National College of Ireland

NATIONAL COLLEGE OF IRELAND

B.Sc. Honours in Computing, Year 3 (BSHC3A)

B.Sc. Honours in Computing (Evening), Year 3 (BSHC3A)

Semester 1 Examinations

Start Time: December 2nd 2024

Submission time: January 3rd 2025 23:55

Advanced Computer Networks

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TABA instructions

1. This is an open book TABA
2. All work submitted should be your own
3. Answer Section 1, Section 2 and Section 3 (see further details below)
4. **You are not allowed to discuss your solution with anyone except the lecturer or a member of staff during the examination. If it is found that a student has discussed his/ her solution with other students, the case will be referred to disciplinary committee for further actions.**
5. You are allowed to use your class notes. If the lecture notes are used as a resource for this assignment, do not copy them directly but rather paraphrase them (write in your own words).
6. This is partly a Turnitin assignment, and the plagiarism will be checked based on Turnitin database. It will be used to check whether a text is copied from Internet, any other source or peer students.
7. Use a single column layout document.
8. Font size for the body of the text should be 12-point Times New Roman/ Arial.
9. Include student name, student ID and course name at the top of the first page.
10. The question number being addressed must be clearly indicated in your submission document.

Instructions Section 1:

- You must attempt **ALL** questions in Section 1
- Required files for Section 1 can be found on Moodle in the section "Assessment and Feedback > TABA Files"

Instructions Section 2:

- Section 2 consists of two primary questions.
- You must attempt **all questions** presented.
- Required files for Section 2 can be found on Moodle in the section "Assessment and Feedback > TABA Files"

Instructions Section 3:

- Section 3 consists of 10 multiple choice questions via a Moodle quiz
- The Moodle quiz can be found on Moodle under the section "Assessment and Feedback > TABA Questions"
- Attempt **ALL** questions.

Submission Instructions:

All work must be submitted via Moodle

Work should be submitted via the designated links as per below:

Section 1. You must submit all answers in a single MS Word (or PDF) file. You may copy and paste your answers into a single file. Your submission must include:

a. Your diagram of a three way handshake
b. Your answers to questions in part B and C

Section 2.

Part A – You must submit a packet tracer file containing your 'fixed' network. Please submit a .pkt file to the upload under the section "Assessment and Feedback > TABA Submission Links"

Part B – You must submit your answers to the questions presented. This can be in MS Word or PDf format. They may be included in the same file that was used to answer questions from the previous section.

Section 3.

No file submission required. Complete the multiple choice quiz on Moodle.

SECTION 1 - TCP/IP NETWORKING – WIRESHARK

ATTEMPT ALL QUESTIONS IN SECTION 1.

(30 marks total)

Instructions:

1. Browse to the module Moodle page.
2. Download the ***TABA – Wireshark file.***
3. Open this file in Wireshark
4. Answer the following questions

A. Draw a diagram of the three-way handshake that takes place when connecting to the http://www.computerweb4u.ie Use the raw sequence numbers, that you will find by analysing the Wireshark file, in your diagram.

Note on Submission: It is acceptable to draw the diagram using pen and paper and submit a photo of your completed drawing. You may alternatively use a diagramming tool if you prefer and submit an image/screenshot of your diagram.

(10 marks)

B. Find the second HTTP get request for the host *http://www.computerweb4u.ie/*

a. What is the host and port? **(2.5 marks)**
b. What is the *user agent* ? **(2.5 marks)**
c. What encoding is accepted ? **(2.5 marks)**
d. What frame number in Wireshark contains the response to this GET request? **(2.5 marks)**

C. Find the response packet that the server sent when replying to the initial GET request that you found in part (B)

a. What is the content type? **(2 marks)**
b. What is the access control allow method ? **(2 marks)**
c. What is the server ? **(2 marks)**
d. What is the content length ? **(2 marks)**
e. What time since the request ? **(2 marks)**

SECTION 2- PRACTICAL NETWORKING

ATTEMPT ALL QUESTIONS IN SECTION 2

(40 marks total)

Part A - Network Troubleshooting using Packet Tracer

(30 MARKS)

Instructions

1. Browse to the module Moodle page.
2. Download the ***TABA – Packet Tracer File***
3. Open this file in Packet Tracer
4. Troubleshoot the provided network
5. Answer the questions at the end of this section

Scenario:

As the senior networking engineer in your company, you have been tasked with troubleshooting and resolving any networking issues in the company's internal networks. Currently, various employee devices cannot communicate with each other, and they are complaining that they cannot complete their work and projects on time.

Troubleshoot and fix the network such that:

- All departments end devices (PC/Laptops/servers) can communicate to all other departments end devices (PC/Laptops/servers)
- Each department can access each of the other departments websites
- All devices are configured as per the table of clients below

You have also been provided with the following network information.

Network Information

Department	Network	Subnet Mask
Engineering	10.50.20.0	255.255.255.128
Finance	192.168.30.0	255.255.255.192
Sales	10.0.10.0	255.255.255.0
HR	192.168.100.0	255.255.255.224
Routing Net 1	172.20.0.0	255.255.0.0
Routing Net 2	172.21.0.0	255.255.0.0
Client Information		
Client	**Department**	**Configuration Type**
eng-PC0	Engineering	DHCP
eng-PC1	Engineering	Static
eng-Laptop0	Engineering	DHCP
fin-PC0	Finance	DHCP
fin-Laptop0	Finance	DHCP
fin-PC1	Finance	DHCP
sales-PC0	Sales	DHCP
sales-Laptop0	Sales	DHCP
sales-PC1	Sales	DHCP
hr-PC1	HR	Static
hr-PC2	HR	DHCP
hr-PC3	HR	DHCP

Part B – Questions relating to Part A

(1**0 marks)**

Question 1:

There are currently 6 PCs and one server on the Engineering Team network. Why is it not possible to add any more PC's/Laptops using DHCP to the Engineering Team Network?

(3 marks)

Question 2

List the steps you would take and any configuration changes you believe are necessary in order to allow you to add more devices to this network and have them automatically be configured using DHCP.

Note: a bulleted list outlining the configuration changes list will be sufficient. Students do not need to configure these changes in the packet tracer file.

(3 marks)

Question 3:

The business has decided to downsize the Finance team. As a result, the Finance manager has tasked you with reducing the size of the Finance Team network as per the below table. List the configuration changes that would be needed to reduce the size of the network, and to maintain connectivity from the PC's and servers in the Finance team with the devices in the other networks (Engineering/Sales/HR).

Team	Network	Subnet Mask
Old Network	192.168.30.0	255.255.255.192
New Network	192.168.30.0	255.255.255.224

Note: a bulleted list outlining the configuration changes list will be sufficient. Students do not need to configure these changes in the packet tracer file.

(4 MARKS)

SECTION 3 – MULTIPLE CHOICE

ATTEMPT ALL QUESTIONS IN PART 3.

(30 marks total)

Section three consists of completing a multiple choice quiz on Moodle. Please see section "Assessment and Feedback > TABA Questions" on the Moodle to find the quiz. There will be 10 questions, with each question awarded 3 marks for a correct answer. Please ensure that you have clicked the submit button upon completion of the quiz to be awarded marks for the attempt.

Please also note the following:

- Please attempt **all** questions in section 3
- There will be no negative marking for incorrect answers.
- You will have one attempt only.
- When answering the quiz questions, you may return to previous questions if required.
- Once you click on the "submit all and finish" button, and also confirm your choice to complete your quiz submission, the quiz will be closed, and no more attempts permitted. Please see the below screenshot as an example: