26/03/2021

Test 1 — L. Number System

19/20

Very good!

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 10111 from 110000 and select the correct option 11001 ✓

5. The decimal equivalente 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 :- $(51)_{10}$

$51/2$	= 25	—— 1	Remainders ↑ 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 :-

$\therefore (51)_{10} = (110011)_2$.

3

Q.3

(a) $(1110)_2 - (111)_2$ by 1's

→

1110 — 14

\+ 000 — 1's complement of 111

2

[1]110

\+ [1] → remove EAC & add

111 → [7] required answer

(b) $(1000)_2 - (101010)_2$ by 2's

→

1000 → 8

X + 10110 → 2's complement of 101010

[1]1110

→ ignore EAC

X

-1110

1

101010 ↓ 1's → 010101 ↓ 2's → 010110

-100010

Q4

① $(23.25)_{10}$

$23/2 = 11 - 1$

$11/2 = 5 - 1$

$5/2 = 2 - 1$

$2/2 = 1 - 0$

$1/2 = 0 - 1$

(1)

$0.25 \times 2 = 0.5 - 0$

$0.5 \times 2 = 1 - 1$

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

② $(10.5)_{10}$

$10/2 = 5 - 0$

$5/2 = 2 - 1$

$2/2 = 1 - 0$

$1/2 = 0 - 1$

(1)

$0.5 \times 2 = 1 - 1$

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

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③ $(87.0625)_{10}$

$87/2$	$= 43$	$- 1$
$43/2$	$= 21$	$- 1$
$21/2$	$= 10$	$- 1$
$10/2$	$= 5$	$- 0$
$5/2$	$= 2$	$- 1$
$2/2$	$= 1$	$- 0$
$1/2$	$= 0$	$- 1$

0.0625×2	$= 0.125$	$- 0$
0.125×2	$= 0.25$	$- 0$
0.25×2	$= 0.5$	$- 0$
0.5×2	$= 1$	$- 1$

1

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

④ $(25.125)_{10}$

$25/2$	$= 12$	$- 1$
$12/2$	$= 6$	$- 0$
$6/2$	$= 3$	$- 0$
$3/2$	$= 1$	$- 1$
$1/2$	$= 0$	$- 1$

0.125×2	$= 0.25$	$- 0$
0.25×2	$= 0.5$	$- 0$
0.5×2	$= 1$	$- 1$

1

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

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Q.5

→ $(10100\,10 \cdot 111\,01)_2$

binary point

0101 0010 · 1110 1000

directions of grouping

(2) 0101 0010 · 1110 1000 ✓

5 2 . E 8

$\therefore (10100\,10 \cdot 111\,01)_2 = (52 \cdot E8)_{16}$

$(1000\,1010\,1010\,1110 \cdot 10111)_2$ binary point

1000 1010 1010 1110 · 1011 1000

directions of grouping

0010 0010 1010 1110 · 1011 1000

(2) 2 2 A E · B 8 ✓

$\therefore (1000\,1010\,1010\,1110 \cdot 10111)_2 = (22AE \cdot B8)_{16}$