## **Assignment Submission Coversheet**

Plagiarism occurs when a student passes off as the students own work, or copies without acknowledgement as to its authorship, the work of another person. Collusion occurs when a student obtains the agreement of another person for a fraudulent purpose with the intent of obtaining an advantage in submitting an assignment or other work. Work submitted may be reproduced and/o communicated for the purpose of detecting plagiarism and collusion.  DECLARATION  Lertify that the attached work is entirely my own (or where submitted to meet the requirements of an approved group assignment, is the work of the group), except where work quoted or paraphrased is acknowledged in the text. I also certify that in has not been previously submitted for assessment in this or any other unit or course unless permissions for this has been granted by the Unit Chair of this unit. I agree that Deakin University may make and retain copies of this work for the purposes of marking and review, and may submit this work to an external plagiarism-detection service who may retain a copy for future plagiarism detection but will not release it or use it for any other purpose.  Signed: Justin Bland  Date: Friday, August 30, 2019  An assignment will not be accepted for assessment if the declaration appearing above has not been signed by the author. If submitting electronically, print your full name in place of a signature.	Faculty	of Science	e, Engineering and Built E	nvironment		
Assignment Title:   Problem Solving Report 2   Problem Solving Report 2	Student II	<b>)</b> :	218478549			
Assignment Title: Problem Solving Report 2  Due Date: August 30 <sup>th</sup> 2019 Assessment Item: 2  Course Code/Name: S314 / Bachelor of Cyber Security  Unit Code/Name: SIT202 Computer Networks   Unit Chair / Campus Coordinator:   Prof Jinho Choi    If this assignment has been completed by a group or team:  1. Each student in the group must complete and sign a separate coversheet 2. The assignment will be returned to the student in the group nominated below  Assignment to be returned to: (Student name and Student 10 number)  Plagiarism occurs when a student passes off as the students own work, or copies without acknowledgement as to its authorship, the work of another person. Collusion occurs when a student obtains the agreement of another person for a fraudulent purpose with the intent of obtaining an advantage in submitting an assignment or other work. Work submitted may be reproduced and/o communicated for the purpose of detecting plagiarism and collusion.  DECLARATION  Lectrify that the attached work is entirely my own (or where submitted to meet the requirements of an approved group assignment, is the work of the group), except where work quoted or paraphrased is acknowledged in the text. I also certify that it has not been previously submitted for assessment in this or any other unit or course unless permissions for this has been grantee by the Unit Chair of this unit. I agree that Deakin University may make and retain copies of this work for the purposes of marking and review, and may submit this work to an external plagiarism-detection berwice who may retain a copy for future plagiarism and reterion but will not be accepted for assessment if the declaration appearing above has not been signed by the author. If submitting electronically, print your full name in place of a signature.  COMMENTS	Student Name:		Justin Bland			
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electronically, print your full name in place of a signature.  COMMENTS	Signed:	Justin Bland		Date:	Friday, August 30, 2019	
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Mark Awarded: Assessor's Signature: Date:			Assessor's Signature:		Date:	

## Question-1 (Chapter 18): 12 marks

1. In current classful addressing, there are 5 classes as shown in Fig. 18.18 (p. 531 of the textbook). There are 5 classes with variable-length leading bits as follows:

Class A: 0; Class B: 10; Class C: 110; Class D: 1110; Class E: 1111

• Suppose that we wish to modify to accommodate 9 classes. What are 9 (variable-length) leading bits for them? [4 marks]

Class	Leading Bit
Class A	0
Class B	10
Class C	110
Class D (Reserved)	1110
Class E (Reserved)	1111
Class F	11110
Class G	11111
Class H	1111110
Class I	1111111

- 2. [8 marks] A classless address is given as 200.107.16.17/20
  - Find the first and last addresses in the block (explain in detail how you can find them). [4 marks]

Address given in binary 11001000.01101011.0001 0000.00010001

The IP range for address given should always start with the first 20 bits so to find the first and last IP for this range we change all the bits after the 20<sup>th</sup> bit to all zeros for the first and all ones for the last address in the range.

First IP: 11001000.01101011.0001 0000.00000001 - 200.107.016.001 Last Usable IP: 11001000.01101011.0001 1111.1111111 - 200.107.031.254 Broadcast IP: 11001000.01101011.0001 1111.1111111 - 200.107.031.255

Find the mask. [4 marks]

Mask: 11111111.11111111111110000.0000000 - 255.255.240.000

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## Question-2 (Chapter 20): 20 marks

Consider the network consisting of 5 nodes.

1. Find the distance vectors for all the nodes. [8 marks]

	Α	В	С	D	E
Α	0	1	3	3	4
В	1	0	4	2	4
С	3	4	0	6	1
D	3	2	6	0	6
E	4	4	1	6	0

2. Can the maximum distance of the network (the maximum distance between any pair of different nodes, i.e., {A,C}, {A,D}, {B,C}, etc) be lowered if the distance between nodes B and E becomes 2? Please explain how you come to the answer (Yes or No). [4 marks]

If the distance between nodes B and E become 2, the distance between multiple nodes would be reduced, see adjusted distance vector table below

	Α	В	С	D	E
Α	0	1	3	3	3
В	1	0	3	2	2
С	3	3	0	5	1
D	3	2	5	0	4
E	3	2	1	4	0

3. Find the maximum distance of the network if the link between nodes A and C is removed. In addition, discuss what is the performance loss after losing the link between nodes A and C. [8 marks]

	Α	В	С	D	E
Α	0	1	6	3	5
В	1	0	5	2	4
С	6	5	0	7	1
D	3	2	7	0	6
E	5	4	1	6	0

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## Question-3 (Chapters 23 and 24): 13 marks

1. Choose "True" or "False" for each item [3 marks]

	True or False
In the transport layer, port numbers are used to identify local computers.	True
For flow control, we need two buffers: one at the sending transport layer and the other at the receiving transport layer.	True.
There are only connection-oriented protocols in the transport layer, while the network layer supports connectionless communication.	False

- 2. [6 marks] Suppose that the Go-Back-N protocol with m=3 and the sending window of size 7 is used to send packets. Let  $S_f = 31$ ,  $S_n = 35$ , and  $R_n = 33$ .
  - a) What are the sequence numbers of the data packets in transit? [2 marks]
  - b) what are the acknowledgement numbers of ACK packets in transmit? [2 marks]
  - c) if the senders process sends two or more data packets to the sender's transport layer and one ACK packet is received from the receiver's transport layer, what are the updates values for  $S_f$  and  $S_n$ ? [2 marks]
- 3. [4 marks] The following is part of a TCP header in hexadecimal format:

93E2 B017 0AB2 0000 ...

What is the destination port number? [2 marks]

Destination Port Hex B0 17

Dec 45079

What is the sequence number? [2 marks]

Sequence Number Hex 0A B2 00 00

Dec 179437568

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