University of Asia Pacific

Department of CSE

Mid-Semester Examination, Spring 2020

Name: Rashik Rahman

Reg ID: 17201012

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"During Examination and upload time I will not take any help from anyone. I will give my exam all by myself."

Answer to the Q. No. 1(a)

Here,

$$R1 = 17201012 \% 49 = 1326 \text{ Mbps}$$

$$R2 = (1326 + 21) = 1347 \text{ Mbps}$$

$$R3 = \frac{1326 + 1347}{2.0} = 1336.5 \text{ Mbps}$$

~~When~~
~~Let calculate~~

Here in this scenario there are three intermediate devices R1, R2 & R3 with 1326 Mbps, 1347 Mbps, 1336.5 Mbps link bandwidth respectively. So the average throughput between and my friend would be 1336.5 Mbps or 1336.5×10^6 bps.

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Answer to the Q. NO. 1(b)

File size = $1996 \times 2 = 3992$ Gb

$= (3992 \times 1024)$ Mb

$= 4087808$ Mb

Let,

Packet size, $L = 100$ Mb

∴ Total no. of packets = $(4087808/100)$

$= 40878.08$

From Q.1(a) we get the average throughput or we can say link rate, $R = 1336.5$ Mbps, and there are three intermediate devices.

So, 1 hop delay = $L/R = \frac{100}{1336.5} = 0.0748$ sec

∴ Total delay = 1 hop delay × No. of total packet + No. of intermediate devices × 1 hop delay [Robust equation self developed]

$= (0.0748 \times 40878.08 + 3 \times 0.0748)$ sec

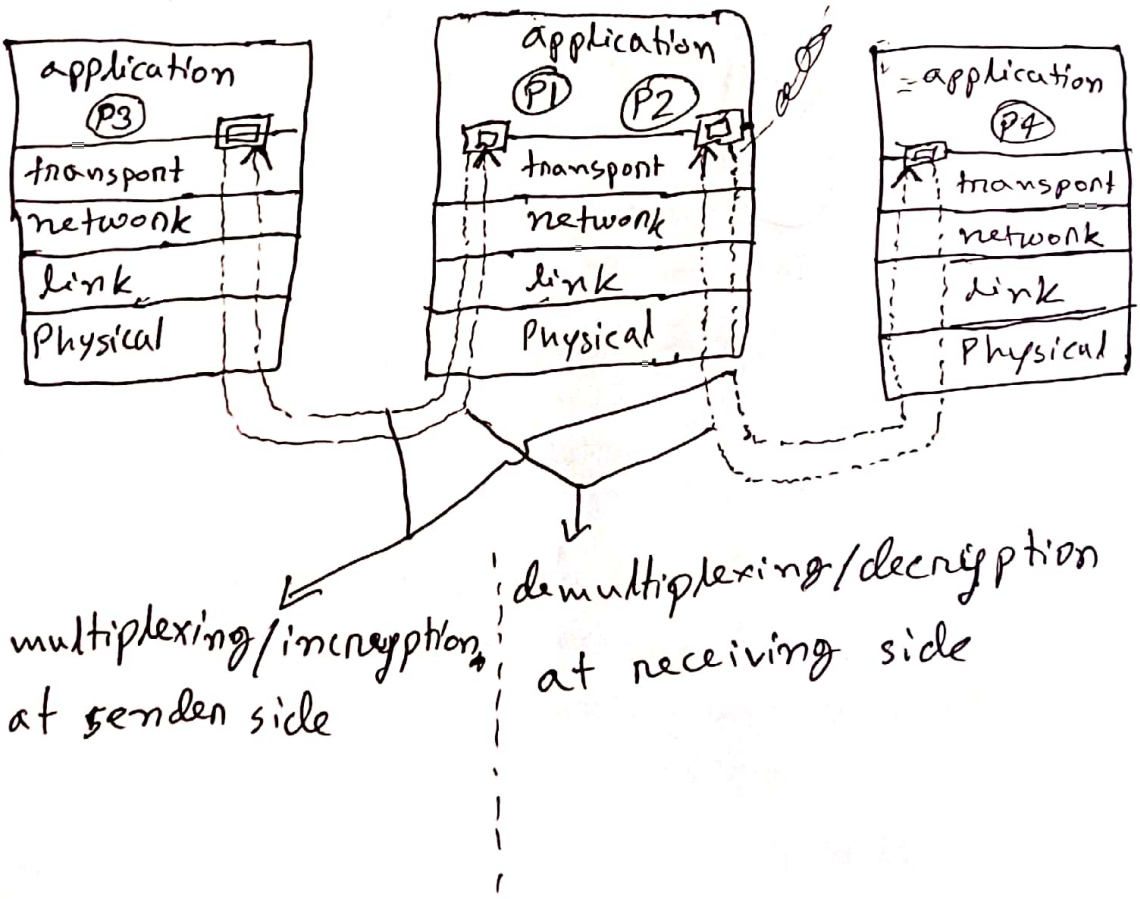
$= 3057.9048$ sec

$= 50.9651$ min

Answer to the Q. NO. 2(a)

From the given scenario, fig and FSM drawn below:

(1) Encryption and decryption



P.T.O

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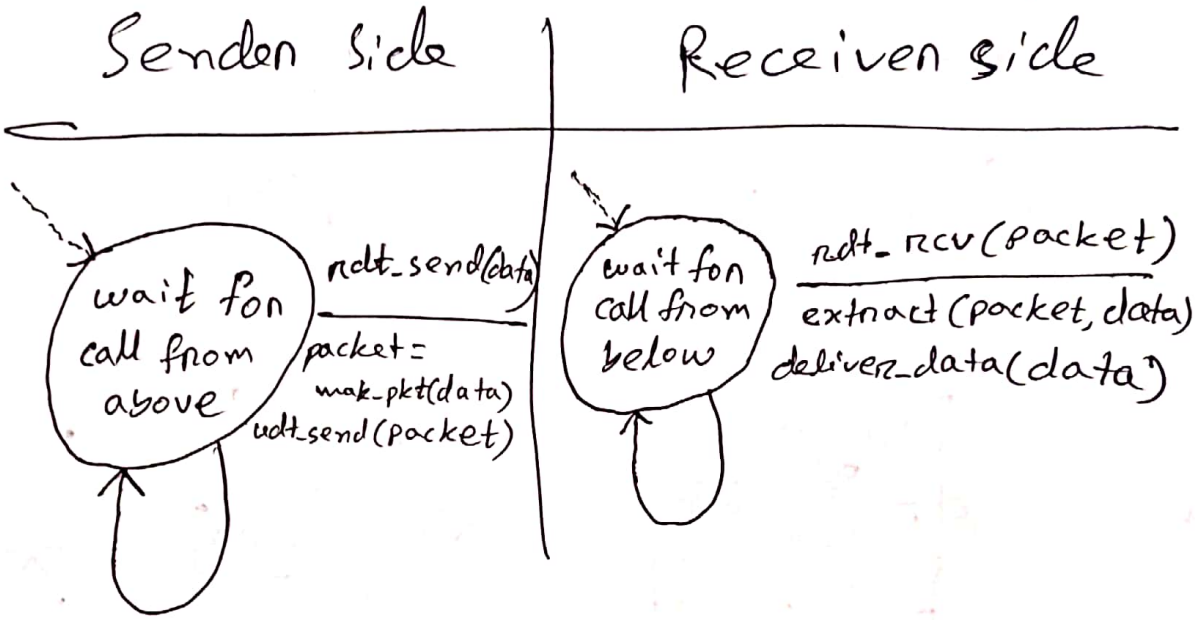
(ii) FSM,

As there's no error and no packet loss so the FSM would be.



Answer to the Q No. 2(b)

Due to lockdown in this situation people are using the internet more. This results in near about maximum utilization of the network link. Network is filled with traffic. So to reduce the traffic on the network on access link I can propose to install a proxy server that'll act as a web cache. This proxy server can cache most of the popular movies and videos available on the internet. Thus the traffic will be reduced from the network link. Proper evidence explained below.

Let,

Average browsing speed is 1.50 Mbps and (data rates) and maximum access link rate is 1.54Mbps. So if we don't use web caching then access link utilization would be $\frac{1.50}{1.54} \times 100 = 97.4\%$. Here we can see that utilization is near about maximum. So to improve browsing speed and experience if we install a proxy server that will cache 50% of the movies and videos on the internet then the

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access link utilization would be $\frac{1.5 \times 0.5}{1.54} \times 100$ = 48.7%, Here we see ~~the~~ a huge improvement just by installing a ~~web ca~~ proxy server for web caching.

As we now ~~the~~ less traffic on the access link will result in more performance. ~~So we To improve the performance further I also ad propose to install~~ So installing proxy server definitely will increase performance.

Answer to the Q. No. 3(a)

Netmask = 16 + 10 = 26

∴ IP address = 14.20.10.41/26

∴ As there's 26 network bit and 6 host bit so the subnetmask will be ~~= 255.5~~

= 255.255.255.192

⊞. Network address calculate,

41 = 0 0 1 0 1 0 0 1

192 = 1 1 0 0 0 0 0 0

AND operation = 0 0 0 0 0 0 0 0

∴ Network address = 14.20.10.0/26

i) Broadcast address = 14.20.10.63

ii) Network Range,

first host = 14.20.10.1

Last host = 14.20.10.62

∴ Range = 14.20.10.1 ~ 14.20.10.62

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Answer to the Q. No. 3(b)

1720 1012
A B

∴ A = 1011

B = 1111

We'll use checksum method to detect bit error in the receiving side.

```
  1011
+ 1111
------
1 0100
    +1
------
  0101
```

∴ checksum = ~~0101~~ 1010

So we send A&B packet with checksum.

Now on the receiver side scenario we add the received packet's bit to get sum,

A+B = 0101 [A&B are unchanged assumed]

now we add the checksum to the sum of packet in receiver that are received.

```
  0101
+ 1010
------
  1111
```

~~Here we~~

Here we get all 1's in the receiving side after adding the checksum to the packet bit & sum on the receiving side. As all the bit is 1 then there's no error. If there were a digit that is not 1 means that is 0 then we would know that bit error occured during transmission.

This is how we can detect bit error in the receiving side.