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## MIDTERM EXAMINATION

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### 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

#### 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.



exam as an opportunity to assess your own learnings and to identify the areas that need improving. Good Luck!

## 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.

**NO need to click on "Submit". You agree to the above honor code by attempting the exam.**

Submit

Show Answer

1(a) Why does a multi media server stores multiple copies of the same video encoded at different bit rates? [5 marks]

### ANSWER TO APPLICATION LAYER SQ 1

Status

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

1

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

✓ COMPLETE

2

Staff Grade

✓ COMPLETE

▼ Your Grade: 5 out of 5

The question for this section

Answer to Application Layer SQ 1

Your Response

a multi media video uses different coding techniques in order to give the appropriate video quality to the client. sometimes client data speed reduces for some internet issue, on that time client can not watch the video in high resolution. so due to internet speed up down a multi media server stores multiple copies of the same video encoded at different bit rates so that a client can enjoy the appropriate bit rates according to his/her internet speed.

Your Upload

Assessments of Your Response

▼ Answer to Application Layer SQ 1

5 / 5 POINTS

STAFF GRADE - 5 POINTS

5 Point(s)

1(b) What variables are required to store at both ends of communication (client and server) when cookies are to be used? [5 marks]

### ANSWER TO APPLICATION LAYER SQ 2

Status

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

1

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

✓ COMPLETE

2

Staff Grade

✓ COMPLETE

▼ Your Grade: 5 out of 5

The question for this section

Answer to Application Layer SQ 2

Your Response

first of all, cookie header line of HTTP response message is required. Secondly, Cookie header line in next HTTP request message, thirdly, Cookie file kept on user's host, managed by user's browser. Next, back-end database at Web site. moreover, unique id is required for cookies as well and entry in backend database for ID is also required.

Your Upload



Assessments of Your Response

▼ Answer to Application Layer SQ 2

5 / 5 POINTS

STAFF GRADE - 5 POINTS

5 Point(s)

## Application Layer Math

6.666666666666667/10.0 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 6 DNS server visits for your PC to resolve the IP address. Furthermore, the trace shows that each RTT consumes 66 ms on average.

Finally after getting the IP address, you are able to access the website now maintaining an average RTT of x ms and a non-persistent connection without pipelining. Given, the website contains a total of 20 object(s), each object requiring 307 ms to be transferred.



ANSWER IN millisecond.

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

396

✓ Answer: See Solution

Solution: 396

(b) The total RTT (excluding DNS RTT) to fetch all the objects is 3360 ms. What's the average RTT between you and the web server?

84

✓ Answer: See Solution

Solution: 84 or -69.5

(c) What's the total response time to get all the objects after resolving the IP address? (including the RTTs involved after resolving the IP address)

6620

✗ Answer: See Solution

Solution: 9500 or 3360

Submit

You have used 1 of 2 attempts

Show Answer

Answers are displayed within the problem

2(a) With 'x' number of routers in between two end-devices, on which devices did the segments traverse through the transport layer? Give a brief explanation why. [5 marks]

## ANSWER TO TRANSPORT LAYER SQ 1

Status

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

► 1

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

✓ COMPLETE

2

Staff Grade

✓ COMPLETE

▼ Your Grade: 5 out of 5

The question for this section



## Your Response

since the router is layer 3 device it will not go to the transport layer. the routers will traverse through the routers . so it will traverse through the n number of routers in between two end devices. because its layer 3 device. it will not go to the transport layer.

## Your Upload

## Assessments of Your Response

## ▼ Answer to Transport Layer SQ 1

5 / 5 POINTS

STAFF GRADE - 5 POINTS

5 Point(s) ⓘ

2(b) If a client wishes to start a three way handshake with a server. It sends a segment with seq 201, Ack 0 and flags SYN. How will the server respond and also how will the client reply back to that response of the server? [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)

✓ COMPLETE

2 Staff Grade

## ▼ Your Grade: 4 out of 5

## The question for this section

Answer to Transport Layer SQ 2

## Your Response

if a client wishes to start three way handshake with a server. and it sends a seq 201,ack 0 and flags syn. the server will reply with seq of its ISN number and send ack 202. and then the client will reply with seq 202 and server ISN value with an addition with 1 as a ack. so that's how tcp connection established.

## Your Upload

## Assessments of Your Response

## ▼ Answer to Transport Layer SQ 2

4 / 5 POINTS

STAFF GRADE - 4 POINTS

4 Point(s) ⓘ

STAFF COMMENTS  
flags?

## 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 1000 and client B starts with an ISN of 33229. Next, client A has a window size of 5338 bytes. Client A sends a HTTP request of 8 object(s) along with the third segment of the three-way-handshake process. This HTTP request consumes 99 bytes of data. On the other hand, each of the object carries a data of size 149 bytes.

(a) The 5th packet is lost on its way while all the other reached client A. What is the acknowledgement number of Client A after receiving the last packet?

746

✗ Answer: 33826

746

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

5338

✗ Answer: 4295

5338

(c) All the lost packets are re-transmitted and if client B had sent the last packet with the acknowledgment number of 3637. What is the ISN of client A?

34421

Answer: 3537

34421

Submit

You have used 2 of 2 attempts

Show Answer

Answers are displayed within the problem

3 (a) Write about three different cases where ICMP messages are used to help the processes. [5 marks]

#### ANSWER TO IPV4 FUNCTION SQ 1

##### Status

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

► 1

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

COMPLETE

2

Staff Grade

COMPLETE

Your Grade: 5 out of 5

The question for this section

IPv4 Function Short Question 1

Your Response

error reporting, error testing and data is reached safely or not ICMP handles this. ICMP is used for errors in the underlying communications of network applications , availability of remote hosts , network congestion. these are the three different cases where ICMP messages are used to help the processes.

5 / 5 POINTS

Your Upload

Assessments of Your Response

▼ IPv4 Function Short Question 1

STAFF GRADE - 5 POINTS

5 Point(s)

3 (b) How does TTL help in reducing congestion in the network? [5 marks]

#### ANSWER TO IPV4 FUNCTION SQ 2

##### Status

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

► 1

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

COMPLETE

2

Staff Grade

COMPLETE

Your Grade: 5 out of 5

The question for this section

IPv4 Function Short Question 2

Your Response

when a router receives an IP packet it decrements the TTL by 1 , so TTL 1 is decremented to 0.If the TTL is 0, it will not forward the IP Packet, and send back to the source with an ICMP "time exceeded" message. The sender host's traceroute application will display the following at the first hop using the source IP address of this ICMP Time Exceeded packet.TTL mainly works because it indicates the hops or how many hops its going to live for. if ttl is 3 it can not go more than 3 hops. so basically it suffice how long it can live and it will reduce congestion by going to the only hops that is denoted.

Your Upload

Assessments of Your Response

▼ IPv4 Function Short Question 2

5 / 5 POINTS

STAFF GRADE - 5 POINTS  
5 Point(s) ⓘ

### IPv4 Function Math

0.0/10.0 points (graded)

(a) An original datagram consists of 9301 bytes, which includes 127 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 871 . Assume that the first data byte number is 0 . 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

✖ Answer: 13.0

11

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

464

✖ Answer: 246.0

464

(b) Given the routers starting from R1 to R83 are connected in series. R83 is pinging a remote router and succeeds in getting a reply with the TTL value 186. Which router was it pinging if the network system is using a max TTL value of 225?

Write down the router number only, e.g. 9

82

✖ Answer: 44

82

Submit

You have used 1 of 2 attempts

ⓘ Show Answer

ⓘ Answers are displayed within the problem

#### [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

◀ Previous Next ▶

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