RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. Information Technology
Second Year - Semester II Examination – January / February 2023

ICT 2406 – INTERNET PROGRAMING

Time: Three (03) hours

- There are two (02) parts in three (03) pages.
- Provide short answers for **All** questions in Part 01.
- Answer **All** questions in Part 02

Part 01

1. Suppose that the Host1 application that initiated the TCP connection has data to be sent to Host2. Explain whether Host1's SYN segment can carry the data. (02 marks)
2. How does the sending host know if the destination is local or remote with respect to its immediate network? (02 marks)
3. What is the fundamentals of internet routing? (02 marks)
4. Identify the class and default subnet mask of the IP address 217.65.10.7 in classful addressing. (02 marks)
5. What is flow Control? (02 marks)
6. What is OSI? (02 marks)
7. What is multicast? What is the motivation for developing multicast? (02 marks)
8. For which fields is the UDP checksum calculated? Why? (02 marks)
9. What are the functions of transport layer? (02 marks)

10. You have the following address: 192.16.5.133/29. How many total bits are being used to identify the network, and how many total bits identify the hosts?

(02 marks)

11. What is http 404 not found response code?

(02 marks)

12. Write down two (02) advantages and two (02) disadvantages of distributed systems.

(02 marks)

13. What are the conditions for serializability?

(02 marks)

14. What is Round Trip Time (RTT)? Use a time diagram to illustrate your answer.

(02 marks)

15. Which field in the IP header can be used to ensure that a packet is forwarded through no more than N routers?

(02 marks)

Part 02

1. a) What are the metrics used in determining the best path for a routing protocol?

(03 marks)

b) What constitutes a Socket? How do server sockets and client sockets differ?

(03 marks)

c) Describe how web caching can reduce the delay in receiving a request object. Will web caching reduce the delay for all objects requested by a user or for only some of the object? Why?

(04 marks)

d) Assume host X's window size is 6 and segments 5001 through 5006 have already been sent. Host X then receives an ACK with ACK sequence number set to 5003. Segments 5007 through 5011 are waiting to be transmitted by host X.

Draw the time diagram showing this scenario depicting which segments, if any, X can transmit after getting the ACK with ACK sequence number set to 5003, and explain why?

(15 marks)

2. a) What are the advantages and disadvantages of java socket?

(02 marks)

b) Briefly describe packet switching and circuit switching techniques.

(03 marks)

c) Explain how names are translated (resolved) into IP address?

(05 marks)

d) How would you create an input stream and output stream? Write down the code.

(15 marks)

3. a) What is real-time transport protocol (RTP)? Why are they important? (03 marks)

b) What are the difference between Get and Post method? (03 marks)

c) Suppose you want to do a transaction from a remote client to a server as fast as possible. Would you use UDP or TCP? Why? (04 marks)

d) You have sub-netted your class C network 192.168.1.0 with a subnet mask of 255.255.255.240. List the following:

i. Number of networks (02 marks)
ii. Number of hosts per network (02 marks)
iii. Full range of the first three networks, (03 marks)
iv. Usable address range from those first three networks. (03 marks)

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