

21-Sep

DELD Test

2/1/8

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1) Binary equivalent of $(45.312)_8$ is $(X.Y.Z)_2$

$(45.312)_8 \rightarrow \text{octal}$

$(100\ 101.\ 011\ 001\ 010)_2 \rightarrow \text{Binary}$

ie. $(100101.01100101)_2$

Ans

2) decimal value of $(A0F9.0EB)_{16}$ is $(X.Y)$

$(A0F9.0EB)_{16}$

$(10 \times 16^3 + 0 \times 16^2 + 15 \times 16^1 + 9 \times 16^0 + 0 \times 16^{-1} + 14 \times 16^{-2} + 11 \times 16^{-3})$

$40960 + 240 + 9 + 0.054 + 0.002 + 0.000109 = 41209.057$

Ans

Deci. Hexa.

| | |
|----|---|
| 8 | 8 |
| 9 | 9 |
| 10 | A |
| 11 | B |
| 12 | C |
| 13 | D |
| 14 | E |
| 15 | F |

3) Sum of $(27)_8$ & $(74)_8$ is $(X.Y)$

$(27)_8$

$+ (74)_8$

$(123)_8$

$(27)_8 + (74)_8 = (123)_8$

Ans

4) $(128)_{10} = (003)_b$ to find base b

the value of $x \Rightarrow \frac{128-3}{5} = 25$

$x = 25$

the value of $y \Rightarrow \frac{25}{5} = 5$

the base of number should be 5.

\therefore value of b is 5.

81115

5) $(A2C)_{16} = (X)_8$

A 2 C Hexadecimal
 $\downarrow \quad \downarrow \quad \downarrow$
 1010 0010 1100 binary

$\therefore (A2C)_{16} = (101000101100)_2$

00101000101100 binary
 $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$
 5 0 5 4 octal

$\therefore (101000101100)_2 = (5054)_8$

$\therefore (A2C)_{16} = (5054)_8 \therefore \Rightarrow X = 5054$ Ans

6) binary equivalent of 0.25

| | | |
|------------|------|---------|
| decimal | Ans. | integer |
| 0.25 X 2 = | 0.5 | 0 |
| 0.5 X 2 = | 1 | 1 |

$\therefore (0.25)_{10} = (0.01)_2$

7) value in hexadecimal form of $(18.675)_{10}$ Ans

~~18~~ converting 18 to hexadecimal form.

$\frac{18}{2} = 9 \quad \therefore (18)_{10} = (12)_{16}$

converting 0.675 to hexadecimal form:

| decimal number | integer part | equivalent hex. |
|----------------------------|--------------|-----------------|
| $10.675 \times 16 = 160.8$ | 10 | A. |
| $0.8 \times 16 = 12.8$ | 12 | C |
| $0.8 \times 16 = 12.8$ | 12 | C |
| $0.8 \times 16 = 12.8$ | 12 | C. |

decimal: $(0.675)_{10} = (ACC)_{16}$
(11001011)

$\therefore (18.675)_{10} = (12.ACC)_{16}$
Ans

8) If $(41/3) = 13$, the base of number system is

$41/3 = 13$
 $41 = 13 \times 3$
 $41 = 39$
 $41 - 39 = 2$
 $2 \times 3 = 6$
 $6 - 3 = 3$
 $3 \times 3 = 9$
 $9 - 3 = 6$
 $6 \times 3 = 18$
 $18 - 3 = 15$
 $15 \times 3 = 45$
 $45 - 3 = 42$
 $42 \times 3 = 126$
 $126 - 3 = 123$
 $123 \times 3 = 369$
 $369 - 3 = 366$
 $366 \times 3 = 1098$
 $1098 - 3 = 1095$
 $1095 \times 3 = 3285$
 $3285 - 3 = 3282$
 $3282 \times 3 = 9846$
 $9846 - 3 = 9843$
 $9843 \times 3 = 29529$
 $29529 - 3 = 29526$
 $29526 \times 3 = 88578$
 $88578 - 3 = 88575$
 $88575 \times 3 = 265725$
 $265725 - 3 = 265722$
 $265722 \times 3 = 797166$
 $797166 - 3 = 797163$
 $797163 \times 3 = 2391489$
 $2391489 - 3 = 2391486$
 $2391486 \times 3 = 7174458$
 $7174458 - 3 = 7174455$
 $7174455 \times 3 = 21523365$
 $21523365 - 3 = 21523362$
 $21523362 \times 3 = 64570086$
 $64570086 - 3 = 64570083$
 $64570083 \times 3 = 193710249$
 $193710249 - 3 = 193710246$
 $193710246 \times 3 = 581130738$
 $581130738 - 3 = 581130735$
 $581130735 \times 3 = 1743392205$
 $1743392205 - 3 = 1743392202$
 $1743392202 \times 3 = 5230176606$
 $5230176606 - 3 = 5230176603$
 $5230176603 \times 3 = 15690529809$
 $15690529809 - 3 = 15690529806$
 $15690529806 \times 3 = 47071589418$
 $47071589418 - 3 = 47071589415$
 $47071589415 \times 3 = 141214768245$
 $141214768245 - 3 = 141214768242$
 $141214768242 \times 3 = 423644304726$
 $423644304726 - 3 = 423644304723$
 $423644304723 \times 3 = 1270932914169$
 $1270932914169 - 3 = 1270932914166$
 $1270932914166 \times 3 = 3812798742498$
 $3812798742498 - 3 = 3812798742495$
 $3812798742495 \times 3 = 11438396227485$
 $11438396227485 - 3 = 11438396227482$
 $11438396227482 \times 3 = 34315188682446$
 $34315188682446 - 3 = 34315188682443$
 $34315188682443 \times 3 = 102945566047329$
 $102945566047329 - 3 = 102945566047326$
 $102945566047326 \times 3 = 308836698141978$
 $308836698141978 - 3 = 308836698141975$
 $308836698141975 \times 3 = 926509094425925$
 $926509094425925 - 3 = 926509094425922$
 $926509094425922 \times 3 = 2779527283277766$
 $2779527283277766 - 3 = 2779527283277763$
 $2779527283277763 \times 3 = 8338581849833289$
 $8338581849833289 - 3 = 8338581849833286$
 $8338581849833286 \times 3 = 25015745549499858$
 $25015745549499858 - 3 = 25015745549499855$
 $25015745549499855 \times 3 = 75047236648499565$
 $75047236648499565 - 3 = 75047236648499562$
 $75047236648499562 \times 3 = 225141709945498686$
 $225141709945498686 - 3 = 225141709945498683$
 $225141709945498683 \times 3 = 675425129836496049$
 $675425129836496049 - 3 = 675425129836496046$
 $675425129836496046 \times 3 = 2026275389509488138$
 $2026275389509488138 - 3 = 2026275389509488135$
 $2026275389509488135 \times 3 = 6078826168528464405$
 $6078826168528464405 - 3 = 6078826168528464402$
 $6078826168528464402 \times 3 = 18236478505585393206$
 $18236478505585393206 - 3 = 18236478505585393203$
 $18236478505585393203 \times 3 = 54709435516756179609$
 $54709435516756179609 - 3 = 54709435516756179606$
 $54709435516756179606 \times 3 = 164128306550268538818$
 $164128306550268538818 - 3 = 164128306550268538815$
 $164128306550268538815 \times 3 = 492384919650805616445$
 $492384919650805616445 - 3 = 492384919650805616442$
 $492384919650805616442 \times 3 = 1477154758952416849326$
 $1477154758952416849326 - 3 = 1477154758952416849323$
 $1477154758952416849323 \times 3 = 4431464276857250547969$
 $4431464276857250547969 - 3 = 4431464276857250547966$
 $4431464276857250547966 \times 3 = 13294392830571751643898$
 $13294392830571751643898 - 3 = 13294392830571751643895$
 $13294392830571751643895 \times 3 = 39883178491715254931685$
 $39883178491715254931685 - 3 = 39883178491715254931682$
 $39883178491715254931682 \times 3 = 119649535475145764795046$
 $119649535475145764795046 - 3 = 119649535475145764795043$
 $119649535475145764795043 \times 3 = 358948606425437294385129$
 $358948606425437294385129 - 3 = 358948606425437294385126$
 $358948606425437294385126 \times 3 = 1076845819276311883155378$
 $1076845819276311883155378 - 3 = 1076845819276311883155375$
 $1076845819276311883155375 \times 3 = 3230537457828935649466125$
 $3230537457828935649466125 - 3 = 3230537457828935649466122$
 $3230537457828935649466122 \times 3 = 9691612373486806948398366$
 $9691612373486806948398366 - 3 = 9691612373486806948398363$
 $9691612373486806948398363 \times 3 = 29074837120460420845195089$
 $29074837120460420845195089 - 3 = 29074837120460420845195086$
 $29074837120460420845195086 \times 3 = 87224511361381262535585258$
 $87224511361381262535585258 - 3 = 87224511361381262535585255$
 $87224511361381262535585255 \times 3 = 261673534084143787606755765$
 $261673534084143787606755765 - 3 = 261673534084143787606755762$
 $261673534084143787606755762 \times 3 = 785020602252431362820267286$
 $785020602252431362820267286 - 3 = 785020602252431362820267283$
 $785020602252431362820267283 \times 3 = 2355061806757294088460801849$
 $2355061806757294088460801849 - 3 = 2355061806757294088460801846$
 $2355061806757294088460801846 \times 3 = 7065185420271882265382405538$
 $7065185420271882265382405538 - 3 = 7065185420271882265382405535$
 $7065185420271882265382405535 \times 3 = 21195556260815646846147216605$
 $21195556260815646846147216605 - 3 = 21195556260815646846147216602$
 $21195556260815646846147216602 \times 3 = 63586668782446940538441649806$
 $63586668782446940538441649806 - 3 = 63586668782446940538441649803$
 $63586668782446940538441649803 \times 3 = 190759906347340821615324949409$
 $190759906347340821615324949409 - 3 = 190759906347340821615324949406$
 $190759906347340821615324949406 \times 3 = 572279719042022464845974848218$
 $572279719042022464845974848218 - 3 = 572279719042022464845974848215$
 $572279719042022464845974848215 \times 3 = 1716839157126067394537924544645$
 $1716839157126067394537924544645 - 3 = 1716839157126067394537924544642$
 $1716839157126067394537924544642 \times 3 = 5150517471378202183613773633926$
 $5150517471378202183613773633926 - 3 = 5150517471378202183613773633923$
 $5150517471378202183613773633923 \times 3 = 15451552414134606550841320899769$
 $15451552414134606550841320899769 - 3 = 15451552414134606550841320899766$
 $15451552414134606550841320899766 \times 3 = 46354657242403819652523962699298$
 $46354657242403819652523962699298 - 3 = 46354657242403819652523962699295$
 $46354657242403819652523962699295 \times 3 = 139063971727211458957571888097885$
 $139063971727211458957571888097885 - 3 = 139063971727211458957571888097882$
 $139063971727211458957571888097882 \times 3 = 417191915181634376872715664293646$
 $417191915181634376872715664293646 - 3 = 417191915181634376872715664293643$
 $417191915181634376872715664293643 \times 3 = 1251575745544903130618146992880929$
 $1251575745544903130618146992880929 - 3 = 1251575745544903130618146992880926$
 $1251575745544903130618146992880926 \times 3 = 3754727236634709391854440978642778$
 $3754727236634709391854440978642778 - 3 = 3754727236634709391854440978642775$
 $3754727236634709391854440978642775 \times 3 = 11264181709904128175563322935928325$
 $11264181709904128175563322935928325 - 3 = 11264181709904128175563322935928322$
 $11264181709904128175563322935928322 \times 3 = 33792545129712384526689968807784966$
 $33792545129712384526689968807784966 - 3 = 33792545129712384526689968807784963$
 $33792545129712384526689968807784963 \times 3 = 101377635389137153580069906423354889$
 $101377635389137153580069906423354889 - 3 = 101377635389137153580069906423354886$
 $101377635389137153580069906423354886 \times 3 = 304132906167411460740209719270064658$
 $304132906167411460740209719270064658 - 3 = 304132906167411460740209719270064655$
 $304132906167411460740209719270064655 \times 3 = 912398718502234382220629157810193965$
 $912398718502234382220629157810193965 - 3 = 912398718502234382220629157810193962$
 $912398718502234382220629157810193962 \times 3 = 2737196155506703146661887473430581886$
 $2737196155506703146661887473430581886 - 3 = 2737196155506703146661887473430581883$
 $2737196155506703146661887473430581883 \times 3 = 8211588466520109439985662420291745649$
 $8211588466520109439985662420291745649 - 3 = 8211588466520109439985662420291745646$
 $8211588466520109439985662420291745646 \times 3 = 24634765399560328319956987260875236938$
 $24634765399560328319956987260875236938 - 3 = 24634765399560328319956987260875236935$
 $24634765399560328319956987260875236935 \times 3 = 73904296198680984959870961782625710805$
 $73904296198680984959870961782625710805 - 3 = 73904296198680984959870961782625710802$
 $73904296198680984959870961782625710802 \times 3 = 221712888596042954879612885347877132406$
 $221712888596042954879612885347877132406 - 3 = 221712888596042954879612885347877132403$
 $221712888596042954879612885347877132403 \times 3 = 665138665788128864638838656043631397209$
 $665138665788128864638838656043631397209 - 3 = 665138665788128864638838656043631397206$
 $665138665788128864638838656043631397206 \times 3 = 1995415997364386593816515968130893991618$
 $1995415997364386593816515968130893991618 - 3 = 1995415997364386593816515968130893991615$
 $1995415997364386593816515968130893991615 \times 3 = 5986247992093159781449547904392681774845$
 $5986247992093159781449547904392681774845 - 3 = 5986247992093159781449547904392681774842$
 $5986247992093159781449547904392681774842 \times 3 = 17958743976279479344348643713178045324526$
 $17958743976279479344348643713178045324526 - 3 = 17958743976279479344348643713178045324523$
 $17958743976279479344348643713178045324523 \times 3 = 53876231928838438033045931139534135973569$
 $53876231928838438033045931139534135973569 - 3 = 53876231928838438033045931139534135973566$
 $53876231928838438033045931139534135973566 \times 3 = 161628695786515314099137793418602407920700$
 $161628695786515314099137793418602407920700 - 3 = 161628695786515314099137793418602407920697$
 $161628695786515314099137793418602407920697 \times 3 = 484886087359545942297413380255807223962091$
 $484886087359545942297413380255807223962091 - 3 = 484886087359545942297413380255807223962088$
 $484886087359545942297413380255807223962088 \times 3 = 1454658262078637827092240140767421671886264$
 $1454658262078637827092240140767421671886264 - 3 = 1454658262078637827092240140767421671886261$
 $1454658262078637827092240140767421671886261 \times 3 = 4363974786235913481276720422302265015658783$
 $4363974786235913481276720422302265015658783 - 3 = 4363974786235913481276720422302265015658780$
 $4363974786235913481276720422302265015658780 \times 3 = 13091924358707740443830161266906795047476340$
 $13091924358707740443830161266906795047476340 - 3 = 13091924358707740443830161266906795047476337$
 $13091924358707740443830161266906795047476337 \times 3 = 39275773076123221331490483800720385142429011$
 $39275773076123221331490483800720385142429011 - 3 = 39275773076123221331490483800720385142429008$
 $39275773076123221331490483800720385142429008 \times 3 = 117827319228369663994471451402161155427287024$
 $117827319228369663994471451402161155427287024 - 3 = 117827319228369663994471451402161155427287021$
 $117827319228369663994471451402161155427287021 \times 3 = 353481957685108991983414354206483466281861063$
 $353481957685108991983414354206483466281861063 - 3 = 353481957685108991983414354206483466281861060$
 $353481957685108991983414354206483466281861060 \times 3 = 1060445873055326975950243062619450398845583180$
 $1060445873055326975950243062619450398845583180 - 3 = 1060445873055326975950243062619450398845583177$
 $1060445873055326975950243062619450398845583177 \times 3 = 3181337619165980927850729187858351196536749531$
 $3181337619165980927850729187858351196536749531 - 3 = 3181337619165980927850729187858351196536749528$
 $3181337619165980927850729187858351196536749528 \times 3 = 9544012857497942783552187563575053589610248584$
 $9544012857497942783552187563575053589610248584 - 3 = 9544012857497942783552187563575053589610248581$
 $9544012857497942783552187563575053589610248581 \times 3 = 28632038572493828359656562690725160768830745743$
 $28632038572493828359656562690725160768830745743 - 3 = 28632038572493828359656562690725160768830745740$
 $28632038572493828359656562690725160768830745740 \times 3 = 8$

2^c complement of +45₁₀ is:

Finding 2^s complement of 0000101010

$$\begin{array}{r} \text{1st complement} \rightarrow 1111010101 \\ + 1 \\ \hline 1111010110 \end{array}$$

8-bit 2^s complement of (-45)₁₀ is

$$\begin{array}{c} (1111010110) \\ \text{sign} \quad \text{magnitude} \quad \text{Ans} \end{array}$$

17) decimal equivalent of (2124)₅

$$\begin{array}{c} (2) \quad 2 \quad 4 \\ \swarrow \quad \searrow \quad \downarrow \quad \swarrow \\ 2 \times 5^3 + 1 \times 5^2 + 2 \times 5^1 + 4 \times 5^0 = (2 \times 125) + (25) + (10) + 4 \\ = 289_{10} \end{array} \rightarrow \text{given}$$

$$\therefore (2124)_5 = (289)_{10} \quad \text{Ans}$$

12) given number $(3 \times 4096 + 15 \times 256 + 5 \times 16 + 3)$
also written as $(3 \times 6^3 + 15 \times 6^2 + 5 \times 6^1 + 3 \times 6^0)$

hex. equivalent (3F53)₁₆

binary equivalent $(11111101010011)_2$

total number of 1's $\rightarrow 10$

Ans

13) ~~decimal~~ 4-bit binary

14) decimal value of signed magnitude binary number (11101) is

$$\rightarrow (11101)_2 = (-13)_{10}$$

sign. magnitude

Ans -13

~~$$\begin{array}{r}
 1's \text{ complement } 00010 \\
 + \quad 1 \\
 \hline
 00011 \\
 (00011)_2 \rightarrow (3)_{10}
 \end{array}$$~~

15) Moore's law \rightarrow ~~option~~

✓ The number of transistors on a chip doubles every two years