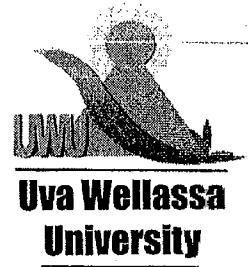




**Uva Wellassa University, Sri Lanka**  
**Faculty of Science and Technology**  
**Computer Science and Technology Degree Program**  
**1<sup>st</sup> Semester Examination February / March 2012**  
**CST 451-2 Advanced Networking & Applications**



Time Duration : Two Hour (02)  
Number of Pages : Two (02)

Index Number :

**Instructions to Candidates**

Read the instructions given for question carefully.  
Answer **All** questions.  
Each question carries **20** marks.

**Question 1: [Wireless LAN]**

- a) A feature of IEEE 802.11 frames is the presence of four address fields. Explain the use of these fields.
- b) Briefly describe the IEEE 802.11 configurations.
- c) State how CSMA/CA algorithm works.
- d) Explain term Network Allocation Vector (NAV).
- e) State two types of services provided by Wireless LAN. List down the services under each type.

**Question 2: [Voice over IP]**

- a) State how data from a conference call between three parties is handled by RTP.
- b) Describe the role of a H.323 gatekeeper in a VOIP to PSTN call setup.
- c) Explain why a forking proxy server can never be stateless.
- d) Show the typical flow of SIP signals and media for the following scenario:
  - User A is registered under a forking proxy server and initiates a call to User B.
  - User B has moved away from the first location tried by User A's proxy server.
  - User A's proxy server finds User B in a second location and a call is initiated.
  - The call is end by User B after minutes of conversation.

**Question 3: [Next Generation Protocols]**

- a) The protocol field used in the IPV4 header is not present in the fixed IPV6 header. State the reason behind this design.
- b) State the merits and demerits of using end to end fragmentation in IPV6.
- c) Describe how an IPV4 address can be translated to an IPV6 address.
- d) DHCP and DHCPv6 (used by IPV6) are both considered as state full protocols. Unlike IPV4, IPV6 also supports a stateless protocol for auto-configuration of IP address.
  - i. Describe the steps followed by a host to obtain an IPV6 address after booting up with an unspecified address.
  - ii. State the advantages of IPV6 auto-configuration compared to DHCP.

**Question 4: [Multicasting]**

- a) Although multicasting is to be an improvement over broadcast, Ethernet switches tend to flood multicast traffic making it less efficient.
  - i. Explain why a switch needs to flood multicast frames.
  - ii. Describe how IGMP snooping can solve the problem.
- b) IGMP allows hosts and routers to communicate group membership information. Explain using examples how a host join a group, responds to poll and leaves a group.
- c) Compare the relative merits and demerits of source distribution tree and shared distribution tree.
- d) State and explain which of the PIM modes (sparse or dense) is more suitable for,
  - i. Multicast group that span WANs and inter-domain networks.
  - ii. Multicast LAN applications.

**Question 5: [Multiprotocol Label Switching]**

- a) State what MPLS is and explain how it works.
- b) Explain following topics in brief:
  - i. Label information base (LIB)
  - ii. Label switch path (LSP)
  - iii. Label stack and its operation
  - iv. Next Hop Label forwarding entry (NHLFE)
- c) List 5 advantages of MPLS compare to typical packet switching.
- d) State a disadvantage of MPLS.