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misc 0230   misc 0308
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Question 1:

	AT	CPU BT	I/O BT	CPU BT	I/O BT	CPU BT
A	0	10	2	6 0	0	0
B	0	30	8	7 0	0	0
C	0	20	1	4 0	1	30

Round Robin : time quantum = 5.
Queue A B C A C A B C A B A
Chart

A	B	C	A	C	A	B	C	A	B	A

0   5   8   10   15   19   20   25 28 33 35 36

8 ↕
16

↕ 1 7
11

19 ↑
↓
20

20 ↑
↓
22 (W.T)

	CT	TAT	(W.T)
A	36	36-0=36	36-(11+6)=19
B	35	35-0=35	35-(3+7)=25
C	28	28-0=28	28-(2+4+3)=19

Avg Wait time =
$$\frac{19+25+19}{3} = 3$$

Avg TAT =
$$\frac{36+35+28}{3} = 33$$

	Turnaround Time (TAT)		Wait time (W.T)	
	RR	FCFS	RR	FCFS
A	36	22	19	5
B	35	33	35	23
C	28	36	28	27
Average	33	30.33	3	18.33

	AT	CPU BT	I/O	CPU BT	I/O	CPU
A	0	11	2	6	0	0
B	0	3	8	7	0	0
C	0	2	1	4	1	3

FCFS

Queue : A, B, C | $\frac{A}{22}$ C $\frac{B}{33}$ $\frac{C}{36}$

chart

A	B	C	A	C	B	C

0   11   14   16   22   26   33   36

2↕ → 13

8↕ → 22

1↕ → 17

1↕ → 27
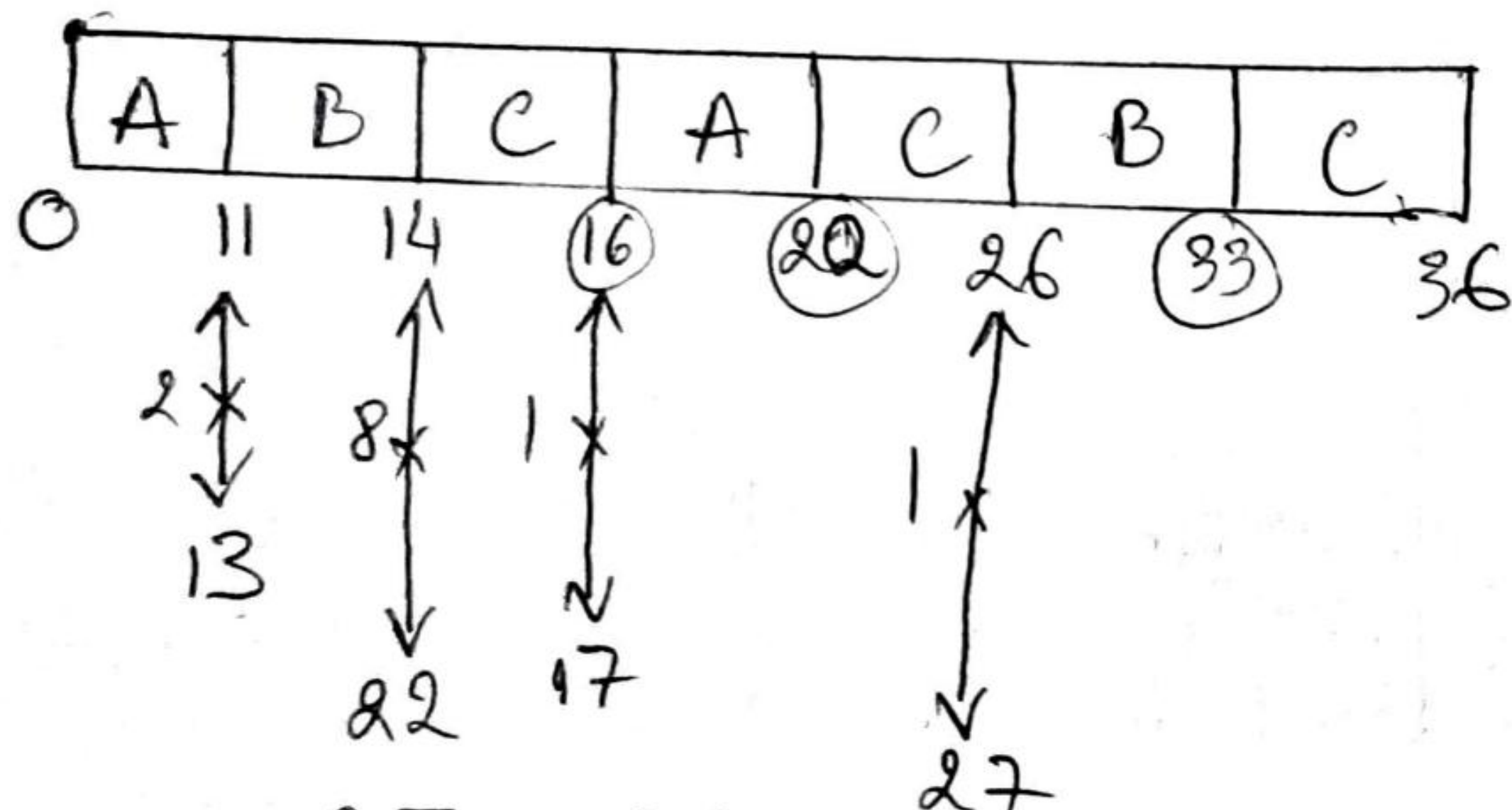
	CT	TAT	W.T
A	22	22-0=22	22-(11+6)=5
B	33	33-0=33	33-(3+7)=23
C	36	36-0=36	36-(2+4+3)=27

Avg TAT = $\frac{22+33+36}{3}$ = 30.33

Avg W.T = $\frac{5+23+22}{3}$ = 18.33

Question 2:

We have $1 GB = 1073741823 \text{ Byte} = 30 \text{ bits}$.

$\Rightarrow$ Virtual Memory = 30 bits.

& physical Memory = 32 bits (System)

+ page size = 4KB

$\Rightarrow$ page offset = $\log_2 4KB = 12$ bits.

Virtual Memory.	Physis memory.
$30 - 12 = 18$ bits	$32 - 12 = 20$ bits

18	12		20	12

a) Virtual address: 0x 00000 A96

00 0000 0000 0000 0000 | 1010 1001 0110

$\underbrace{\qquad}_{18 \text{ bits.}}$ $\underbrace{\qquad}_{12 \text{ bits.}}$

$\Rightarrow$ page # = 0x0 $\Rightarrow$ physical Frame = 0x E

$\Rightarrow$ physical Memory | 0xE | 0xA96 |

$\Rightarrow$ physical Address   0x E0000 A96

b) Virtual address: 0x 00006 813.

00 0000 0000 0000 0110 | 1000 0001 0011

$\underbrace{\qquad}_{18 \text{ bits.}}$ $\underbrace{\qquad}_{12 \text{ bits}}$

page # = 0x 6 $\Rightarrow$ Physical Frame = 0x 725

$\Rightarrow$ Physical memory | 0x725 | 813 |

$\Rightarrow$ Physical Address: 0x 00 725 813.

c) Virtual Address 0x 00004 715

00 0000 0000 0000 0100 | 0111 0001 0101

$\underbrace{\qquad}_{18 \text{ bits}}$ $\underbrace{\qquad}_{12 \text{ bits}}$

page # = 0x4 => physical frame = 0x6

-> physical memory $\boxed{0x6 \mid 715}$

-> phisical address: 0x 00006 715

Question 4

Memory access time = 10ns

ET = (1 − miss rate) * TLB access time.
   + (miss rate * (2 * Memory access time)

 = (1 − 0.01) * (1) + 0.01 * (2 * 10)

 =   0.99   +   0.2

 =   1.19 ns

Question 3:

Yoke = 0.005 / 20 = 0.00025
Rudder pedals = 0.0021 / 15 = 0.00013
Throttle = 0.001 / 10 = 0.0001
Over head = 0.21

$\boxed{\sum_{i=1}^{n} \frac{C_i}{P_i} \leq 1 \\ \text{schedula be} \\ \text{Condition.}}$

Sum = 0.21048 ≤ 1 => The tasks shoul be scheduled

* If They are not able to schedule, increasing CPU speed and
decreasing over head. as much as posible