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

Uva Wellassa University

Time Duration	: Two Hour (02)	Index Number :	
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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.