23NMB530N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BVoc DEGREE EXAMINATION DECEMBER 2025
(Fifth Semester)

Branch – **NETWORKING AND MOBILE APPLICATION**

MAJOR ELECTIVE COURSE – I TCP/IP PROTOCOL SUITE

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which statement best explains why standards are important in networking? a) They increase hardware costs but improve software performance b) They ensure interoperability between devices and systems c) They limit the growth of new technologies d) They are only necessary for government networks	K1	CO1
	2	In classless addressing (CIDR), the role of the subnet mask is to a) Divide IP addresses into fixed classes b) Specify how many bits are used for the network portion c) Encrypt IP addresses for security d) Identify the MAC address of the host	K2	CO1
2	3	Fragmentation in IPv4 occurs when a) An IP packet is larger than the maximum transmission unit (MTU) of the network b) Multiple users share the same IP address c) The checksum fails d) A TCP connection times out	K1	CO2
	4	UDP is often preferred over TCP in applications such as video streaming and online gaming because a) It guarantees delivery of data b) It reduces delay by avoiding connection setup and retransmissions c) It uses stronger encryption d) It fragments packets more efficiently	K2	CO2
3	5	In TCP, which flag is used to initiate a connection? a) FIN b) RST c) SYN d) ACK	K1	CO3
	6	If the receiver advertises a window size of zero, what does the sender do? a) Terminates the connection immediately b) Stops sending data and waits until window opens c) Continues sending using congestion window d) Resets the connection	K2	CO3
4	7	Which mechanism in TCP prevents a fast sender from overwhelming a slow receiver? a) Congestion control b) Flow control c) Error control d) DNS	K1	CO4
	8	Why is congestion control different from flow control? a) Congestion control protects the receiver, flow control protects the network b) Flow control protects the receiver, congestion control protects the network c) Both are the same thing with different names d) Congestion control only applies to UDP	K2	CO4
5	9	Which protocol is used in IPv6 to handle error reporting and control messages? a) ARP b) ICMPv6 c) IGMP d) TCP	K1	CO5
	10	Group membership messages in ICMPv6 are used for a) Managing multicast group participation b) Error reporting between routers c) Discovering default gateways d) Resolving MAC addresses	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Analyze the differences between the OSI model and the TCP/IP protocol suite. Discuss their similarities, differences, and practical implications for network design.	K3	CO1
		(OR)		
	11.b.	Compare classful and classless addressing. Explain the advantages of classless addressing in modern networks.		
2	12.a.	Examine the IPv4 security mechanisms and discuss how IPSec provides confidentiality, integrity, and authentication.	K4	CO2
		(OR)		
	12.b.	Compare and contrast TCP and UDP with reference to real-world applications (e.g., video streaming vs. file transfer). Discuss why some applications prefer UDP despite the lack of reliability.		
3	13.a.	Analyze the process of TCP connection establishment using the three-way handshake. Why is it necessary compared to a two-way handshake?	K4	CO3
		(OR)		
	13.b.	Compare flow control and congestion control in TCP. How do sliding windows help in achieving reliable communication?		
4	14.a.	Describe the purpose of the congestion window (cwnd) in TCP. How does it interact with the receiver's advertised window?	K3	CO4
		(OR)		
	14.b.	Explain with an example how TCP sliding window mechanism opens and closes windows during flow control.		
5	15.a.	Explain why IPv6 was introduced and how it overcomes the limitations of IPv4. Include at least two major IPv4 limitations addressed by IPv6.	K4	CO5
		(OR)		
	15.b.	Explain the purpose of ICMPv6. Compare its role to ICMP in IPv4, highlighting at least two additional functionalities.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions
ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Assess the impact of IP address depletion on network administration. Suggest strategies (like CIDR, NAT, IPv6 adoption) to manage address scarcity, and justify which would be most effective in a large-scale network.	K5	CO1
2	17	Examine a scenario where UDP is used for DNS queries. Evaluate the advantages and disadvantages of using UDP instead of TCP in this context.	K4	CO2
3	18	Critically evaluate the three-way handshake mechanism of TCP. Discuss its robustness against issues like delayed packets, simultaneous opens, and security threats (e.g., SYN flooding).	K5	CO3
4	19	Discuss the working of TCP congestion control with reference to slow start, congestion avoidance, fast retransmit, and fast recovery. Use a diagram to support your explanation.	K5	CO4
5	20	Critically evaluate the different transition mechanisms from IPv4 to IPv6 (dual stack, tunneling, translation). Which approach balances performance, compatibility, and scalability best?	K5	CO5

Z-Z-Z END