T. RAHUL
AM·EN·U4·CSE 17,358
CSE -P

1) Orginal datagram - 5000 B
   Data - 4710 B
   20 B - Ip header.

   MTU = 1420 B
   Data = 1400 B ; 20B - Ip header.

   Lex = 1420 | ID = 105 | frag flag = 1 | offset = 0
   Lex = 1420 | ID = 105 | frag flag = 1 | offset = 175
   Lex = 1420 | ID = 105 | frag flag = 1 | offset = 350
   Lex = 740 | ID = 105 | frag flag = 0 | offset = 525

   Total = 5000

2) X = 148·76·38·19
   Y = 153·52·17·80

   3(→x
   2(→y

   Home w/w : 128·119·40·54

   192·163·1·1 — 192·163·1·32
   192·163·1·33 — 192·163·1·64
   192·163·1·65 — 192·163·1·96
   192·163·1·97 — 192·163·1·128

   NAT
   ────
   A+X,
   148·76·38·19 / 5001
        → 192·163·1·32 | 3201

   148·76·38·19 | 5002
        → 192·163·1·64 / 3202

   A+Y,
   153·52·17·80 / 2500
        → 192·163·1·128 / 3201

   153·52·17·80 / 2001
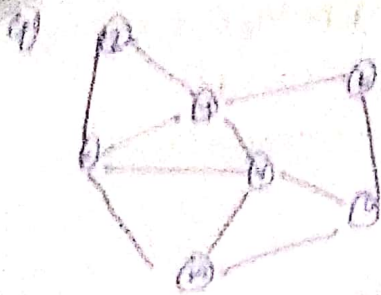   → 192·163·1·128 / 3202.

3) 50 B every 301cc.

   → In TCP segment and then in Ip diagrams

   20 B· (TCP) + 20 B (Datadragrams) + 50B data = 90 B.
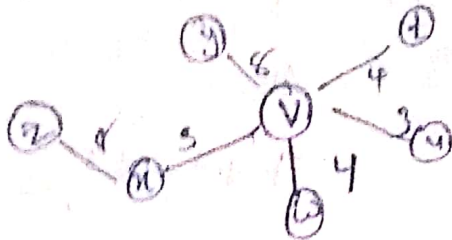
   Overhead = $\frac{40}{90} \times 100 = 44.44\%$.

   Appdata - $\frac{50}{90} = 55.55\%$.

(T·Rahul)

4)

Step	N'						
0	v	8,u	4,N	3,v	4,N	∞	
1	vu	8,u	4,v		4,v		
2	vux	8,v	(1,N)		4,v	4,x	
3	vuxw	8,u	(7,N)			(4,x)	
4	vuxwt	(8,N)					4,n
5	vuxwty						1,n
6	vuxwtyz						1,u

Resulting shortest paths to v,

Forward table

y	(v, u)
x	(v, x)
t	(v, t)
w	(v, w)
y	(v, y)
z	(v, z)

At w≥δ

Step	N'						
0	v	8,v	7,u	(3,N)	4,v	3,v	∞
1	vy	8,v	5,u		4,v	(3,v)	∞
2	vux	8,v	8,v		(4,N)		4,x
3	vuxw	8,v	(5,u)				n,x
4	vuxwt	(8,N)					4,y
5	vuxwty						(4,u)
6	vuxwtyz						

⇒ vuxwtyz = possible

⑤ · Datagram len — 38.30B

          Ip header = 20B
          Data — 3500B

      MTU — 1400B
          1380B → data without
          20B — header.
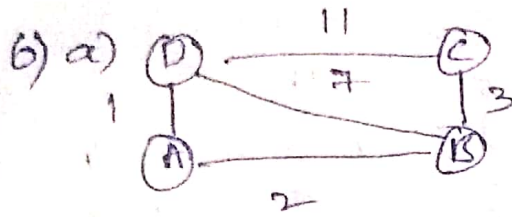
Len = 1896 | id = 2 | frag flag = 1 | offset = 0
Len = 1396 | id = x | frag flag = 1 | offset = 172
Len = 1028 | id = 2 | frag flag = 0 | offset = 304

6) a)

Initial Routing Table

A
Dest	Next hop	Dist
B	B	2
C	—	∞
D	D	1

B)
Dest	Next hop	Dist
A	A	2
C	C	3
D	D	7

c)
Dest	Next hop	Dist
A	∞	—
B	3	B
D	11	D

D)
Dest	Next	Dist
A	A	1
B	B	7
C	C	11

A, C, D → B

A	2	A
C	3	C
D	3	A
B	0	D

B, D, → C

A	5	B
B	3	B
D	10	C
C	0	C

A B C → D

Dest	Dist	hop
A	1	A
B	3	A
C	10	D
D	0	D

B D → C

Dest	Dist	hop
A	0	D
B	2	D
C	5	B
D	1	D

A, C, D → B

best	dist	hop
A	5	B
B	3	B
C	0	C
D	6	D

A, B, C → D

best	dist	hop
A	1	A
B	3	A
C	6	A
D	6	D

reached //

(T. Rahul)

3)a)

	A	B	C	D	E
A	0	7	∞	∞	1
B	7	0	1	8	8
C	6	1	0	2	∞
D	∞	8	2	0	2
E	1	8	∞	2	0

D→E

	A	B	C	D	E
A	0	7	∞	∞	1
B	7	0	1	6	∞
C	∞	1	0	2	8
D	∞	∞	2	0	∞
E	1	8	4	2	0

B→A

	A	B	C	D	E
A	0	7	8	9	1
B	7	0	1	8	8
C	∞	1	0	2	∞
D	∞	8	2	0	2
E	1	8	4	2	0

E→A

	A	B	C	D	E
A	0	7	5	3	1
B	7	0	1	∞	8
C	8	1	0	2	∞
D	∞	∞	2	0	2
E	1	8	4	2	0

C→B

	A	B	C	D	E
A	0	7	5	3	1
B	7	0	1	3	8
C	∞	1	0	2	∞
D	∞	∞	2	0	2
E	1	8	4	2	0

E→D

	A	B	C	D	E
A	0	7	5	1	1
B	7	0	1	3	8
C	∞	1	0	2	∞
D	3	6	2	0	2
E	1	8	4	2	0

C→A

	A	B	C	D	E
A	0	7	5	3	1
B	7	0	1	3	8
C	∞	1	0	2	∞
D	3	3	2	0	2
E	1	8	4	2	0

B→C

	A	B	C	D	E
A	0	7	5	3	1
B	7	0	1	3	8
C	7	0	1	3	8
D	8	1	0	2	4
E	3	3	2	0	2
	1	8	4	2	0

D→E

	A	B	C	D	E
A	0	7	5	3	1
B	7	0	1	3	8
C	∞	1	0	2	4
D	8	1	0	2	4
E	3	3	2	0	2
	1	8	4	2	0

(15)

B best

	A	E	C
A	7	9	6
C	12	12	1
D	10	10	3
E	4	8	5

A best

	B	C
B	7	6
C	8	5
D	10	3
E	12	1

D best

	C	E
A	8	3
B	3	10
C	2	11
E	9	2

E best

	A	B	D
A	1	15	12
B	9	8	5
C	9	9	4
D	11	4	2

T·R·AHUL