Date: 29th June, 2020.

COMPUTER NETWORKS
FINAL EXAMINATION - 2020

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- 17k-3730
- Sec C

QUESTION # 01

17k-3730

$L = (0 \bmod 10) + 1 = 1$ Mbits.

$R_1 = 4 + 1 = 5$ Mbps.

$R_2 = 7 + 1 = 8$ Mbps

$R_3 = 4 + 1 = 5$ Mbps

$d_1 = 1 + 1 = 2$ km

$d_2 = 7 + 1 = 8$ km

$d_3 = 3 + 1 = 4$ km

$d_{proc} = 0 + 1 = 1$ MSec.

$d_{queuing\ (pkt1)} = 1 + 1 = 2$ MSec $= TQ_1$

$d_{queuing\ (pkt2)} = 7 + 1 = 8$ MSec $= TQ_2$

$d_{queuing\ (pkt3)} = 3 + 1 = 4$ MSec $= TQ_3$

$d_{queuing\ (pkt4)} = 7 + 1 = 8$ MSec. $= TQ_4$

$S = 2.5 \times 10^8$ m/s.

Transmission delay:

$$T_{A-X} = \frac{L}{R_1} = 0.2 \text{ or } 1/5 \text{ sec}$$

$$T_{X-Y} = \frac{L}{R_2} = 0.125 \text{ or } 1/8 \text{ sec}$$

$$T_{Y-B} = \frac{L}{R_3} = 0.2 \text{ or } 1/5 \text{ sec.}$$

T_D = Transmission Delay(A-B) = 0.2 + 0.2 + 0.125 = 0.525 sec

Propagation delay:

$$T_{prop} = \frac{d}{s} = \frac{d_1 + d_2 + d_3}{s} = \frac{(2+8+4)\times 10^3}{2.5\times 10^8}$$

$$T_{prop} = 5.6 \times 10^{-5} s$$

D_1 = P_{Delay} (pkt 1) (end to end) = $d_{proc} + TQ_1 + T_D + T_{prop}$

$= 1\times10^{-6} + 2\times10^{-6} + 0.525 + 5.6\times10^{-5}$

$= 0.525$ sec.

D_2 = P_{Delay} (Pkt 2) (end to end) = $d_{proc} + TQ_2 + T_D + T_{prop}$

$= 1\times10^{-6} + 8\times10^{-6} + 0.525 + 5.6\times10^{-5}$

$= 0.5250$ sec

D_3 = P_{Delay} (Pkt 3) end to end = $d_{proc} + TQ_2 + TD + T_{prop}$

$= 1\times10^{-6} + 4\times10^{-6} + 0.525 + 5.6\times10^{-5}$

$= 0.525$ sec

D_4 = P_{Delay} (Pkt 4) end to end = $d_{proc} + TQ_3 + T_D + T_{prop}$

$= 1\times10^{-6} + 1.8\times10^{-6} + 0.525 + 5.6\times10^{-5}$

$= 0.525$ sec

Nodal delay = $D_1 + D_2 + D_3 + D_4$

$= 2.1$ sec.

QUESTION #02

(A)

(i) HTTP is used.

(ii) Bachan's client use request message.

(iii) Messages are:

1st Action required (put)
2nd Action required (delete)
3rd Action required (put)

(iv) Put www.bachan.com/image1.jpg.
delete www.bachan.com/image1.jpg.
put www.bachan.com/image2.jpg.

(v) HTTP version 1.1 as put and delete isn't available in HTTP version 1.0.

(B)

1). First, client start communication with sever
- Sever waits to be connected.
- After the connection is established, the program starts running using inter process communication.

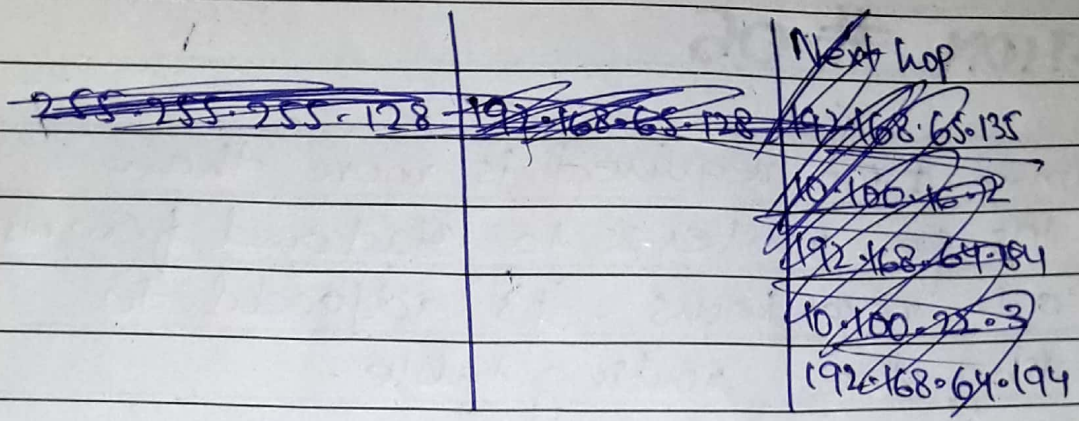
2) It's client sever model.

3) IP address and port no. identification req.

4) Sockets used for communication.

17k-3730 Sec.

Date:



QUESTION #05 (4)

(A)

Subnet mask	Network address	Next hop	Interface
255.255.252.0	10.100.16.0/22	–	m1
255.255.255.128	192.168.65.128/25	–	m0
" " " .0	10.100.22.3 /24	–	m3
" " " .192	192.168.65.194/26	–	m2
–	other	–	m2

(B) It will route to interface "m3"

(C) It will route to interface "m3"

(D) It will route to interface "m2"

17k-3730 Essa.

(5)

Date:

QUESTION #06

(A) Minimum time required is more than 10s, 10s for router 2 to start and few msec for each neighbours. It's adjacent to computing the routing table.

(B) R_1 and R_2, path b/c it's common for all the router traffic, this will utilize even ~~R3 if~~ R_3, R_4, R_7 if we send pkt to R2.

(C) For link R_1 and R2 to stop utilize the other routers, R_1 can cost 7 so that rest of routes will not use this path in ~~this~~ it's own routers, it will take cost of 7 because it will increase cost for all the routers.

QUESTION #07

(A)

N	D(A),P(A)	B	C	D	E	F	G
Z	2,Z	5,Z	4,Z	∞	∞	∞	∞
ZA		4,A	∞	9,A	∞	14,A	∞
ZAB			5,B	8,B	7,B	∞	∞
ZABC				∞	9,C	∞	∞
ZABCE				11,E		∞	18,E
ZABCED						∞	16,D
ZABCEDG							16,G

Z-A least cost is 2

Z-G least cost is 16

&

Dijsktra computed least cost path by considering the only cost edges which has minimum weight -

17k-3730 Date:

~~QUESTION # 02:~~

QUESTION # 09

(A)

There are 3 techniques for it:

a) Parity checking
→ In it, single bit parity detection and ~~2 bit~~ 2D bit parity is also used.

b) Check-sum method
→ used at transport layer and detect error by adding all 16bit nos. & taking the complement.

c) Cyclic redundancy check
→ used at the data link layer and it's more powerful error detection coding.

→ We use these techniques on data-link layer as there is a chance that error is not detected correctly even with checksumming.

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(B)

$G = x^3 + x^2 + 1 = 1101$

G-length = 4 = r+1

r = 3

databits = 1911 19th Nov.

= 0111 0111 0111

```
01110 1000
1101
-----
1010 0100 0
 1101
-----
 0100 0000
  1101
-----
  1010
  1101
-----
  0111
```

Databits = 0111 0111 1 with G = 1101

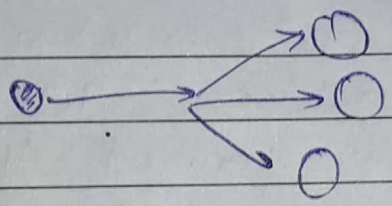
Aw.

17k-3730 SSCK. Date:

QUESTION #10

(A)

(i) When address is not in switch's forwarding table, the frame is treated like broadcast frame and sent to all hosts on network also known as "flooding"



(ii)

VLAN	Mac Address	Port
1	ee:2c:bd:8f:1b:a5	1
1	eb:87:e9:1e:99:a1	2
1	23:4e:19:4b:23:cc	3
1	cb:58:68:2c:4C:04	4

(iii) No, because switch only maintains a table that tells which Mac address of host is reachable via which port so, port doesn't need seperate address.

17k-3730 Sadia. Date:

QUESTION # 10

(B)

Host A

IP : 176.35.196.2

mac : ee:2c:bd:8f:1b:a5

A sends ARP request to B when it knows that B's IP is 176.36.100.2, the MAC addres that it get in return will be routers MAC address 70:c0:d6:cb:c9:e8

As, the route will forward the packets to remote host, knowing the destination IP of host B (176.36.100.2)

A creates link layer frame with R's MAC address as destination, frame contain A to B IP datagram