

Name

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Roll no

20P-0153

Section

BSCS # 2B2

DLD

Assignment - 1

Submitted to

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Q#5

11011011011000101100111010110111

Solution:-

$$\begin{array}{cccccccccccc} + 2^{15} & + 2^{14} & + 2^{11} & + 2^{10} & + 2^9 & + 2^7 & + 2^5 & + 2^4 & + 2^2 & + 2^1 & + 2^0 \\ 2^{31} & + 2^{30} & + 2^{28} & + 2^{27} & + 2^{25} & + 2^{24} & + 2^{22} & + 2^{21} & + 2^{17} \end{array}$$

$$\begin{aligned} & 2048 + 1024 + 512 + 128 + 32 + 16 + 4 + 2 + 1 \\ & + 2097152 + 131072 + 32768 + 16384 + \\ & + 134217728 + 33554432 + 16777216 + 4194304 \\ & = 2147483648 + 1073741824 + 268435456 \end{aligned}$$

$$3680685751$$

$$3680685751$$

Q#01:

20P-0153



Decimal	Signed Magnitude	1's complement	2's complement
7	0111	0000	0001
6	0110	0001	0010
5	0101	0010	0011
4	0100	0011	0100
3	0011	0100	0101
2	0010	0101	0110
1	0001	0110	0111
0	0000	0000	0000
-0	1000	1111	NA
-1	1001	1110	1111
-2	1010	1101	1110
-3	1011	1100	1101
-4	1100	1011	1100
-5	1101	1010	1011
-6	1110	1001	1010
-7	1111	1000	1001
-8	NA	NA	1000



Q#4.

202-0153

-412.390625

~~10~~

for (412)

for floating point

$$\begin{array}{r|l}
 2 & 412 \\
 \hline
 2 & 206-0 \\
 2 & 103-0 \\
 2 & 51-1 \\
 2 & 25-1 \\
 2 & 12-1 \\
 2 & 6-0 \\
 2 & 3-0 \\
 & 1-1
 \end{array}$$

$$0.390625 \times 2 \rightarrow 0$$

$$0.78125 \times 2 = 1$$

$$0.5625 \times 2 = 1$$

$$0.125 \times 2 = 0$$

$$0.25 \times 2 = 0$$

$$0.5 \times 2 = 1$$

$$(0.011001)$$

$$(110011100)$$

$$(110011100)$$

$$(0.011001)$$

$$412.390625:$$

↓

$$(110011100.011001)_2$$

$$110011100011001 \times 2^{-6}$$

$$110011100011001 \times 2^{14} \times 2^{-6}$$

$$110011100011001 \times 2^8$$

$$\text{Sign} = 1$$

$$\text{Exponent} = 8$$

$$= 8 + 2^{8-1} - 1$$

$$= 8 + 128 - 1$$

$$= (135)_{10}$$



$$\begin{array}{r|l}
 2 & 135 \\
 \hline
 2 & 67-1 \\
 \hline
 2 & 33-1 \\
 \hline
 2 & 16-1 \\
 \hline
 2 & 8-0 \\
 \hline
 2 & 4-0 \\
 \hline
 2 & 2-0 \\
 \hline
 & 1-0
 \end{array}$$

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$$(135)_{10} = (10000111)_2$$

Sign : Exponent : Mantissa

1 bit : 8-bits : 23-bits

1 : 10000111 : 100111000110010000000000

So the answer is:

1 10000111 100111000110010000000000



Q#2.

20R0153

110111101.1011



Solution

110111101.1011

$$2^8 + 2^7 + 2^5 + 2^4 + 2^3 + 2^2 + 2^0 + 2^{-1} + 2^{-3} + 2^{-4} \\ = 256 + 128 + 32 + 16 + 8 + 4 + 1 + 0.5 + 0.125 + 0.0625 \\ 445.6875$$



Q#3(a)

86235.876

86235.876

256, 128, 64, 32, 16, 8, 4, 2, 1

16384, 8192, 4096, 2048, 1024, 512

65536, 32768

$$= 86235$$

$$= 65536 + 20699$$

$$65536 + 16384 + 4315$$

$$65536 + 16384 + 4096 + 219$$

$$65536 + 16384 + 4096 + 128 + 91$$

$$65536 + 16384 + 4096 + 128 + 64 + 27$$

$$65536 + 16384 + 4096 + 128 + 64 + 16 + 8 + 2 + 1$$

$$(10101000011011011)_2$$

fraction part.

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$$0.876$$

$$0.5 + 0.376$$

$$0.5 + 0.25 + 0.126$$

$$0.5 + 0.25 + 0.125 + 0.001$$

(101010000110110.111000)

It repeats and becomes.

(101010000110110.11100000010000011),

Extra steps are shown on  
rough papers.



for fractional part

202-0.53



$$0.876 \times 2 - 1$$

$$0.752 \times 2 - 1$$

$$0.504 \times 2 - 1$$

$$0.008 \times 2 - 0$$

$$0.016 \times 2 - 0$$

$$0.032 \times 2 - 0$$

$$0.064 \times 2 - 0$$

$$0.128 \times 2 - 0$$

$$0.256 \times 2 - 0$$

$$0.512 \times 2 - 1$$

$$0.024 \times 2 - 0$$

$$0.048 \times 2 - 0$$

$$0.096 \times 2 - 0$$

$$0.192 \times 2 - 0$$

$$0.0384 \times 2 - 0$$

$$0.768 \times 2 - 1$$

$$0.536 \times 2 - 1$$

It will repeat again &

again so we stop here

$(10101000011011011.11100000010000011)_2$

Answer

Q#3 (b)

$$\begin{array}{r} 2 \overline{) 86235} \end{array}$$

$$\begin{array}{r} 2 \overline{) 43117-1} \end{array}$$

$$\begin{array}{r} 2 \overline{) 21558-1} \end{array}$$

$$\begin{array}{r} 2 \overline{) 10779-0} \end{array}$$

$$\begin{array}{r} 2 \overline{) 5389-1} \end{array}$$

$$\begin{array}{r} 2 \overline{) 2696-1} \end{array}$$

$$\begin{array}{r} 2 \overline{) 1349-0} \end{array}$$

$$\begin{array}{r} 2 \overline{) 673-1} \end{array}$$

$$\begin{array}{r} 2 \overline{) 336-1} \end{array}$$

$$\begin{array}{r} 2 \overline{) 168-0} \end{array}$$

$$\begin{array}{r} 2 \overline{) 84-0} \end{array}$$

$$\begin{array}{r} 2 \overline{) 42-0} \end{array}$$

$$\begin{array}{r} 2 \overline{) 21-0} \end{array}$$

$$\begin{array}{r} 2 \overline{) 10-1} \end{array}$$

$$\begin{array}{r} 2 \overline{) 5-0} \end{array}$$

$$\begin{array}{r} 2 \overline{) 2-1} \end{array}$$

$$1-0$$

2012-0153



(10101000011011011)



for fractional part

$$0.876 \times 2 = 1$$

$$0.752 \times 2 = 1$$

$$0.504 \times 2 = 1$$

$$0.008 \times 2 = 0$$

$$0.016 \times 2 = 0$$

$$0.032 \times 2 = 0$$

$$0.064 \times 2 = 0$$

$$0.128 \times 2 = 0$$

$$0.256 \times 2 = 0$$

$$0.512 \times 2 = 1$$

$$0.024 \times 2 = 0$$

$$0.048 \times 2 = 0$$

$$0.096 \times 2 = 0$$

$$0.192 \times 2 = 0$$

$$0.0384 \times 2 = 0$$

$$0.768 \times 2 = 1$$

$$0.536 \times 2 = 1$$

2022-01-53



It will repeat again &

again so we stop here

$(10101000011011011.11100000010000011)_2$

Answer

 end.