

Binary to Decimal Conversion Questions

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Binary to Decimal Conversion MCQ Question 1

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What is $(1111)_2 + (1001)_2 - (1010)_2$ equal to?

1. $(111)_2$
2. $(1100)_2$
3. $(1110)_2$
4. $(1010)_2$
5. None of these



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Answer (Detailed Solution Below)

Option 3 : $(1110)_2$

Binary to Decimal Conversion MCQ Question 1 Detailed Solution

Concept:

Covert Binary to Decimal:

For binary number with n digits;

$D_{n-1} \dots D_3 D_2 D_1 D_0$

The decimal number is equal to the sum of binary digits (D_n) times their power of 2 (2^n)

Decimal = $D_0 \times 2^0 + D_1 \times 2^1 + D_2 \times 2^2 + \dots$

Decimal to binary:

- Take decimal number as dividend.
- Divide the number by 2.
- Get the integer quotient for the next iteration.
- Get the remainder (it will be either 0 or 1 because of divisor 2).
- Repeat the steps until the quotient is equal to 0
- Write the remainders in reverse order (which will be equivalent binary number of given decimal number).

Calculation:

To find: $(1111)_2 + (1001)_2 - (1010)_2 = ?$

$$(1111)_2 = 1 \times 2^0 + 1 \times 2^1 + 1 \times 2^2 + 1 \times 2^3 = 15$$

$$(1001)_2 = 1 \times 2^0 + 0 \times 2^1 + 0 \times 2^2 + 1 \times 2^3 = 9$$

$$(1010)_2 = 0 \times 2^0 + 1 \times 2^1 + 0 \times 2^2 + 1 \times 2^3 = 10$$

$$(1111)_2 + (1001)_2 - (1010)_2 = 15 + 9 - 10 = 14$$

Now, in binary 14 can be written as,

Division	Remainder (R)
$14 / 2 = 7$	0
$7 / 2 = 3$	1
$3 / 2 = 1$	1
$1 / 2 = 0$	1

$$(14)_{10} = (1110)_2$$

Hence, option (3) is correct.

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Binary to Decimal Conversion MCQ Question 2

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The decimal equivalent of 11100 is ____

1. 23

2. 31

3. 27

4. 28

Answer (Detailed Solution Below)

Option 4 : 28

Binary to Decimal Conversion MCQ Question 2 Detailed Solution

Concept:

Binary to Decimal conversion:

For Example, to convert 10011011 into decimal the following process must be followed.

1 0 0 1 1 0 1 1

$$\begin{aligned}1 \times 2^0 &= 1 \\1 \times 2^1 &= 2 \\0 \times 2^2 &= 0 \\1 \times 2^3 &= 8 \\1 \times 2^4 &= 16 \\0 \times 2^5 &= 0 \\0 \times 2^6 &= 0 \\1 \times 2^7 &= 128\end{aligned}$$

Result = 155

Calculation:

- Here, we have to find the decimal equivalent of the binary number $(11100)_2$
- $11100 = 2^0 \times 0 + 2^1 \times 0 + 2^2 \times 1 + 2^3 \times 1 + 2^4 \times 1 = 0 + 0 + 4 + 8 + 16 = 28$
- So, the **decimal equivalent of 11100 is 28**
- i.e $(11100)_2 = (28)_{10}$

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Binary to Decimal Conversion MCQ Question 3

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What will be the decimal equivalent for binary number 1011?

1. 8

2. 9

3. 11

4. 15

Answer (Detailed Solution Below)

Option 3 : 11



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Binary to Decimal Conversion MCQ Question 3 Detailed Solution

The Correct Answer is **11**.

Key Points

- A number with **base 2** is known as a **Binary Number**, and numbers with **base 10** are known as **Decimal Numbers in the Number System**.
- The decimal numbers are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, and so on.
- Binary numbers, on the other hand, are used in digital systems and are represented by just two digits – 0 and 1.
- **Binary to Decimal Conversion:**

$$(1011)_2 = (?)_{10}$$

$$= 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 1 \times 2^0$$

$$= 8 + 0 + 2 + 1$$

$$= (11)_{10}$$

Hence, The Decimal conversion of 1011 is 11.

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Binary to Decimal Conversion MCQ Question 4

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Value of $(34.36)_{10}$ in binary is:

1. $(10010.0101)_2$

2. $(10010.10111)_2$



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3. $(1010.10111)_2$

4. $(100010.010111)_2$

Answer (Detailed Solution Below)

Option 4 : $(100010.010111)_2$

Binary to Decimal Conversion MCQ Question 4 Detailed Solution

Steps to covert from Decimal to Binary

- Divide the number by 2.
- Get the integer quotient for the next iteration.
- Get the remainder for the binary digit.
- Repeat the steps until the quotient is equal to 0.

Division by 2	Quotient	Remainder
34/2	17	0
17/2	8	1
8/2	4	0
4/2	2	0
2/2	1	0
2/1	0	1

$34 = 100010$

0.36

$0.36 \times 2 = 0.72$ (0)

$0.72 \times 2 = 1.44$ (1)

$0.44 \times 2 = 0.88$ (0)

$0.88 \times 2 = 1.76$ (1)

$0.76 \times 2 = 1.52$ (1)

$0.52 \times 2 = 1.04$ (1)

$0.36 = (010111)_2$

Therefore, $(34.36)_{10} = (100010.010111)_2$

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Binary to Decimal Conversion MCQ Question 5

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What would be the equivalent binary expression for 456?

1. 456

2. 111001000

3. 111

4. 00111



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Answer (Detailed Solution Below)

Option 2 : 111001000

Binary to Decimal Conversion MCQ Question 5 Detailed Solution

Concept:

Decimal to binary:

- Take the decimal number as a dividend.
- Divide the number by 2.
- Get the integer quotient for the next iteration.
- Get the remainder (it will be either 0 or 1 because of divisor 2).
- Repeat the steps until the quotient is equal to 0
- Write the remainders in reverse order (which will be the equivalent binary number of a given decimal number)

Calculation:

Binary of 456:

Division	Remainder (R)
$456 / 2 = 228$	0
$228 / 2 = 114$	0
$114 / 2 = 57$	0
$57 / 2 = 28$	1
$28 / 2 = 14$	0
$14 / 2 = 7$	0
$7 / 2 = 3$	1
$3 / 2 = 1$	1
1	


Hence the equivalent binary expression for 456 will be **111001000**.


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Binary to Decimal Conversion MCQ Question 6

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Consider the equation $(43)_x = (y3)_8$ where x and y are unknown. The number of possible solution is

1. 4

2. 5

3. 6

4. 7

Answer (Detailed Solution Below)

Option 2 : 5



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Binary to Decimal Conversion MCQ Question 6 Detailed Solution

The correct answer is **5**.

Key Points

$$(43)_x = (y3)_8$$

Since a number with base k can only have digits from 0 to $(k-1)$, we can conclude

$$x > 5$$

$$y < 7$$

Now, the original equation, when converted to decimal base gives:

$$4x^1 + 3x^0 = y(8^1) + 3(8^0)$$

$$4x + 3 = 8y + 3$$

$$X = 2y$$

So, we have the following constraints :

$$x \geq 5, y \leq 7, x = 2y$$

where x, y are integers

The set of values of (x, y) that satisfy these constraints are:

$$x=6, y=3$$

$$x=8, y=4$$

$$x=10, y=5$$

$$x=12, y=6$$

$$x=14, y=7$$

So total solutions are 5.

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Binary to Decimal Conversion MCQ Question 7

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Decimal fraction 0.375 in binary form is

1. 0.0011

2. 0.011

3. 0.0111

4. 0.111



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Answer (Detailed Solution Below)

Option 2 : 0.011

Binary to Decimal Conversion MCQ Question 7 Detailed Solution

Concept:

Decimal to binary:

- Take the decimal number as a dividend.
- Divide the number by 2.
- Get the integer quotient for the next iteration.
- Get the remainder (it will be either 0 or 1 because of divisor 2).
- Repeat the steps until the quotient is equal to 0
- Write the remainders in reverse order (which will be the equivalent binary number of a given decimal number).

Decimal to binary: (fractional part)

- Take the decimal numbers as the multiplicand.
- Multiply this number by 2 (2 is the base of binary so multiplier here).
- Store the value of the integer part of the result in an array (it will be either 0 or 1 because of multiplier 2).
- Repeat the above two steps until the number became zero.
- Write these resultant integer part

Calculation:

Convert decimal fractional number 0.375 into binary number.

Here, decimal fraction: 0.375

Multiplication	Resultant integer part (R)
$0.375 \times 2 = 0.750$	0
$0.750 \times 2 = 1.50$	1
$0.50 \times 2 = 1.00$	1
$0.00 \times 2 = 0$	0

Now, write these resultant integer parts, this will be 0.0110 which is the equivalent binary fractional number of decimal fractional 0.375.

\therefore 57.375 can be written as 111001.011 in binary

Hence, option (2) is correct.

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Binary to Decimal Conversion MCQ Question 8

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What is the decimal value for the binary number 1001.0010?

1. 125
2. 12.5
3. 90.125
4. 9.125

Answer (Detailed Solution Below)

Option 4 : 9.125

Binary to Decimal Conversion MCQ Question 8 Detailed Solution

Concept :

The binary number system with only two independent digits, 0 and 1, is a base-2 number system. All larger binary numbers are represented in terms of '0' and '1'.

The decimal number is equal to the sum of binary digits (D_n) times their power of 2 (2^n)

$$\text{Decimal} = \dots + D_2 \times 2^2 + D_1 \times 2^1 + D_0 \times 2^0$$

In order to convert the binary fractions to decimal numbers, we use negative power of 2 to the right of the binary point.

$$= D_{-1} 2^{-1} + D_{-2} 2^{-2} + \dots$$

Calculation:

Given binary number is: 1001.0010

The decimal equivalent of the integer part will be:

$$\begin{aligned} (\text{Decimal})_{\text{Integer}} &= (1) \times 2^3 + (0) \times 2^2 + (0) \times 2^1 + (1) \times 2^0 \\ &= 8 + 1 = 9 \end{aligned}$$

The fractional part will be:

$$\begin{aligned} (\text{Decimal})_{\text{Fractional}} &= (0) \times 2^{-1} + (0) \times 2^{-2} + (1) \times 2^{-3} + (0) \times 2^{-4} \\ &= 2^{-3} = 0.125 \end{aligned}$$

∴ The resultant decimal equivalent is:

$$(1001.0010)_2 = (9.125)_{10}$$

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Binary to Decimal Conversion MCQ Question 9

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Consider the equation $(40)_x = (132)_y$ in some bases x and y . Then a possible set of values of x and y are

1. 8 and 12

2. 12 and 8

3. 6 and 12

4. 12 and 6



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Answer (Detailed Solution Below)

Option 1 : 8 and 12

Binary to Decimal Conversion MCQ Question 9 Detailed Solution

Concept:

$$(ABCD)_a = D \cdot a^0 + C \cdot a^1 + B \cdot a^2 + A \cdot a^3$$

Calculation:

$$(40)_x = (132)_y$$

$$\Rightarrow 0 \times x^0 + 4 \times x^1 = 2 \times y^0 + 3 \times y^1 + 1 \times y^2$$

$$\Rightarrow 4x = 2 + 3y + y^2$$

$$\Rightarrow 4x - 2 = 3y + y^2$$

All options are wrong

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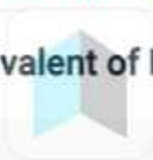
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Binary to Decimal Conversion MCQ Question 10

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Decimal equivalent of Binary No. 100 is:



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1. 100

2. 1

3. 4

4. 16

Answer (Detailed Solution Below)

Option 3 : 4

Binary to Decimal Conversion MCQ Question 10 Detailed Solution

The Correct Answer is **Option 3** i.e **4**.

Binary number	1	0	0
Power of 2	2^2	2^1	2^0

$$100_2 = 2^0 \times 0 + 2^1 \times 0 + 2^2 \times 1 = 4_{10}$$