

35B TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2074 Bhadra

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BCT, BEX	Pass Marks	32
Year / Part	IV / II	Time	3 hrs.

Subject: - Networking With IPv6 (*Elective II*) (CT76503)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.

1. Explain about the historical development of IPv6? Explain some Unforeseen Limitations of IPv4 over IPv6. [4+4]
2. Describe how IPv6 interface identifiers are derived, you can choose your own IPv6 prefix to answer this question. [8]
3. Explain how IP datagram fragmentation is carried out in IPv6 with an example. [8]
4. Explain how IPv6 addressing integrates security in its protocol header. Briefly describe the IPSec framework designed for IPv6. [8]
5. Explain the working principle of RIPng and also explain how the routing tables are exchanged in RIPng? [8]
6. What do you mean by Address Family Translation (AFT)? Explain working principle of Dual Stack approach with its pros and cons. [2+8]
7. If you are Telco's/ISP if you have native IPv4 deployed in you network, which translation mechanism will you choose for IPv6 migration? Explain your answer with the translation mechanism you choose with appropriate figure. [2+8]
8. What do you mean by AAAA record and for what purpose this type of record is used? Explain briefly challenges and risk while migration from IPv4 to IPv6 protocol. [2+6]
9. What is Multiprotocol Label Switching (MPLS) and also explain working principle of MPLS with an appropriate figure? [8]
10. The IPv4 address of a node is 120.89.99.1, calculate the following. [2*2]
 - a. 6to4 Address
 - b. NAT64 Address, provided the prefix is 2407:1400:AAAA:AAAA::/96

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Year / Part	IV / II	Time	3 hrs.

Subject: - Networking With IPv6 (*Elective II*) (CT76503)

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1. Why IPv6? Explain with respect to benefits and drawbacks of IPv4 [9]
2. What are the different IPv6 address auto-generation mechanism? Explain. [12]
3. What are the features of ICMPv6? Discuss ICMPv6 message header types. [4+6]
4. What are tunnel and transport mode of authentication? explain [10]
5. What is RTE? Discuss different timers mentioned in RIPv2. [5+5]
6. Why does the world-wide IPv6 migration process is delaying? Discuss the suitable migration approach. [10]
7. How do service provider plan for optimum migration to IPv6? Explain. [10]
8. Write Short Notes on (**Any Three**) [3+3+3]
 - a. DAD
 - b. NGN Architecture for IPv6
 - c. PIM-SM Phases
 - d. Multicast Address
 - e. AFT

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Exam.	Regular		
Level	BE	Full Marks	80
Programme	BEX, BCT	Pass Marks	32
Year / Part	IV / II	Time	3 hrs.

Subject: -Networking with IPv6 (*Elective II*) (CT76503)

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1. **What are the problems with existing IPv4 network? Compare IPv4 and IPv6 with respect to address types and format representations.** [4+4]
2. **Explain how IPv6 machine acquire link local and global addresses with SLAAC.** [12]
3. **What is P-MTU discovery process in IPv6? List the different ICMP message types in IPv6 and explain any two.** [4+6]
4. **What do you mean by security associations? Explain, how authentication is implemented in IPv6.** [2+7]
5. **What is inter-domain and intra-domain routing? How do OSPF routers in an autonomous system come into fully adjacency state? Explain.** [4+8]
6. **Why transition period of IPv6 network migration is long? Explain how DSTM works.** [2+8]
7. **Government has decided to provide IPv6 commercial service beyond 2020. Your ISP is not capable to give IPv6 services yet to the customer. Discuss your IPv6 network deployment plan to meet the government deadline.** [10]
8. **Write Short Notes on (Any Three).** [3+3+3]
 - a. Best features of IPv6 routers
 - b. EUI-64 technique for Interface-ID
 - c. Encryption in IPv6
 - d. Roles of RP in PIM-SM
 - e. MPLS

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Subject: - Networking With IPv6 (*Elective II*) (CT76503)

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1. Explain the IPv6 address types and its representation formats with example. [8]
2. If an IPv4 address 209.30.70.21 is mapped to MAC 02:B1:CA:33:44:D2, then what is? [12]
 - a. Link Local Unicast address
 - b. Solicited node multicast address
 - c. IPv4 Mapped IPv6 address
 - d. IPv4 Compatible IPv6 address
 - e. 6to4 address prefix
 - f. Global unicast address if router advertise the prefix as: 2001:DB8:119::/64
3. What are the features of ICMPv6? Discuss the ICMPv6 message header format for router solicitation and advertisement [4+6]
4. Discuss the security and quality of service features of IPv6. [9]
5. What is the difference between unicast and multicast routing? Define, what is RPF and MRIB in multicast routing? If an IPv6 packet is passing through the RIPng router with MTU 1650 Bytes, how many RTEs that RIPng router can have? [2+4+6]
6. Briefly discuss the strategies that ISPs should follow with respect to network transition to IPv6? What are the benefits and drawbacks of Dual Stack Lite? [6+4]
7. Who are the main stakeholders and what are their responsibilities for IPv6 network migration of public and private networks in Nepal? [10]
8. Write Short Notes on (**Any Three**) [3+3+3]
 - a. ICMPv6 packet too big and parameter problem message types
 - b. NGN and the IPv6
 - c. RPT to SPT switchover in PIM-SM routing.
 - d. SLAAC in IPv6
 - e. IPSEC

35B TRIBHUVAN UNIVERSITY
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2072 Magh

Exam.	New Back (2066 & Later Batch)		
Level	BE	Full Marks	80
Programme	BEX, BCT	Pass Marks	32
Year / Part	IV / II	Time	3 hrs.

Subject: - Networking with IPv6 (*Elective II*) (CT76503)

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- ✓ Attempt **All** questions.
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1. Explain the requirement of IPv6 for next generation networking. [8]
2. Explain EUI-64 interface-ID generation. Also find the link-local unicast, unique-local unicast, solicited node multicast addresses after generating interface ID? [12]
3. What is DAD? How do IPv6 machine perform DAD in SLAAC mechanism? [4+6]
4. Discuss AH and ESP headers with its mode of operation. [9]
5. What is DR and BDR in OSPF routing? Explain OSPF states for IPv6 packet routing [6+6]
6. Briefly discuss IPv4 to IPv6 transition mechanisms? [10]
7. How do you deploy IPv6 for ISPs of Nepal? Propose your concept. [10]
8. Write Short Notes on (**Any Three**) [3+3+3]
 - a. ICMPv6 error message.
 - b. NGN
 - c. Multicast Routing in IPv6.
 - d. IPv6 addressing format.
 - e. Dual-Stack Lite
