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Ans. no - 1(a)

$x = 08$

sequence = $(x+15)$, $(x+25)$ and $(x+12)$

$= 23, 33, 20$

no of blocks in cache = 16 one-words

① for block mapping:

Block adder	cache block
23	$(23 \bmod 16) = 7$
33	$(33 \bmod 16) = 1$
20	$(20 \bmod 16) = 4$

address of hit contents of cache after memory block of reference accessed miss 0 ..... 1 ... 4 .. 7 are given below:

19/10/06 (2)

address of memory block accessed	Hit or miss	content of cache after reference 0 - - 1 - - 4 - - 7
23	miss	mem[23]
33	miss	mem[33] mem[23]
20	miss	mem[33] mem[20] mem[23]

Ans. 1 (d)

i) given,

cache size = 32 words

main memory = 512 words

block size = 4 words

memory block = $\frac{512}{4}$ = 128 block

cache line = $\frac{32}{4}$ = 8 blocks

Ans. 1 (b)

i) PA = 12 = 2^9

memory bits = 9 bits

tag = 9 - 2 - 2 = 5

cache line = 4 = 2^2, index = 2

block size = 4 = 2^2

offset = 2 bits

memory blocks = 128
= 2^7

ii) PA = 64 = 2^6

memory bits = 6

tag = 6 - 2 - 2 = 2

cache lines = 4 = 2^2

index = 2, offset = 2

memory blocks = 128 = 2^7

19/01/2006 (4)

iii) PA = 128 = 2^7

mem bits = 7 , tag = 7 - 2 - 2 = 3

cache lines = 4 = 2^2

index = 2, offset = 2

memory blocks = 32 = 2^5

iv) PA = 1024 = 2^{10}

mem bits = 10 , tag = 10 - 2 - 3 = 5

cache lines = 8 = 2^3

offset = 2, index = 3

memory blocks = 256 = 2^8

v) PA = 32 = 2^5

mem bits = 5, cache lines = 2^1

∴ tag = 5 - 2 - 1 = 2

index = 1 , offset = 2

memory blocks = 8

= 2^3