Student name:	Student ID:



PRINCE OF SONGKLA UNIVERSITY FACULTY OF ENGINEERING

Final Examination:	Semester II	Academic	Year:	201	. 1

Date: 24-02-2012 Time: (3 hrs) 09.00 - 12.00

Subject: 241-553 High Speed and Broadband Integrated Networks Room: R200

- In this exam paper, there are 18 questions,
- No notes and books are allowed,
- Answers could be either in Thai or English,
- All electronic devices are not allowed,
- Try to attempt answering all questions.

1.	Gigabit Ethernet	operates	in	2	modes:	shared	access,	and	dedicated-access.	Answer	the
	following question	ns:								1.0	

1.1 Gigabit Ethernet uses CSMA/CD for shared-access with 2 important modifications. What are they? (10 marks)

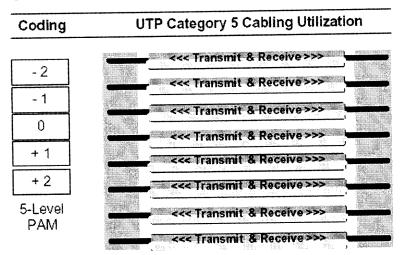
1.2 In dedicated-access topology enhancement, this mode is used for point-to-point connection and operated as full-duplex. What are the significant features? (10 marks)

<u>Answer</u>
Allswei
••••••

	Student name:	Student ID:	2
		•••••	
2. a)	How does "Carrier Extension" work? (5 marks) b) Why does Gigabit Ethernet need carrier extension?	(5 marks)	
Answ	<u>ver</u>		
		•••••	
• • • • • •			
•••••			
•••••			
		•••••	
e:	When Gigabit Ethernet operates in full-duplex moxtension and frame bursting) is disabled. It introduces Pause Protocol". Please explain how the Pause Protoco	es link-level flow control, the so call	ier led
Ansv	<u>wer</u>		
•••••			
•••••			
•••••			
•••••			
•••••			
• • • • •			
• • • • •			

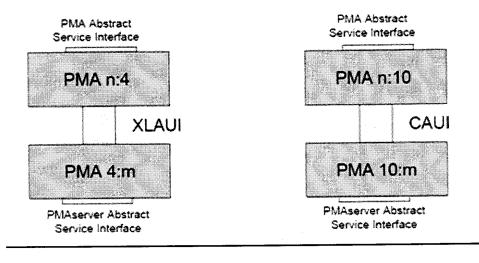
4. The picture below shows 1000BASE-T using UTP Category 5. Please explain how Gigabit Ethernet can generate 1 Gbps speed on this cable. (10 marks)

1000BASE-T



<u>Answe</u>	<u>r</u>						
					• • • • • • • • • • •		
		• • • • • • • • • • • • • • • • • • • •	 • • • • • • • • • • • • •	 	 	• • • • • • • • • • •	• • • • •

5. Below are shown the 40 Gigabit Ethernet and 100 Gigabit Ethernet Protocol Architectures. Please explain how each works, show their differences of traffic lanes mapping (10 marks)



Student	name:	Student ID:	4				
Answer:							
			•••••				
			•••••				
	•••••		•••••				
6 The table	e below is a comparison between 100	0Base-T and 10GBase-T. What are A	, B, and C?				
(5 marks							
\	1000BASE-T	10GBASE-T					
	5-level coded PAM signaling	Λ					
	(2 information bits/symbol)	Α					
	8-state 4D Trellis code across pairs	8-state 4D Trellis code across pairs					
	Full duplex echo-cancelled transmission	В					
	125 Mbaud, ~80 MHz used bandwidth	833 Mbaud, ~450 MHz used bandwidth					
	No FEXT Cancellation	С					
<u>Answer</u>							
• • • • • • • • • • • • • • • • • • • •			•••••				
7. 10G uses 4 pairs in each cable (same as 1000BASE-T). The encoding uses 3 information bits per symbol (baud) with baud rate: ~833 MBaud. Please explain how 10G can achieve 10 Gbps. (10 marks)							
Answer							
		••••••					
			•••••				

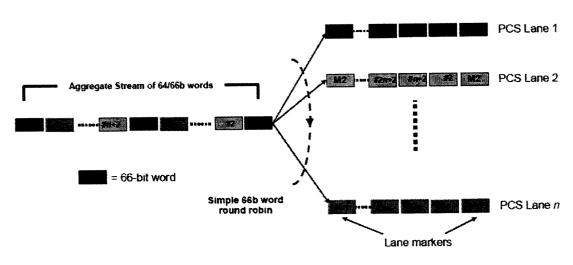
Student name:	, Student ID:	5

8. The table below is a comparison between 1000Base-T and 10GBase-T What are A, B, and C? (5 marks)

Feature	Gigabit Ethernet	10 Gigabit Ethernet
IEEE standard	802.3z	802.3ae
Media support	Copper and optical fiber	Optical fiber
Mode(s) of operation	Half and full duplex	(A)
Coding scheme	(B)	64B/66B
PMD layer	From fiber channel	New
Transmission range	5 km	40 km
SONET/SDH attachment	(C)	Yes

Answer	

9. In 100 G Ethernet, "Multilane Distribution (MLD)" is used. The MLD scheme implemented in the PCS is fundamentally based on a striping of the 66-bit blocks across multiple lanes. Please explain, how 100 G Ethernet can achieve 100 Gbps. (5 marks)



<u>Answer</u>			
	• • • • • • • • • • • • • • • • • • • •	 	 ••••••

Student na	ame:		Student ID:	
Old Gont No				
				•••••
10. The picture and its char	below shows a stacteristics. (10 m	series of 10G Ethernet. Pharks)	lease describe each p	hysical medium use
	· ·			
	***************************************	Media Access Cont Full Duplex	rol	
		10 Gigabit Media Independent Int 10 Gigabit Attachment Unit In	terface (XGMII) or	
L		10 digatik Addominan olar w		
Ī			Serial	
TOTAL PROPERTY OF THE PROPERTY	WWDM LAN PHY (8B 10B)	Serial LAN PHY 64B/66B	WAN PHY (64B/66B+W	

ſ		Serial Serial Serial	Serial Serial	Serial
	WWMD PMD 1310 nm	Serial Serial PMD PMD	PMD PMD 850 nm 1310 nm	PMD
•	-LX4	-SR -LR -ER	-SW -LW	-EW
Answer				
	•••••			
		• • • • • • • • • • • • • • • • • • • •		
		• • • • • • • • • • • • • • • • • • • •		
• • • • • • • • • • • • • • • • • • • •				

S	Student name: Student ID:	7					
	ar is connecting to the Internet. What happens when the car is moving? In cases of: - Change of point of attachment, - Change of IP sub-network						
	uch cases, what are the problems? (10 marks)						
Ans	<u>swer</u>						
12. Wh	nat is the main difference between MIPv6 and NEMO?						
13. Below is a scenario of using MIPv6. MN just moved to into the visited network. Please describe the signal flow showing s how MIPv6 works in this scenario.							

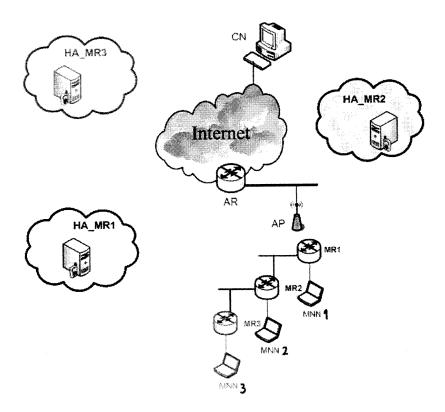
Student name:	Internet	Visited network	8
14. Please give 3 reasons why Answer	we need HA in MIPv6.		
		•••••	
			• • • • • • • • • •

Answer

15. Please describe how the triangular routing problem happens in MIPv6 Answer
16. Please give your analysis of how many round trips are needed during hand over period until MN

Student name:		Student	: ID:	9
				• • • • • • •
				• • • • • • •
		••••••••	•••••	•••••
•••••				
•••••				
17. The picture shows a scenario Home Link to a Foreign Mobile Nodes (MNN) a	Link. Please described CN. Home Agent	Internet AR	Foreign Link WR'S COA = B MR'S COA = B MNP = P	1 from its tween
Answer				
		•••••		•••••
				• • • • • • • •
			•••••	•••••
	•••••••••••••••••••••••••••••••••••••••			

- 18. This question is based on NEMO.
 - a. Please draw the link paths where data from CN to MNN3 flows (to show that how pinball routing problem occurs).



b. List problems and disadvantages of pin ball routing

Answer