



RAJARATA UNIVERSITY OF SRI LANKA

FACULTY OF APPLIED SCIENCES

BSc Degree in Information & Communication Technology

Second Year Semester II Examination – April/ May 2016

ICT 2406 – Internet Programming

Answer All Questions

Time: THREE (3) hours

Q1.

- What is Internet? Explain using the two views. (4 marks)
- What is an "End System"? End systems that are connected to the Internet are also referred to as "Hosts". Explain Why? (2 marks)
- What are the two fundamental interaction models in end systems? (2 Marks)
- What is BitTorrent protocol? Explain how it works. (3 marks)
- What is an ISP? (2 marks)
- Packet Switching and Circuit Switching are data transfer methods through a network in network core. Compare and contrast Packet Switching with Circuit Switching. (3 marks)
- To provide structure to the design of network protocols, network designers organize protocols and the network hardware and software that implement the protocols in layers. What are the layers in Internet Protocol Stack? Give the main functionality of each layer and the protocol data unit (PDU) in each using following table. (4 marks)

Layer Name	Main Function	PDU

Total (20)

Q2.

- a) Give three examples for network applications and give one protocol used in each. (2 marks)
- b) HTTP is stateless. Explain. (2 marks)
- c) Explain the web cache's role when requesting a web page? What are the advantages of web caching? (4 marks)
- d) What is a Mail Access Protocol? Explain the need of a Mail Access Protocol. (2 marks)
- e) Explain what DNS is and its importance. (2 marks)
- f) Compare and contrast FTP with HTTP (4 marks)
- g) Write a short note on ICMP. (4 marks)

Total (20)

Q3.

- a) Compare and contrast the two main protocols in transport layer. (4 marks)
- b) Describe why an application developer might choose to run an application over UDP rather than TCP. (2 marks)
- c) Draw IPV4 Datagram Format and explain the functionality of any five fields. (4 marks)
- d) Give two methods use to extend the IPV4 address space. (2 marks)
- e) What is fragmentation and reassembly? Why fragmentation and reassembly is required in network layer? (2 marks)
- f) Explain why DHCP is said to be a plug-and-play protocol. (2 marks)
- g) What is Network Address Translation (NAT)? State two problems in NAT. (4 marks)

Total (20)

Q4.

- a) In socket programming using TCP, no destination IP is required when sending packets. Explain why? (2 marks)
- b) Give two protocol analyzing tools. (2 marks)
- c) Socket programming with TCP require 2 sockets while UDP only use 1 socket. Explain why we use two sockets in when using TCP? (2 marks)
- d) What happens if you run TCP client before TCP Server? Why? (2 marks)
- e) What is a distributed system? (2 marks)
- f) Write client and server socket programs to the following application.
 1. The client reads a number (X) from its keyboard and sends the data to the server.
 2. The server receives the data and calculate the factorial (f) of that number.
 3. The server sends the factorial (f) to the client.
 4. The client receives it and displays the following line on its screen.
 5. "The factorial of X is: f"

(10 marks)**Total (20)**

Q5.

- a) Complete the table given below related to classful addressing.

Class name	Number of network bits	Number of host bits
A		
B		
C		

(2 marks)

- b) Find classes of the following IP addresses when classful addressing is used.

i. 95.12.14.87

ii. 156.45.23.0

(2 marks)

- c) What is subnetting? Subnetting does not give more addresses, instead it reduces the addresses. Explain.

(2 marks)

- d) Compare the 1
- st
- and the 2
- nd
- IP addresses using the given mask and identify whether they are in the same network or not.

(2 marks)

1 st IP Address	2 nd IP Address	Mask	Same Network or Not
192.168.0.5	192.168.0.100	255.255.255.192	
192.168.0.5	192.168.0.100	/25	

- e) i. Convert to dotted decimal format

11011010 10001110 01010010 00011000

(1 mark)

- ii. Convert to binary format

196.164.65.100/24

(1 mark)

- f) 192.224.240.0/21

ABC Company is assigned the above IP block. They need 8 subnetworks inside the organization.

- i. How many bits required to create 8 subnetworks? What is the subnetmask?

(2 marks)

- ii. Give first 4 subnetwork addresses.

(4 marks)

- iii. 1
- st
- available host address of each subnetwork mentioned above.

(4 marks)

Total (20)