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Class Roll No : 00201050 3024
MCA-1st year (2nd Semester)
Subject : COA [CT]
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1. True
2. True
3. False
4. True
5. True
6. True
7. ~~False~~ True

8. Write through
9. Split cache
10. soft
11. 1
12. d.
13. a
14. c
15. c
16. c
17. b
18. c
19. a
20. c
21. a
22. b
23.

23. 4-way set associative $\cancel{\text{@}}$ mapping

$$\therefore k = 4.$$

Block size = 8 words
Size of cache memory = 16 KB
Given, word length = 32 bits

$$\therefore \text{No. of blocks in Cache Memory } (N) = \frac{16 KB}{8 \text{ words}}$$

$$= \frac{\overset{4}{\cancel{16}} \times 1024}{\cancel{28} \times 4} \quad \left[\because 4 \text{ way} \atop \text{set associ.} \right]$$

$$= 512$$

$$\therefore \text{No. of sets} = \frac{\text{no. of blocks in cache memory}}{\text{no. of blocks in set}}$$

$$= \frac{512}{4}$$

$$= 128 \quad = 2^7$$

$$\therefore \cancel{\text{@}} \text{No. of bits in tag field} =$$

$$\log_2 \left(\frac{\text{No. of main mem. blocks}}{\text{no. of sets}} \right)$$

$$= \log_2 \left(\frac{2^{32} / 2^3 \times 2^2}{2^7} \right)$$

$$= \log_2 \left(\frac{2^{27}}{2^7} \right)$$

$$= \cancel{\log_2 2}^{20} = \log_2 2^{20}$$

$$= 20$$

$$\therefore \text{No. of bits in tag field} = 20$$

24.

Two 2's complement numbers are 01001101 and 11101001.

$$
\begin{array}{r}
0\,1\,0\,0\,1\,1\,0\,1 \\
1\,1\,1\,0\,1\,0\,0\,1 \\
\hline
1\;0\,0\,1\,1\,0\,1\,1\,0
\end{array}
$$

carry flag = 1

Overflow flag = 0 since last two carries are same.

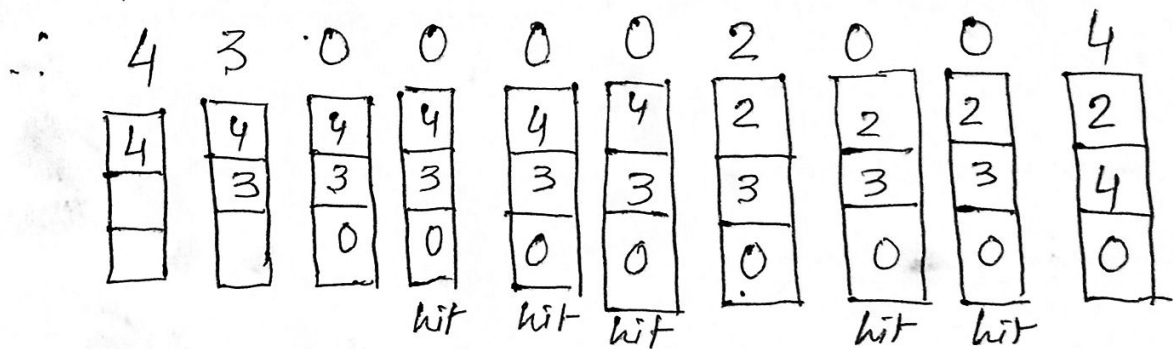sign bit = 0. [since 2's complement addition resulting

carry].

25.

Last 4-digit of class roll number is 3024.

3<u>0</u>00<u>0</u>2<u>00</u>4.

Adding the last digit in 1st position, the number becomes 430002004. [Reference string].

Roll no. is even so LRU replacement method.

3 frames.

∴

4	3	0	0	0	0	2	0	0	4

4	4	4	4	4	4	2	2	2	2
	3	3	3	3	3	3	3	3	4
		0	0	0	0	0	0	0	0
			hit	hit	hit		hit	hit	

∴ No. of page fault = 5