

LEMBAR JAWABAN TUGAS MANDIRI 1
Alden Luthfi A – 2206028932 – PSD C

1.

No.	Base 10	Base 2	Base 4	Base 16	Base 9	Base 18
a.	100	1100100	1210	64	121	5A
b.	174	10101110	2232	AE	213	9C
c.	21	10101	111	15	23	13
d.	188	10111100	2330	BC	228	A8
e.	73	1001001	1021	49	81	41
f.	14	1110	32	E	15	E

2.

- a. $1001_2 + 13_4 = 20_8$
- b. $2022_{10} + 135_8 = 100001000011_2$
- c. $290822_{16} - 10010010_2 = 2688912_{10}$
- d. $6043_8 - 111001_2 = 101111101010_2$
- e. $110_2 * 1001_2 = 110110_2$
- f. $400_8 / 010_2 = 128_{10}$
- g. $B7_{16} * 302_4 = 10001110111110_2$
- h. $513_{10} / 11011_2 = 10011_2$

3. Error pada posisi bit ke-7

Pesan sebenarnya: 001011010101010

4.

- a. 101101_{gray}
- b. 010011_2

TUGAS MANDIRI 1 PSD

LEMBAR CARA

lufi

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1. a. Base 10 = 100

→ Base 2 = 100₁₀ : 2 = 50 rem 0

50 : 2 = 25 rem 0

25 : 2 = 12 rem 1

12 : 2 = 6 rem 0

6 : 2 = 3 rem 0

3 : 2 = 1 rem 1

1 : 2 = 0 rem 1

result : 100₁₀ = 1100100₂

→ Base 4 = 1100100₂

↳ 01100100

1 2 1 0

result : 100₁₀ = 1210₄

→ Base 16 = 1100100₂

↳ 01100100

6 Y

result : 100₁₀ = 64₁₆

→ Base 9 = 100₁₀

= 1 × 9² + 2 × 9 + 1

= 121₉

→ Base 18 = 100₁₈

= 5 × 18 + 10

= 5A₁₈

b. Base 16 = AE

→ Base 10 = 10 × 16 + 14

= 160 + 14

= 174₁₀

→ Base 2 = A E

result : 10101110₂

→ Base 4 = 10101110

2 2 3 2

result = 2232₄ = AE₁₆

A	1	0
B	1	1
C	1	2
D	1	3
E	1	4
F	1	5
G	1	6
H	1	7

$$\begin{aligned}\rightarrow \text{Base } 9 &= 174_{10} \\ &= 2 \times 9^2 + 1 \times 9^1 + 3 \\ &= 213_9\end{aligned}$$

$$\begin{aligned}\rightarrow \text{Base } 18 &= 174_{10} \\ &= 9 \times 18 + 12 \\ &= 9C_{18}\end{aligned}$$

$$\begin{aligned}\text{c. Base } 2 &: 10101 \\ \rightarrow \text{Base } 10 &= 2^4 + 2^2 + 2^0 \\ &= 16 + 4 + 1 \\ \text{result} &= 21_{10}\end{aligned}$$

$$\begin{aligned}\rightarrow \text{Base } 4 &: 10101 \\ &\quad 010101 \\ &\quad 111 \\ \text{result} &: 10101_2 = 111_4\end{aligned}$$

$$\begin{aligned}\rightarrow \text{Base } 16 &= 10101 \\ &\quad 00010101 \\ &\quad 15 \\ \text{result} &: 15_{16}\end{aligned}$$

$$\begin{aligned}\rightarrow \text{Base } 9 &= 21_{10} \\ &= 2 \times 9^1 + 3 \\ \text{result} &= 23_9 \\ \rightarrow \text{Base } 18 &= 21_{10} \\ &= 1 \times 18 + 3 \\ &= 13_{18}\end{aligned}$$

$$\text{d. Base } 18 : A8$$

$$\begin{aligned}\rightarrow \text{Base } 10 &= A8_{10} \\ &= 10 \times 18 + 8 \\ \text{result} &= 188_{10}\end{aligned}$$

$$\begin{aligned}\rightarrow \text{Base } 2 &= 188_{10} \\ &= 2^7 + 2^6 + 2^4 + 2^3 + 2^2 \\ &= 128 + 64 + 16 + 8 + 4\end{aligned}$$

$$\begin{aligned}\text{result} &= 10111100_2 \\ \rightarrow \text{Base } 4 &= 10111100_2 \\ &\quad 10111100 \\ &\quad 2330\end{aligned}$$

$$\text{result} = 2330_4 = A8_{18}$$

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$$\begin{aligned}\rightarrow \text{Base } 9 &= 2 \times 9^2 + 2 \times 9^1 + 8 \\ &= 228_9\end{aligned}$$

$$\begin{aligned}\rightarrow \text{Base } 16 &= 10111100 \\ &= B9_{16}\end{aligned}$$

$$\text{e. Base } 9 = 81$$

$$\begin{aligned}\rightarrow \text{Base } 10 &= 8 \times 9 + 1 \\ \text{result} &= 73_{10}\end{aligned}$$

$$\begin{aligned}\rightarrow \text{Base } 18 &= 73_{10} \\ &= 4 \times 18 + 1 \\ &= 41_{18}\end{aligned}$$

$$\begin{aligned}\rightarrow \text{Base } 2 &= 73 : 2 = 36 \text{ rem } 1 \\ &\quad 36 : 2 = 18 \text{ rem } 0 \\ &\quad 18 : 2 = 9 \text{ rem } 0 \\ &\quad 9 : 2 = 4 \text{ rem } 1 \\ &\quad 4 : 2 = 2 \text{ rem } 0 \\ &\quad 2 : 2 = 1 \text{ rem } 0 \\ &\quad 1 : 2 = 0 \text{ rem } 1\end{aligned}$$

$$\begin{aligned}\text{result} &= 1001001_2 \\ \rightarrow \text{Base } 4 &= 1001001_2 \\ &= 01001001 \\ &= 1021\end{aligned}$$

$$\begin{aligned}\text{result} &: 81_9 = 1021_4 \\ \rightarrow \text{Base } 16 &= 1001001_2 \\ &= 01001001 \\ &\quad 49\end{aligned}$$

$$\text{result} = 81_9 = 49_{16}$$

$$\text{f. Base } 4 = 32_4$$

$$\begin{aligned}\rightarrow \text{Base } 2 &= 32_4 \\ &= 32 \\ &= 1110\end{aligned}$$

$$\text{result} = 1110_2 = 32_4$$

$$\begin{aligned}\rightarrow \text{Base } 10 &= 32_{10} \\ &= 3 \times 4 + 2\end{aligned}$$

$$\text{result} = 14$$

$$\begin{aligned}\rightarrow \text{Base } 16 &= 14_{10} \\ \text{result} &= E_{16}\end{aligned}$$

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$$\begin{aligned} \rightarrow \text{Base } 9 &= 14_{10} \\ &= 1 \times 9^1 + 5 \\ \text{result} &= 15_9 = 32_4 \\ \rightarrow \text{Base } 18 &= 14_{10} \\ &= 18_8 = 32_4 \end{aligned}$$

$$\begin{aligned} 2. a. 1001_2 &= 11_8 \\ 13_4 &= 0111_2 = 7_8 \end{aligned}$$

Carry

$$\begin{array}{r} 1 \\ 11 \\ \hline 7 \\ 20_8 \end{array} +$$

$$\begin{aligned} b. 2022_{10} \\ 135_8 &= 64 + 24 + 5 \\ &= 93_{10} \end{aligned}$$

Carry

$$\begin{array}{r} 1 \\ 2022 \\ \hline 93 \\ 2115_{10} \end{array} +$$

$$= 2048 + 64 + 2 + 1$$

$$= 10000100001_2$$

$$c. 290822_{16} = 001010010001000000... \\ 1000000100010010000000...$$

Borrow

$$\begin{array}{r} 11111 \\ 100000100010001000 \\ \hline 100100100 \\ 0111100100000 \end{array} -$$

result

$$= 0010100100000$$

$$0111100100000_2 = 2688912_{10}$$

$$d. 6043_8 = 110000100011_2$$

Borrow

$$\begin{array}{r} 1111111 \\ 110000100011 \\ \hline 101111101010_2 \end{array} -$$

$$\begin{array}{r} e. 1001 \\ 110 \\ \hline 0000 \end{array} \times$$

$$\begin{array}{r} 1001 \\ 1001 \\ \hline 110110 \end{array} +$$

$$f. 4008 = 4 \times 64 = 256$$

$$010_2 = 2$$

$$256 / 2 = 128_{10}$$

$$\begin{array}{r} g. 87_{16} = 10110111 \\ 302_4 = 110010 \\ \hline 10110111 \\ 10110111 \\ \hline 10110111 \\ 1000111011110_2 \end{array} \times +$$

$$h. 11011 = 2^4 + 2^3 + 2^1 + 1 = 16 + 8 + 2 + 1 = 27$$

$$\frac{513}{27} = \frac{171}{9} = \frac{57}{3} = \frac{19}{1} = 19$$

$$= 2^4 + 2 + 1 = 10011_2$$

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3. Code:

0	0	1	0	1	1	1	1	0	1	0	1	0	1	0
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

parity 8:

parity 4:

parity 2:

parity 1:

Errors: 8 4 2 1 = pos: 7
0 1 1 1

Message: 001011010101010

4. a. 110110₂

MSB 1

XOR 01101 = 10110₁ gray

6011010_{gray}

MSB 0

XOR 10011 = 01001₂