Sol^n. (A4) $\therefore$ $H_t = 0.2S + 2.5A + 0.3B$.

$\therefore$ A can be power of $2 \Rightarrow A = 1, 2, 4$.

$$S = 2^{10}/AB .$$

CI |A=1|

$B = 2^3 \Rightarrow S = 2^7 \Rightarrow H_t = 30.5 \, ns$.

$B = 2^4 \Rightarrow S = 64 \Rightarrow H_t = 20.7 \, ns$

$B = 2^5 \Rightarrow S = 32 \Rightarrow H_t = \longmapsto 18.5 \, ns$

$B = 2^6 \Rightarrow S = 16 \Rightarrow H_t = 24.9 \, ns$.

CII |A=2|

B	S	H_t .
2^3	64	20.2 ns .
2^4	32	16.2 ns
2^5	16	17.8 ns .
2^6	8	25.8 ns .

CIII |A=4|

B	S	H_t .
2^3	32	18.8 ns
2^4	16	18 ns
2^5	8	21.2 ns
2^6	4 .	30 ns .

So the minima $\rightarrow$ is at A=2, $B = 2^4$, $S = 2^5$

$\parallel$

|16.2 ns|

Graph

$\hookrightarrow$ Most suitable config .
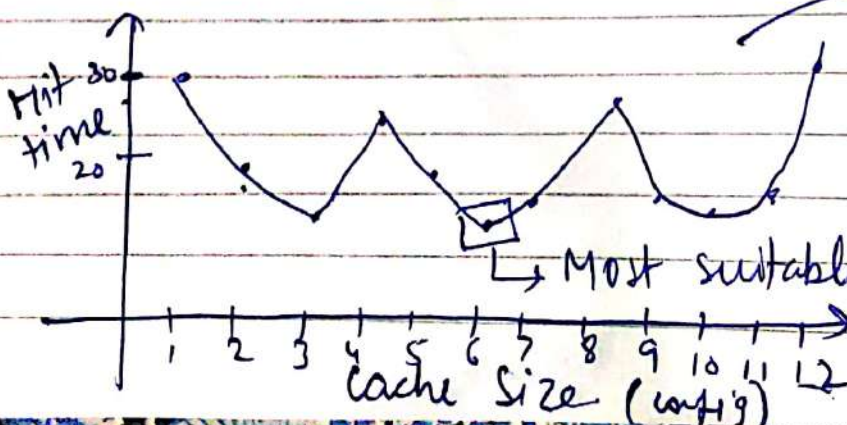
Name : Naman Goyal
Roll No : 180123029

Sol^m (B4) (a) Total size = 2^{16} bytes
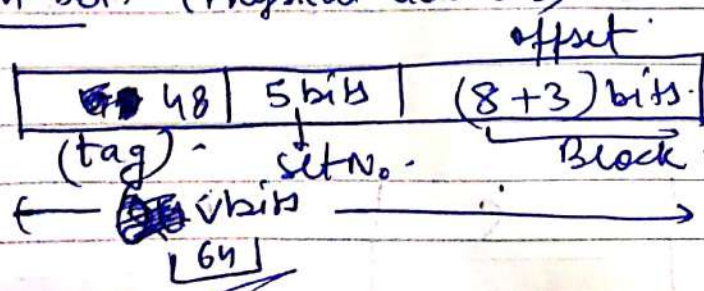Block size = 256 words = 2^8 words
word size = 2^3 bytes.

∴ 1 MB = 2^{20} bytes. ~~So 20 bit physical~~ ~~address.~~

1 Block size = $2^8 \times 2^3 = 2^{11}$.

No. of set are = $\dfrac{2^{16}}{2^{11}}$ = 2^5 # no of sets = $\dfrac{\text{Tot. size}}{\text{Block si}}$

Instruction Set: (Physical address)

offset

48	5 bits	(8+3) bits
(tag)	set No.	Block

← ─── 16 bits ─────────────────→

| 64 |

(b) $\therefore 8192 \,/\, 256 = 0$ and $8192/_{256} = 32$.

B0 | 0 - - 255
B1 | 256 - 511

B15 | - - 4095

B31 |

ISR$_A$ and ISR$_B$ will Occupy 1024 words.

So ISR$_A$ will occupy B0 to B3
and so ISR$_B$ will occupy B8 to B11.

Thus $\Rightarrow$ B16 to B31 will remain empty.

(c) $\therefore$ miss occurs at B0.
Initially starting from B0.
B0 $\rightarrow$ B3 : ISR$_A$
B8 $\rightarrow$ B11 : ISR$_B$. and B0 $\rightarrow$ B15 for
each iteration.

Hence total = $c^* 16 + b(255 \times 16) + a \times 4 +$
execution time $8 \times c +$
                   $9 \times (c \times 16 + b \times 4025 +$
                      $4a + 8c + 1020 \times 2 \times b)$

= $240c + 40a + 58665b$

Ans.