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## MIDTERM EXAMINATION

[Bookmark this page](#)**DISCLAIMER**

NOT SUBMITTING YOUR ANSWER WILL RESULT YOU IN GETTING ZERO IN THAT PARTICULAR QUESTION.  
WE WILL NOT BE CHECKING SAVED ANSWERS.

THERE'S ONLY ONE PAGE FOR THE EXAM.

**Points to note:**

1. If you are on your phone, try giving the exam in landscape mode.
2. If you are uploading files,
  - - - File name should contain your student ID.
  - - - Write which question you are answering in the "file description".
  - - - It can be a **PDF or Image** file. The **limit is 15MB per file**.
  - - - You can use Cam-scanner/Microsoft Word/Online converters/etc. to convert your images to PDF.
  - - - Click on "**Choose Files**" first
  - - - Write something in the **Description box** that comes **below** the "**Choose Files**" button.
  - - - Then, click on "**Upload Files**".
  - - - Mention in the answering text-field "**I have attached files to answer this question**" if you have uploaded any files. A faculty **may miss** if you don't mention.
- - - **IF YOU CAN'T UPLOAD ON BUX, UPLOAD ON YOUR GOOGLE DRIVE AND SHARE WITH YOUR FACULTY (arif.shakil@bracu.ac.bd, skazi@bracu.ac.bd, seraj.mehnaz@bracu.ac.bd). Next, paste the link in the text of the answer.**
3. All text fields and file upload fields are optional.
4. **15 Minutes extra time** has been given to submit your answers and upload files.

**Unacceptable:**

- > Plagiarized answers.
- > Email submissions.
- > Saved answers.
- > Screenshots as means to proof that you had a problem during the exam.
- > Answers not specific to the question asked.

**HONOR CODE**

0 point possible (ungraded)

**A QUICK GUIDE TO THE DO'S AND DON'TS**

The exam timer won't pause/stop once you start...

**THE DO'S**

- Submit your own work based on your own understanding.
- Report to the faculties about any suspected violation of the honor code that you are aware of.
- Save your exam progress after each submission.
- Keep a **back-up internet connection** in the form of mobile data.
- Keep your laptop/mobile phone in full charge in case of loadshedding.
- Keep your powerbank charged if required
- In case of extreme emergencies, don't panic and contact a faculty member via **DISCORD VOICE CHANNEL** (each of us will be available in a room). Any unexpected incident will be considered and taken care of.
- For joining the voice channel on Discord, wait if there's another student there.
- Finally, keep yourself relaxed and well hydrated. Take the exam as an opportunity to assess your own learnings and to identify the areas that needs improving. Good Luck!

**THE DON'TS**

- Do not search for the specific solutions to your questions on the internet.
- Do not use any **online or offline tools** or softwares to determine the answers to questions (calculators are allowed).
- Do not **share or discuss** any of the questions and/or their solutions with anyone (online or offline).
- Do not log into **any discussion platforms** such as messenger, google meet etc. (except Discord voice channel) while you are taking the exam.
- Do not panic if loadshedding or internet disruptions occur. Keep back-up options.
- Everything will be alright.

**BRAC UNIVERSITY STUDENT HONOR CODE**

You agree to the following terms by attempting the exam.

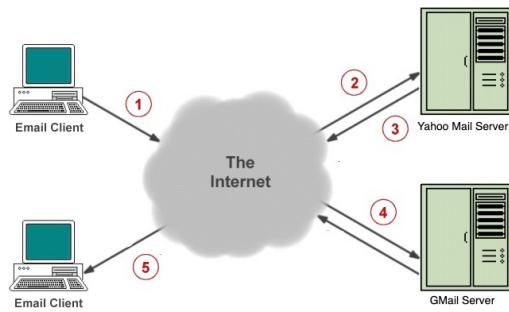
On this exam, I will not cheat, use unfair means, join intentionally or unintentionally any online or offline group in which exam answers are posted or discussed, or engage in any behavior that would commonly be deemed to be academically unethical. I will immediately notify the course teacher of any such activity or online or offline groups that I become aware of. I acknowledge that I may be suspended or expelled from Brac University if I am found to have engaged in any academically unethical behavior.

I understand that a certain percentage of students will be randomly selected for a viva after the exam and asked about their exam answers and related information and that if called for a viva, that I must appear for the viva within a designated time frame. I understand and accept that the viva may be scheduled at any point in time after I submit my answers online. I may be contacted at the email address listed below for a viva. I understand that a failure to appear for the viva after being notified at the email address below will be considered as evidence of cheating. An inability to explain my exam answers during the viva may also be considered as evidence of cheating.

I consent to video/audio recording of these viva sessions. I further recognize that non-compliance with the above may lead to further disciplinary actions that I will be ready to accept without complaint.

Submit

Show Answer



1(a) Refer to the figure above. State the email protocols used in the figure above. Replace the numbers with the protocols used and state briefly why? [5 marks]

ANSWER TO APPLICATION LAYER SQ 1

Status

You have completed this assignment. Review your grade and your assessment details.

✓ COMPLETE

▼ 1 | Your Response due Jul 30, 2021 20:05 +06 (in 0 minutes)

The question for this section

Answer to Application Layer SQ 1

Your response

Number 1.2.3 is SMTP and 4.5 is HTTP. As the email client is requesting to connect to the mail server so it is an SMTP connection for 1.2.3.4 incoming part. But in the 4 outgoing part the server is sending back the data to email client and SMTP can not do that. So HTTP pull is used for 4 sending back and 5.

Your Uploaded Files

✓ COMPLETE

2 | Staff Grade

► Your Grade: 4 out of 5

1(b) If the access utilization of a network is 40% and LAN utilization is 80%, will a proxy server be help in this case? Explain. [5 marks]

ANSWER TO APPLICATION LAYER SQ 2

Status

You have completed this assignment. Review your grade and your assessment details.

✓ COMPLETE

▼ 1 | Your Response due Jul 30, 2021 20:05 +06 (in 0 minutes)

The question for this section

Answer to Application Layer SQ 2

Your response

Proxy servers are generally used to reduce access link utilization. But in this problem our access link utilization is only 40%. So the access link has a huge overhead to work with. But a proxy server can help with reducing the RTT. If a proxy server is used here, then the RTTs that takes seconds can be reduced to milliseconds. Which will drastically reduce the RTT. But there is one caveat that it needs to be already in the proxy server. As the utilization of the access link is not that high, so the proxy server will not be of much help.

Your Uploaded Files

✓ COMPLETE

2 | Staff Grade

► Your Grade: 5 out of 5

Application Layer Math

6.66666666666667/10.0 points (graded)

You wish to access the web page "www.apexlegends.com". Since you are visiting it for the first time, the IP address is not cached in the local DNS server. By tracing, it can be seen that it required a total of 5 DNS server visits from the local server before the IP address is delivered to your PC. Furthermore, the trace shows that each RTT consumes 59 ms on average.

Finally after getting the IP address, you are able to access the website now maintaining an average RTT of 55 ms and a persistent connection without pipelining. Given, the website contains a total of 48 object(s), each object requiring 239 ms to be transferred.

ANSWER IN millisecond.

(a) What's the total RTT for resolving the IP address?

(b) What's the total RTT for fetching all the objects? (excluding DNS RTT)

14167



(c) What's the total response time to get all the objects? (include all RTTs)

14462



**Submit** You have used 2 of 2 attempts

?

Show Answer

2(a) Bob just opened two tabs in Google Chrome. What type of port address will those two tabs have and can they be the same (explain yes or no)? [5 marks]

#### ANSWER TO TRANSPORT LAYER SQ 1

##### Status

You have completed this assignment. Review your grade and your assessment details.



COMPLETE

▼ 1

Your Response due Jul 30, 2021 20:05 +06 (in 0 minutes)

The question for this section

Answer to Transport Layer SQ 1

Your response

Two tabs in chrome web browser can not have the same port address because chrome uses individual process for each tabs. Each process on a device has its own port address. As two tabs will be treated as two separate ports, the port numbers can not be the same.

Your Uploaded Files



COMPLETE

2

Staff Grade

▼ Your Grade: 5 out of 5

The question for this section

Answer to Transport Layer SQ 1

Your Response

Two tabs in chrome web browser can not have the same port address because chrome uses individual process for each tabs. Each process on a device has its own port address. As two tabs will be treated as two separate ports, the port numbers can not be the same.

Your Upload

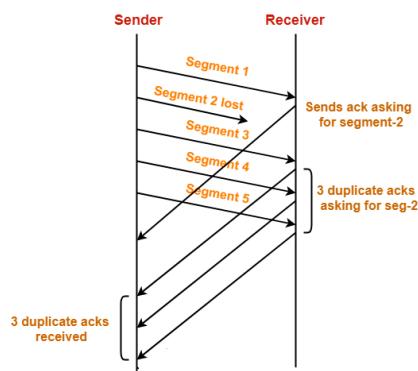
Assessments of Your Response

▼ Answer to Transport Layer SQ 1

5 / 5 POINTS

STAFF GRADE - 5 POINTS

5 Point(s) ⓘ



2(b) Refer to the above figure. Explain what is happening here and why? [5 marks]

#### ANSWER TO TRANSPORT LAYER SQ 2

##### Status

You have completed this assignment. Review your grade and your assessment details.



COMPLETE

▼ 1

Your Response due Jul 30, 2021 20:05 +06 (in 0 minutes)

The question for this section

Answer to Transport Layer SQ 2

Your response

As the segment 2 is not received by the receiver it is sending the same acknowledgement three times, this is called fast retransmission. Using this method lost segments are retransmitted when multiple acknowledgement of the same segment is sent by the receiver. The client uses a cache to store the segments sent but not acknowledged and drops them from the cache after getting acknowledgement otherwise retransmits the same segment. In this case exactly this happened. So the segment 2 is retransmitted.

Your Uploaded Files

✓ COMPLETE

2 | Staff Grade

► Your Grade: 5 out of 5



Transport Layer Math

0.0/10.0 points (graded)

A selective-repeat based TCP connection is created between two clients. Client A starts with an ISN of 7644 and client B starts with an ISN of x. Next, client A has a window size of 6666 bytes. Client A sends a HTTP request of 7 object(s) along with the third segment of the three-way-handshake process. This HTTP request consumes 51 bytes of data. On the other hand, each of the object carries a data of size 137 bytes.

(a) The 4th packet is lost on its way while all the other reached client A. What's the acknowledgement number of Client A after receiving the last packet?

 ✗  

(b) What is the window size of client A in the situation mentioned in question (a) above?

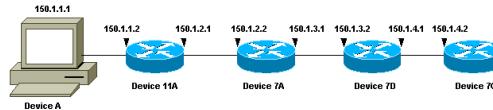
 ✗  

(c) All the lost packets are re-transmitted and if client B had sent the last packet with the sequence number of 34110. What is the ISN of client B?

 ✗  

Submit You have used 1 of 2 attempts

Show Answer



3(a) In the above figure when Device A issues a traceroute to Device 7c, it creates several icmp packets by increasing the TTL value. How does Device A know how to stop send an ICMP packet by increasing the TTL further? [5 marks]

ANSWER TO IPV4 FUNCTION SQ 1

Status

You have completed this assignment. Review your grade and your assessment details.

✓ COMPLETE

▼ 1 | Your Response due Jul 30, 2021 20:05 +06 (in 0 minutes)

The question for this section

IPv4 Function Short Question 1

Your response

Traceroute uses bogus port address that doesn't exist. The device A determines the number of hops by increasing TTL value gradually when it gets the response that the requested IP address is not reached as the TTL ran out. When it reaches device 7c it gets a response that the ip address is reached but the port address is not found as it is a bogus one. So when device A gets the response that the IP is reached, it knows that the requested server is found and stops sending ICMP packets and calculates the hops by last used TTL number.

Your Uploaded Files

✓ COMPLETE

2 | Staff Grade

► Your Grade: 5 out of 5



3 (b) Explain the functions of a router when it receives a datagram through one of its interface/port? [5 marks]

ANSWER TO IPV4 FUNCTION SQ 2

Status

You have completed this assignment. Review your grade and your assessment details.

✓ COMPLETE

▼ 1 | Your Response due Jul 30, 2021 20:05 +06 (in 0 minutes)

The question for this section

IPv4 Function Short Question 2



Your response

A router when it receives a datagram through one of its port, forwards it to the appropriate port. It also has routing tables which is used to map the best route to send data grams. So it will decide which port to forward the datagram to using the table and forward it to that specific port.

Your Uploaded Files

2 | Staff Grade

✓ COMPLETE

► Your Grade: 5 out of 5

### IPv4 Function Math

3.333333333333335/10.0 points (graded)

(a) An original datagram consists of **8362** bytes, which includes **76** bytes of header. This datagram is to be sent from Host A to Host B. There are numerous routers in the network between them. At this moment the datagram has to go from Router R4 to Router R5. The link between R4-R5 only allows maximum frame size of **860**. Assume that the first data byte number is **32**. So then answer the following  
**The following textboxes are for numerical inputs, so please answer with numbers only.**

i) How many fragments will the router R4 have to create to send the data through the link to R5?

11



11

ii) What is the data size of the last fragment?

442



442

(b) Given the routers starting from R1 to R92 are connected in series. R92 is pinging a remote router and succeeds in getting a reply with the TTL value 88. Which router was it pinging if the network system is using a max TTL value of 148?  
Write down the router number only, e.g. 9

60



60

Submit

You have used 1 of 2 attempts

Show Answer

[OPTIONAL] ROUGH [OPTIONAL] WORK [OPTIONAL]

Status

This assignment has closed. One or more deadlines for this assignment have passed. You will receive an incomplete grade for this assignment.

⚠ INCOMPLETE

► 1

Your Response due Jul 30, 2021 20:05 +06 (in 0 minutes)

NOT AVAILABLE

2 | Staff Grade

► Your Grade: Not Started

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