetooth? Mention one of its uses.
1	B	15	Define a router and its main function.
2	B	1	What is the purpose of a network model in data communication?
2	B	2	Define the OSI model. Why is it called a reference model?
2	B	3	What is meant by layered architecture in networking?
2	B	4	List any two advantages of using a layered architecture.
2	B	5	Which OSI layer is responsible for end-to-end delivery?
2	B	6	State two differences between OSI and TCP/IP models.
2	B	7	What is the main function of the TCP protocol?
2	B	8	Define IP protocol. Why is it called a connectionless protocol?
2	B	9	Expand CSMA/CD. What is its primary function in Ethernet?
2	B	10	What is a token in the Token Ring protocol?
2	B	11	State one difference between Ethernet (802.3) and Token Ring (802.5).
2	B	12	What is Fast Ethernet? State its data rate.
2	B	13	Define Gigabit Ethernet.
2	B	14	What is the significance of 10 Gigabit Ethernet (10GE)?
2	B	15	What is a PDU (Protocol Data Unit) in networking?
3	B	1	What is the function of the Internet Protocol (IP)?
3	B	2	Define ARP. Why is it needed in networking?
3	B	3	Write the difference between ARP and RARP.
3	B	4	What is meant by dotted decimal notation in IP addressing?
3	B	5	Define subnetting in IP networks.
3	B	6	Differentiate between IPv4 and IPv6.
3	B	7	Write two advantages of IPv6 over IPv4.
3	B	8	What is meant by connection-oriented service?
3	B	9	What is meant by connectionless service?
3	B	10	Differentiate between TCP and UDP.
3	B	11	What is a socket in networking?
3	B	12	Define Stop-and-Wait protocol.
3	B	13	What is the function of FTP?
3	B	14	State one use of HTTP.
3	B	15	What is Telnet used for?
4	B	1	Define network security.

UNIT NO	PART B/C	Q. NO	QUESTIONS
4	B	2	State two reasons why network security is needed.
4	B	3	What are the three main principles of network security?
4	B	4	What are criminal attacks? Give one example.
4	B	5	What are legal attacks? Give one example.
4	B	6	Differentiate between passive and active attacks.
4	B	7	What is a software supply chain attack?
4	B	8	Define cryptography.
4	B	9	What is the main principle of symmetric key cryptography?
4	B	10	Define a block cipher.
4	B	11	Mention one feature of the DES algorithm.
4	B	12	What is a digest function?
4	B	13	Define public key cryptography.
4	B	14	What is a digital signature?
4	B	15	Write the difference between symmetric and public key cryptography.
5	B	1	Define hacking.
5	B	2	Mention two historical hacking techniques.
5	B	3	What is open sharing in the context of hacking?
5	B	4	Define a bad password and give an example.
5	B	5	Name two advanced hacking techniques.
5	B	6	What is a virus in computer networks?
5	B	7	Define a worm.
5	B	8	What is a Trojan horse?
5	B	9	Define SPAM.
5	B	10	Name two types of firewalls.
5	B	11	Define a packet filter firewall.
5	B	12	Define an application gateway firewall.
5	B	13	Define an intruder in computer networks.
5	B	14	What is intruder detection?
5	B	15	What is a honeypot in network security?
1	C	1	What is a gateway in networking?
1	C	2	What is Wi-Fi? State one of its applications.
1	C	3	Define WAN and state one example of its application.
1	C	4	Explain with an example how simplex communication can be applied in daily life.
1	C	5	Which topology is best for high fault tolerance? Explain with reason.
1	C	6	Explain mesh topology.
1	C	7	Explain why synchronization between sender and receiver is important in data communication.
1	C	8	Why is full-duplex communication considered more efficient than half-duplex?
1	C	9	Explain how the Internet differs from an Intranet in terms of accessibility.
1	C	10	Describe the role of switches in reducing network congestion.
2	C	1	Describe the functions of the Physical, Data Link, and Network layers of the OSI model.
2	C	2	Explain the role of the Transport, Session, and Presentation layers in the OSI model.
2	C	3	List and explain three main functions of the Application layer.
2	C	4	State three key differences between the OSI model and the TCP/IP model.
2	C	5	Explain the structure of the TCP/IP protocol suite and name its layers.
2	C	6	Describe the role of the IP protocol in TCP/IP networking.
2	C	7	Explain the working principle of CSMA/CD in Ethernet (802.3).

UNIT NO	PART B/C	Q. NO	QUESTIONS
2	C	8	What is a Protocol Data Unit (PDU)? Explain with respect to three OSI layers.
2	C	9	Describe the concept of token passing in Token Ring (802.5).
2	C	10	Compare Ethernet (802.3) and Token Ring (802.5) based on access method, topology, and efficiency.
3	C	1	Describe the purpose of RARP and its importance in diskless systems.
3	C	2	Explain the concept of subnetting with one simple example.
3	C	3	Describe the advantages of using supernetting in IP addressing.
3	C	4	Explain the differences between IPv4 and IPv6 based on address size, security, and header complexity.
3	C	5	Describe the role of the Transport Layer in TCP/IP.
3	C	6	Explain how the Stop-and-Wait protocol handles error control and flow control.
3	C	7	Differentiate between connection-oriented and connectionless services with examples.
3	C	8	Explain the role of sockets in enabling communication between processes.
3	C	9	What is Telnet? Explain its function in remote login.
3	C	10	Explain how the TCP/IP model integrates with application layer protocols like FTP, HTTP, and Telnet.
4	C	1	Explain the need for network security with examples.
4	C	2	Describe the principles of security: confidentiality, integrity, and availability.
4	C	3	Describe how a criminal attack differs from a legal attack.
4	C	4	State and explain the basic principles of symmetric encryption.
4	C	5	Describe the working principle of block encryption.
4	C	6	Explain the key features of the DES algorithm.
4	C	7	What is a digest function? Explain its importance in cryptography.
4	C	8	Explain the basic concept of the RSA algorithm.
4	C	9	Explain the importance of digital signatures in secure communication.
4	C	10	Explain the role of encryption in ensuring confidentiality in networks.
5	C	1	Describe how open sharing can lead to security breaches.
5	C	2	Differentiate between viruses and worms based on propagation.
5	C	3	Explain the working of a Trojan horse with an example.
5	C	4	Describe how SPAM can affect network performance.
5	C	5	Explain the functions of firewalls in protecting networks.
5	C	6	Compare packet filter firewalls and application gateway firewalls.
5	C	7	Explain the classification of intruders with examples.
5	C	8	Describe how intruder detection systems help in network protection.
5	C	9	Describe a scenario where intrusion detection can prevent a security breach.
5	C	10	Explain the importance of combining multiple security mechanisms to protect a network.