Name ..... ID ..... Section ..... Seat No .....

Sirindhorn International Institute of Technology
Thammasat University

Final Exam Answers: Semester 1, 2013

Course Title: ITS323 Introduction to Data Communications

Instructor: Steven Gordon

Date/Time: Tuesday 15 October 2013; 9:00–12:00

Instructions:

- This examination paper has XX pages (including this page).
- Conditions of Examination: Closed book; No dictionary; Non-programmable calculator is allowed
- Students are not allowed to be out of the exam room during examination. Going to the restroom may result in score deduction.
- Turn off all communication devices (mobile phone etc.) and leave them at the front of the examination room.
- Write your name, student ID, section, and seat number clearly on the front page of the exam, and on any separate sheets (if they exist).
- The examination paper is not allowed to be taken out of the examination room. A violation may result in score deduction.
- Reference material included at the end of the exam may be used.

Question 1 [3 marks]

Multiple choice. Circle only one answer. 1 mark for a correct answer. 0 marks for an incorrect answer or no answer.

(a) Question text

i. Answer option 1
ii. **Answer option 2**
iii. Answer option 3
iv. Answer option 4
v. Answer option 5
vi. Answer option 6

(b) Question text

i. Answer option 1
ii. Answer option 2
iii. **Answer option 3**
iv. Answer option 4
v. Answer option 5
vi. Answer option 6

(c) Question text

i. Answer option 1
ii. Answer option 2
iii. Answer option 3
iv. Answer option 4
v. **Answer option 5**
vi. Answer option 6

Question 2 [12 marks]

Question description

(a) What is the value of . . . ? [1 mark]

Answer. *Answer text*

(b) What is the value of . . . ? [2 marks]

Answer. *Answer text*

Question 3 [11 marks]

Consider the network in Figure 1.

Figure 1: Network Topology

Assume flooding is to be used in the network to deliver a data packet from node H to node G.

(a) What is the optimal value of . . . ? [3 marks]

Answer. *Answer text*

Assume instead of flooding, adaptive routing . . .

(b) Draw the optimal . . . [5 marks]

Answer. *Answer text*

Question 4 [12 marks]

Assuming classless IP addressing is used, answer the following questions by writing your answers in the table. Unless otherwise stated, give all IP addresses in dotted decimal notation.

(a) For a host with IP address 83.28.171.7/13: [3 marks]

i. What is the network address?

ii. What is the directed broadcast address?

(b) For a host with IP address 21.103.46.1 and subnet mask 255.255.255.192: [4.5 marks]

i. What is the network address?

ii. What is the directed broadcast address?

iii. What is the maximum number of IP devices that can attach to this subnet?

(c) A host does not yet have an IP address configured, nor does it know its network address. [4.5 marks]

i. Give an IP address that the host can send to in order to send to itself.

ii. Give an IP address that the host can send to in order to deliver an IP datagram to all nodes on its subnet.

iii. For the case of part (ii), give the source address of the IP datagram.

Question	*Answer*
(a) i.	*83.24.0.0/13*
(a) ii.	*83.31.255.255/13*
(b) i.	*21.103.46.0/26*
(b) ii.	*21.103.46.63/26*
(b) iii.	$2^6 - 2 = 62$
(c) i.	*127.0.0.1*
(c) ii.	*255.255.255.255*
(c) iii.	*0.0.0.0*

Reference Material

Selected well-known ports:

- FTP 20 and 21
- SSH 22
- Telnet 23
- SMTP 25
- DNS 53
- HTTP 80
- HTTPS 443

Selected Protocol numbers:

- 1 ICMP
- 6 TCP
- 17 UDP

Selected HTTP Status Codes:

- 200 Ok
- 304 Not Modified
- 401 Unauthorized
- 404 Not Found