1

$\alpha = 85\%$; $\varepsilon = 25$ ns ; time for m.a. = 70 ns

$$EAT = \frac{\alpha}{100} * 70 + \frac{\varepsilon}{100} * (2*70)$$

$$= \left(\frac{85}{100} * 70\right) + \left(\frac{25}{100} * 140\right)$$

$$= 59.5 + 35 = \boxed{94.5 \text{ ns}}$$

2

memory size → 16 bytes = 2^4 ⇒ $m = 4$

page size → 2 bytes = 2^1 ; $n = 1$

# of pages required → $16/2 = 8 = 2^3$

2^{m-n}

page table:

PN	FN
P_0	6
P_1	2
P_2	5
P_3	1
P_4	3

Main Memory:

0	0 1		
1	2 3	lmn	P_3
2	4 5	def	P_1
3	6 7	opq	P_4
4	8 9		
5	10 11	ijk	P_2
6	12 13	abc	P_0
7	14 15		

Logical Address:

page size → 2 bytes

Address space → m = 4 bytes

*) 13 = 1101 [page 6, offset 1]
= 6 1 at frame 6

physical address = {(6*2)+1} = 13

*) 7 = 0111 [page 3, offset 1]
= 3 1 at frame 2

physical address = {(2*2)+1} = 5

*) 2 = 0010 [page 1, offset 0]
= 1 0 at frame 5

physical address = {(5*2)+0} = 10

*) 9 = 1001 [page 4, offset 1]
= 4 1 at frame 1

physical address = {(1*2)+1} = 3

*) 11 = 1011 [page 5, offset 1]
= 5 1 at frame 3

physical address = {(3*2)+1} = 7