EASTERN UNIVERSITY, SRI LANKA

DEPARTMENT OF MATHEMATICS

THIRD EXAMINATION IN SCIENCE –2014/2015

SECOND SEMESTER (Dec., 2017/ Jan., 2018)

CS303 – INTERNET AND MULTIMEDIA APPLICATIONS

Answer All Questions   **Time: Two Hours**

Q1)

   a) Define the term internet and describe the uses of internet. [10%]

   b) Briefly describe the address format of IPv4 and IPv6. [15%]

   c) End systems are connected together by communication links. Links are made up of different types of physical media. Briefly describe three types of physical media. [15%]

   d) Briefly describe the following two approaches:

      i) Dual Stack approach;

      ii) Tunneling approach. [20%]

   e) Briefly describe each layers of TCP/IP Reference Model. [10%]

   f) Write short notes on the followings: [30%]

      i) Internet Service Provider (ISP);

      ii) Address Resolution Protocol (ARP);

      iii) Topology of the Internet;

      iv) Transmission Control Protocol (TCP);

      v) User Datagram Protocol (UDP).

Q2)

   a) State three problems and the solutions of classful IP address. [15%]

   b) Define what a subnetting is and explain the needs of subnetting with the aid of an example.

      [15%]

   c) Illustrate Classless Inter-Domain Routing (CIDR) with an example of a class B address.

      [15%]

d) Consider an organization that needs to connect 120 hosts to the internet. Explain how to choose the most appropriate IPV4 class in classful address. [10%]

e) An organization has been assigned the class C network address 198.42.17.0, but only has 60 nodes to connect to the internet.

    i)   Find the Maximum subnets and hosts in this class C address

    ii) Determine the IP address of subnet 3 and its usable host range

    iii) State in which subnet the address 198.42.17.130 belongs to [25%]

f) Determine, whether the following hosts are on the same subnet or different subnets:

    i)   IP address of host A 172.16.17.30/20 and the host B 172.16.28.15/20;

    ii) IP address of host A 192.168.0.10/24 and the host B 192.168.20.2/24. [20%]

Q3)

a) Define what Hyper Text Transfer Protocol (HTTP) is and explain why HTTP is called a stateless protocol. [15%]

b) Distinguish between persistent and non-persistent connections. [15%]

c) Consider the url "http://www.esn.ac.lk/science/maths/comp.html", and write the series of steps to fetch this site using non-persistent connection. (This page consists of a base HTML file and 3 JPEG images.) [20%]

d) Describe the terms Round-Trip-Time (RTT) and three-way handshake. [15%]

e) Describe each of the three HTTP request methods with the aid of suitable examples. [25%]

f) Consider the following string of ASCII characters that were captured by Wireshark when a browser sent an HTTP message.

> HTTP/1.1 200 OK
> Connection: close
> Date: Tue, 09 Aug 2011 15:44:04 GMT
> Server: Apache/2.2.3 (CentOS)
> Last-Modified: Tue, 09 Aug 2011 15:11:03 GMT
> Content-Length: 6821
> Content-Type: text/html
> (data data data data data ...)

Explain the meaning of each components in the above message. [10%]

Q4)

   a) Write short notes on the followings:

      i)   Simple Mail Transfer Protocol;

      ii) Post Office Protocol;

      iii) File Transfer Protocol;

      iv) Cookies;

      v) Web caching.   [25%]

   b) Briefly describe the scenario of sending an e-mail from a person Bob to Bubby.   [20%]

   c) A browser (i.e., an HTTP client), running on a user's host, requests the URL www.someschool.edu/index.html. State the role of Domain Name Server here and describe the steps clearly.   [10%]

   d) Explain the needs of data compression in a multimedia system and List two types of data compression methods.   [15%]

   e) Apply the Lempel-Ziv-Welch (LZW) compression algorithm to compress the following string: "LMNOLMNLMNNLMNPLMNQ"   [15%]

   f) Briefly describe the Run Length Encoding (RLE) data compression technique with suitable examples.   [15%]