SIDDHARTH CHARAN

19010108 5

P1 → 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25

P2 → 2 3 6 7 10 11 14 15, 18, 19, 22

P3 → 19, 20, 21, 4, 5, 6, 7, 12, 13, 14, 15

P4 → 8, 9, 10, 11, 12, 13, 14, 15, 24, 25

P5 → 16 17 18 19 20 21 22 23 24 25

9 ⇒ we get 10011

Hence, 19th bit is wrong.

H = 1001101111001111001101011

Q.⑤

| | |
|---|---|
| 0 | 0 0 0 0 |
| 1 | 0 0 0 1 |
| 2 | 0 0 1 0 |
| 3 | 0 1 0 0 |
| 4 | 1 0 0 1 |
| 5 | 0 1 1 0 |
| 6 | 1 0 1 1 |
| 7 | 1 1 0 1 |
| 8 | 1 1 1 0 |
| 9 | 1 1 1 1 |

we get these codes by keeping one rule that if code for A is given. If we change all its bit value we will get code for 9-A.

1x1

g=9
c=1

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Q(3) M = 10011010

Hence. As m(bits) = 8

No. of added bits = 4 [$2^K \geq m+K+1$]

Total bits = (K) 8+4 = 12

K1 → 1, 3, 5, 7, 9, 11 :(bit 1)
K2 → 2, 3, 6, 7, 10, 11 (bit 2)
K3 → 4, 5, 6, 7, 12 (bit 4)
K4 → 8, 9, 10, 11, 12 (bit 8)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| K1 | K2 | m1 | K3 | m2 | m3 | m4 | K4 | m5 | m6 | m7 | m8 |
| | | 1 | 0 | 0 | 1 | | 1 | 0 | 1 | 0 | |
| 0 | 1 | | 1 | | | | 0 | | | | |

Hence,

message
⇒ 011100101010 Ans.

To, retrive message, Just remove 1st, 2nd, 4th and 8th bit.

Q(4) Given

H = 1001101111001111000101011

Total 25 bits.

Hence, number of added bits are ⇒ 4.

1st, 2nd, 4th, 8th & 16th are parity bits

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Q. ①

$(BB)_{16} = (11 \times 16^1 + 11 \times 16^0)$

$\Rightarrow (187)_{10}$ — ① [Converting to base 10]

$(273)_x \Rightarrow [2x^2 + 7x^1 + 3]_{10}$ — ②

By eqn ① and ② [converting to base 10]

$2x^2 + 7x + 3 = 187$

$2x^2 + 7x = 184$

$x = -9$ or $x = 8$

↳ invalid

Hence $x = 8$

Q. ②

$(1011\ 0101) + (0111\ 0101) = (1010\ 1010)$

Let, weights are a, b, c and d.

Then

$[(a+c+d)(b+d)] + [b+c+d \quad b+d] = [a+c \quad a+c]$

$a+c+d < 10$

$(b+d) + 10(a+c+d) + 10(b+c+d) + (b+d) = 10a + 10c$

$10a + 13b + 20c + 22d = 11a + 11c$

$13b + 9c + 22d = a$

As, weights are integer, ~~and less than 9~~ & non negative

~~then,~~

~~$b+d < 10$~~

$d + a + c \geq 10$

So, $b = 0$ and $d = 0$

a can be 9 if $c = 1$ & but, this will violate eqn ①

or a can be 0 if $c = 0$

So, $a = 0$ $b = 0$ $c = 0$ $d = 0$ Ans.