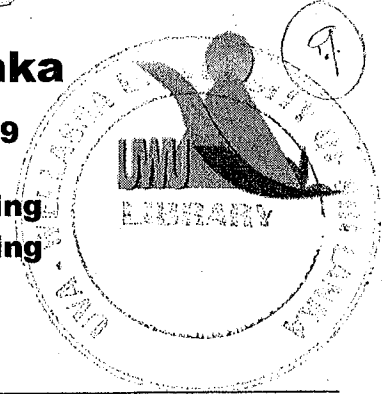


# Uva Wellassa University, Sri Lanka

End Semester Examination – December 2009

**CST301-3 Data Communication and Networking**  
**SCT377-3 Data Communication and Networking**



Part: A

Time: Two (02) Hours

**Answer all questions.**

1)

- a) Select the correct OSI layer(s) from the following table on which each device operates.  
 (Copy the table to your answer sheet and tick the corresponding cells)

**Important: Half (1/2) mark will be deducts for each wrong answer**

(10 Marks)

	Device	Physical Layer	Data link Layer	Network Layer	Transport Layer	Session Layer	Presentation Layer	Application Layer
I.	Repeater operates in							
II.	Hub operates in							
III.	Bridge operate in							
IV.	Switch operate in							
V.	Router operate in							

- b) How does two adjacent layers communicate in a layered network? (05 Marks)
- c) What devices are used as source and detector in case of single mode of fiber? (04 Marks)
- d) Explain the relationship between the Van Allen Belts and the three categories of satellites? (03 Marks)
- e) Why two separate frequencies are used for uplink and downlink transmission in case of satellite communication? (03 Marks)

2)

- a) What is the purpose of dotted decimal representation? (03 Marks)
- b) Give the dotted decimal representation of the following IP address.  
 11011101 10001111 11111101 00001111 (02 Marks)
- c) A full block of IP addresses from 192.96.48.0 to 192.96.48.255 is required to be sub netted into seven subnets with each subnet having 5, 25, 15, 18, 10, 24, 15 hosts respectively.
- i) What is the required subnet mask? (03 marks)
- ii) What is the maximum number of hosts which can be supported by any of the subnets? (02 marks)
- iii) Write down the IP ranges of each subnet. (07 marks)
- d) Write short notes about Adaptive routing and Non-adaptive routing. (05 marks)
- e) Differentiate between Single path and Multi-path routing algorithms. (03 marks)

3)

- a) In mobile phone system standards, what is AMPS and in what way it differs from D-AMPS? (04 Marks)
- b) Mention different categories of computer networks (on the basis of scale) and compare **one** with the others. (06 Marks)
- c) What are the two types of transmission technologies, based on which computer networks can be categorized? (04 Marks)
- d) CSMA/CD is the media access control mechanism used in Ethernet. With respect to CSMA/CD, give a brief description on each of the following terms. (03 Marks)
- i) Carrier Sense (03 Marks)
  - ii) Multiple Access (03 Marks)
  - iii) Collision Detect (02 Marks)
- e) How performance is improved in CSMA/CD protocol compared to CSMA protocol? (02 Marks)

4) You are assigned as the network administrator of an organization. The organization already have purchase 02 computer servers (without operating systems), 30 personal computers (with operating systems) and some UTP cables. Your first job is to set up and configure a LAN for the organization.

- a) What are the additional hardware items required to complete this job? (05 Marks)
- b) Your management needs a centralized authentication system for all the users. How can you fulfill this requirement? Explain. (05 Marks)
- c) The organization obtained ADSL internet connection form an ISP. What additional hardware is necessary to connect this LAN to the internet? (03 Marks)
- d) If the users of the LAN complain that although they can "ping" an IP address of a computer located outside of their network, they are unable to access web sites, what may be the most possible cause for this behavior? (02 Marks)
- e) After solving the above problem, users complained about the unsatisfactory speed of the internet access. Without requesting a higher connection speed from the ISP, what can you do inside your organization to have better internet speed using available resources? (05 Marks)
- f) Management needs to host the company website in one of the available servers. Is it possible? Explain your answer. (05 Marks)

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