



Test 1

L. Number System

Very good!

19
20 *Amul*

- Q.1
1. The decimal equivalent of binary number 1000100 is given as 68 ✓
 2. The binary equivalent of decimal number 43 will be 101011 ✓
 3. The 2's complement of 10001000 will be 1111000 ✓
 4. Subtract 1011 from 110000 and select the correct option 11001 ✓
 5. The decimal equivalent of binary number 111.0010 will be 7.125 ✓

5

Q.2

→ Follow the given steps to convert a given ~~binary~~ decimal number into a binary number using double dabble method :-

Step 1 :- ✓ Divide the number by '2' successively until we get '0' as a quotient as shown below :-

Eg :- $(51)_{10}$ ✓

| | | | Remainders | |
|---|---------------|---|------------|------------------------------|
| | $51/2 = 25$ | — | 1 | ↑ direction to read |
| | $25/2 = 12$ | — | 1 | |
| ✓ | $12/2 = 6$ | — | 0 | |
| | $6/2 = 3$ | — | 0 | |
| | $3/2 = 1$ | — | 1 | |
| | $1/2 = 0$ | — | 1 | |
| | ↑ Quotient | | | |

So the answer is :-

∴ $(51)_{10} = (110011)_2$ ✓

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Q.3

(a) $(1110)_2 - (111)_2$ by 1's
 →

$$\begin{array}{r}
 1110 \quad - \quad 14 \\
 + \quad 000 \quad - \quad \text{1's complement of } 111 \\
 \hline
 \end{array}$$

2

$$\begin{array}{r}
 \boxed{1}110 \\
 + \quad \quad \quad \rightarrow 1 \\
 \hline
 111
 \end{array}$$

→ remove EAC & add
 → 7 required answer

(b) $(1000)_2 - (101010)_2$ by 2's
 →

X

$$\begin{array}{r}
 1000 \rightarrow 8 \\
 + 10110 \rightarrow \text{2's complement of } 101010 \\
 \hline
 \end{array}$$

X

$$\begin{array}{r}
 \boxed{1}1110 \\
 \quad \quad \quad \rightarrow \text{ignore EAC} \\
 \hline
 \end{array}$$

| | |
|------------------------------------|--------|
| 1000 → 8 | 101010 |
| + 10110 → 2's complement of 101010 | ↓ 1's |
| 11110 | 010101 |
| → ignore EAC | ↓ 2's |
| 11110 | 010110 |

1

$$-11110$$

-100010

Q4

① $(23.25)_{10}$

→ $23/2 = 11 - 1$

$11/2 = 5 - 1$

$5/2 = 2 - 1$

$2/2 = 1 - 0$

$1/2 = 0 - 1$

$0.25 \times 2 = 0.5 - 0$

$0.5 \times 2 = 1 - 1$

①

$\therefore (23.25)_{10} = (10111.01)_2$

② $(10.5)_{10}$

→ $10/2 = 5 - 0$

$5/2 = 2 - 1$

$2/2 = 1 - 0$

$1/2 = 0 - 1$

$0.5 \times 2 = 1 - 1$

①

$\therefore (10.5)_{10} = (1010.1)_2$

③ $(87.0625)_{10}$

$$\begin{array}{r}
 87/2 = 43 - 1 \\
 43/2 = 21 - 1 \\
 21/2 = 10 - 1 \\
 10/2 = 5 - 0 \\
 5/2 = 2 - 1 \\
 2/2 = 1 - 0 \\
 1/2 = 0 - 1
 \end{array}$$

$$\begin{array}{r}
 0.0625 \times 2 = 0.125 - 0 \\
 0.125 \times 2 = 0.25 - 0 \\
 0.25 \times 2 = 0.5 - 0 \\
 0.5 \times 2 = 1 - 1
 \end{array}$$

①

$\therefore (87.0625)_{10} = (1010111.0001)_2$

④ $(25.125)_{10}$

$$\begin{array}{r}
 25/2 = 12 - 1 \\
 12/2 = 6 - 0 \\
 6/2 = 3 - 0 \\
 3/2 = 1 - 1 \\
 1/2 = 0 - 1
 \end{array}$$

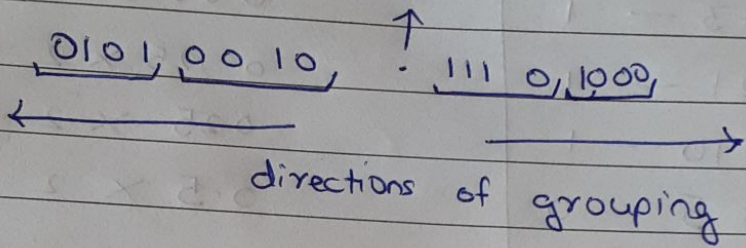
$$\begin{array}{r}
 0.125 \times 2 = 0.25 - 0 \\
 0.25 \times 2 = 0.5 - 0 \\
 0.50 \times 2 = 1 - 1
 \end{array}$$

①

$\therefore (25.125)_{10} = (11001.001)_2$

Q.5

$(1010010.11101)_2$ binary point

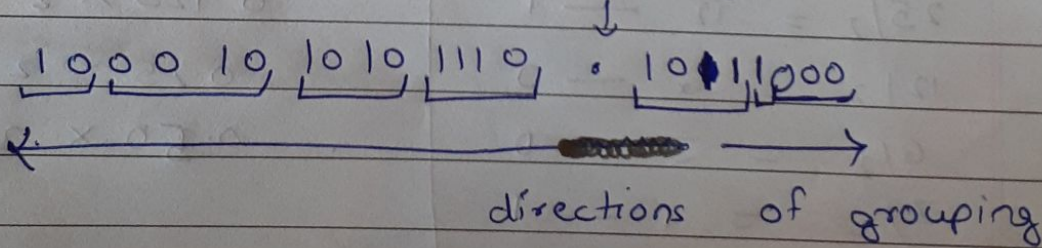


2

$\underbrace{0101}_{5} \underbrace{0010}_{2} . \underbrace{1110}_{E} \underbrace{1000}_{1}$ ✓

$\therefore (1010010.11101)_2 = (52.E1)_{16}$

$(10001010101110.10111)_2$ binary point



2

$\underbrace{0010}_{2} \underbrace{0010}_{2} \underbrace{1010}_{A} \underbrace{1110}_{E} . \underbrace{1011}_{B} \underbrace{1000}_{8}$

$\therefore (10001010101110.10111)_2 = (22AE.B8)_{16}$