



UNIVERSITY OF GHANA, LEGON

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BACHELOR OF SCIENCE IN ENGINEERING FIRST SEMESTER EXAMINATIONS: 2015/2016

DEPARTMENT OF COMPUTER ENGINEERING CPEN 305: COMPUTER NETWORKS (3 CREDITS)

INSTRUCTION: ANSWER ALL QUESTIONS (i.e. total of 4 questions)

TIME ALLOWED: TWO AND A HALF (21/2) HOURS

1.

a. With the help of a diagram, explain the different stages involved in the exchange of data and control frames in time, between a source and destination using CSMA/CA.

(7 Marks)

b. Match the following to one or more layers of the OSI model

i.	Route determination	(1 Mark)
ii.	Flow control	(1 Mark)
iii.	Interface to transmission media	(1 Mark)
iv.	Provision of access to the end user	(1 Mark)

- c. State the main functions of each layer of the TCP/IP model
- (5 Marks)
- d. A 280-byte message is sent through a private internet using the TCP/IP protocol suite. If the protocol adds a 20-byte header at each layer, what is the efficiency of the system (ratio of the number of useful bytes to the number of total bytes). (4 Marks)

2.

a. Find the subnet mask in each of the following cases:

(6 Marks)

- i. 1024 subnets in class A
- ii. 256 subnets in class B
- iii. 32 subnets in class C
- iv. 4 subnets in class C
- b. In a class A subnet, we know the IP address of one of the hosts and the subnet mask as given below:

 (4 Marks)

EXAMINER: MR. AMEVI ACAKPOVI

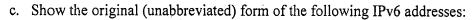
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IP Address: 25.34.12.56 Subnet mask: 255.255.192.0

		i.	What is the first address ((subnet address)?			
		ii.	What is the last address?		yd y de general en		
				4	7. 4.		
	c.	In a class C subnet, we know the IP address of one of the hosts and the subnet mask as					
			below:		(4 Marks)		
		, i	IP Address: 202.44.82.1	16 Subnet mask:	255.255.255,240		
		i.	What is the first address (200.200.200.210		
		ii.	What is the last address?	3°2 .			
			*	*			
	d.	Inab	lock of addresses, we know	that the IP address of one	host is 25 34 12 56/16		
		In a block of addresses, we know that the IP address of one host is 25.34.12.56/16. i. What is the first address (network address) in this block?					
		ii.		limited broadcast address)			
			What is the last address (initiod broadcast address)			
3.					(6 Marks)		
٥.	,	An or	conjection is granted the bl	look 120 56 0 0/16. The od			
	a.	ministrator wants to create					
			subnets. Find the following		(10 Marks)		
		i. 	the subnet mask				
	ii. the number of addresses in each subnetiii. the first and the last address in the first subnet						
		iii.					
		iv.	the first and the last addre	ess in the last subnet (subne	t 1023)		
	b. Knowing the backbone network in Internet can be switched WANs, briefly d						
	b.						
		the following switched WAN technologies:			(6 Marks)		
		i.	X25				
		ii.	ATM	,			
		iii.	Frame Relay				
	c.	Discu	ss the differences between	a router and a switch.	(4 Marks)		
4.	a.	a. Discuss two (2) main reasons for the adoption of the new protocol IPv6. (4 Marks)					
	b.	Discu	ss two (2) differences betw	een the IPv4 and IPv6 head			
					(2 Marks)		
		•		·	(a marks)		
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i.

ii. 0::2

iii. 0:23::0

::

iv. 0:A::3

v. 123::12:23

vi. B:A:CC::1234:A

(6 Marks)

d. As a network administrator, you are requested to configure access to some services located on a remote server by using either TELNET or SSH. Briefly compare the two protocols and justify your choice (4Marks)

e. Compare SCTP protocol to

(4 Marks)

i. UDP protocol

ii. TCP protocol

