Ahmad Ali Ahmad Othman - Section 1 - Sheet 1

1. Which of the following are analog quantities, and which are digital?

1. Number of atoms in a sample of material → Digital
2. Altitude of an aircraft → Analog
3. Pressure in a bicycle tire → Analog
4. Current through a speaker → Analog
5. Timer setting on a microwave oven → Digital

2. Which of the following are analog quantities, and which are digital?

1. Width of a piece of lumber → Analog
2. The amount of time before the oven buzzer goes off → Analog
3. The time of day displayed on a quartz watch → Display
4. Altitude above sea level measured on a staircase → Digital
5. Altitude above sea level measured on a ramp → Analog

3. Convert the following binary numbers to their equivalent decimal values:

A. 11001_2

$$11001_2 = 1 * 2^4 + 1 * 2^3 + 0 * 2^2 + 0 * 2^1 + 1 * 2^0 =$$

$$16 + 8 + 0 + 0 + 1 = 25_{10}$$

B. 1001.1001_2

$$1001.1001_2 = 1 * 2^3 + 0 * 2^2 + 0 * 2^1 + 1 * 2^0 + 1 * 2^{-1} + 0 * 2^{-2} + 0 * 2^{-3} + 1 * 2^{-4} =$$

$$8 + 0 + 0 + 1 + 0.5000 + 0 + 0 + 0.0625 = 9.5625_{10}$$

C. $01\ 00\ 11\ 01\ 10\ 01.10\ 11\ 00_2$

$$010011011001.10110_2 = 1 * 2^{10} + 0 * 2^9 + 0 * 2^8 + 1 * 2^7 + 1 * 2^6 + 0 * 2^5 + 1 * 2^4 + 1$$
$$+ 0 * 2^2 + 0 * 2^1 + 1 * 2^0 + 1 * 2^{-1} + 0 * 2^{-2} + 1 * 2^{-3} + 1 * 2^{-4} + 0 * 2^{-5} + 0 * 2^{-6}$$
$$1024 + 0 + 0 + 128 + 64 + 0 + 16 + 8 + 0 + 0 + 1$$
$$+ 0.500000 + 0 + 0.125000 + 0.062500 + 0 + 0 = 1241.6875_{10}$$

4. Convert the following binary numbers to decimal.

A. 100112_2

$$10011_2 = 1 * 2^4 + 0 * 2^3 + 0 * 2^2 + 1 * 2^1 + 1 * 2^0 =$$

$$16 + 0 + 0 + 2 + 1 = 19_{10}$$

(b) 1100.0101_2

$$1100.0101_2 = 1 * 2^3 + 1 * 2^2 + 0 * 2^1 + 0 * 2^0 + 0 * 2^{-1} + 1 * 2^{-2} + 0 * 2^{-3} + 1 * 2^{-4} =$$

$$8 + 4 + 0 + 0 + 0 + 0.2500 + 0 + 0.0625 = 12.3125_{10}$$

C. $01\ 00\ 11\ 10\ 01\ 00.10\ 01\ 00_2$

$$10011100100.10010_2 = 1 * 2^{10} + 0 * 2^9 + 0 * 2^8 + 1 * 2^7 + 1 * 2^6 + 1 * 2^5 + 0 * 2^4 + 0$$
$$+1 * 2^{-1} + 0 * 2^{-2} + 0 * 2^{-3} + 1 * 2^{-4} + 0 * 2^{-5} =$$
$$1024 + 0 + 0 + 128 + 64 + 32 + 0 + 0 + 4 + 0 + 0 + 0.5000 + 0 + 0 + 0.062$$

5. Using three bits, show the binary counting sequence from 000 to 111.

Decimal	Binary
0	000
1	001
2	010
3	011
4	100
5	101
6	110
7	111

6. Using six bits, show the binary counting sequence from 000000 to 111111.

Decimal	Binary	Decimal	Binary
0	000000	32	100000
1	000001	33	100001
2	000010	34	100010
3	000011	35	100011
4	000100	36	100100
5	000101	37	100101
6	000110	38	100110
7	000111	39	100111
8	001000	40	101000
9	001001	41	101001
10	001010	42	101010
11	001011	43	101011
12	001100	44	101100

Decimal	Binary	Decimal	Binary
13	001101	45	101101
14	001110	46	101110
15	001111	47	101111
16	010000	48	110000
17	010001	49	110001
18	010010	50	110010
19	010011	51	110011
20	010100	52	110100
21	010101	53	110101
22	010110	54	110110
23	010111	55	110111
24	011000	56	111000
25	011001	57	111001
26	011010	58	111010
27	011011	59	111011
28	011100	60	111100
29	011101	61	111101
30	011110	62	111110
31	011111	63	111111

7. What is the maximum number that we can count up to using 10 bits?

General rule: $2^{bits} - 1$

$2^{10} - 1 = 1023$

8. What is the maximum number that we can count up to using 14 bits?

$2^{14} - 1 = 16383$

9. How many bits are needed to count up to a maximum of 511?

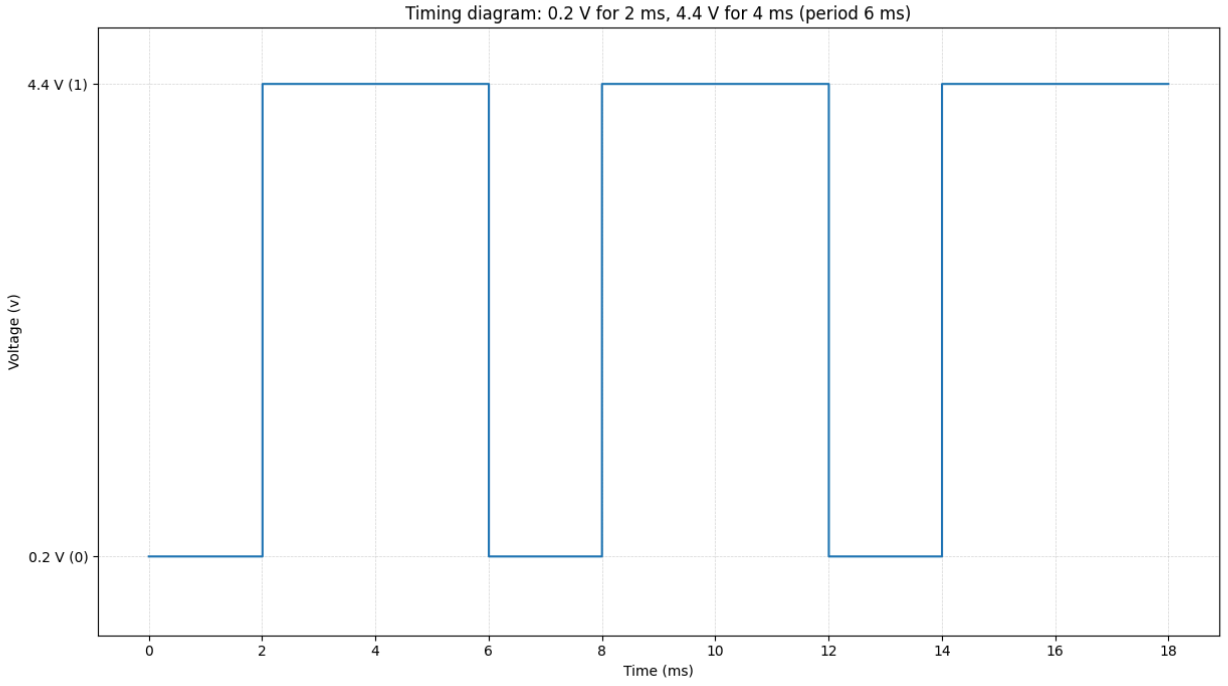
General rule: $\lceil \log_2(max) \rceil$ → Ceil the log2 of the maximum.

$2^n - 1 = 511,\ 2^n = 512,\ n = 9$ or $\log_2(512) = 9$

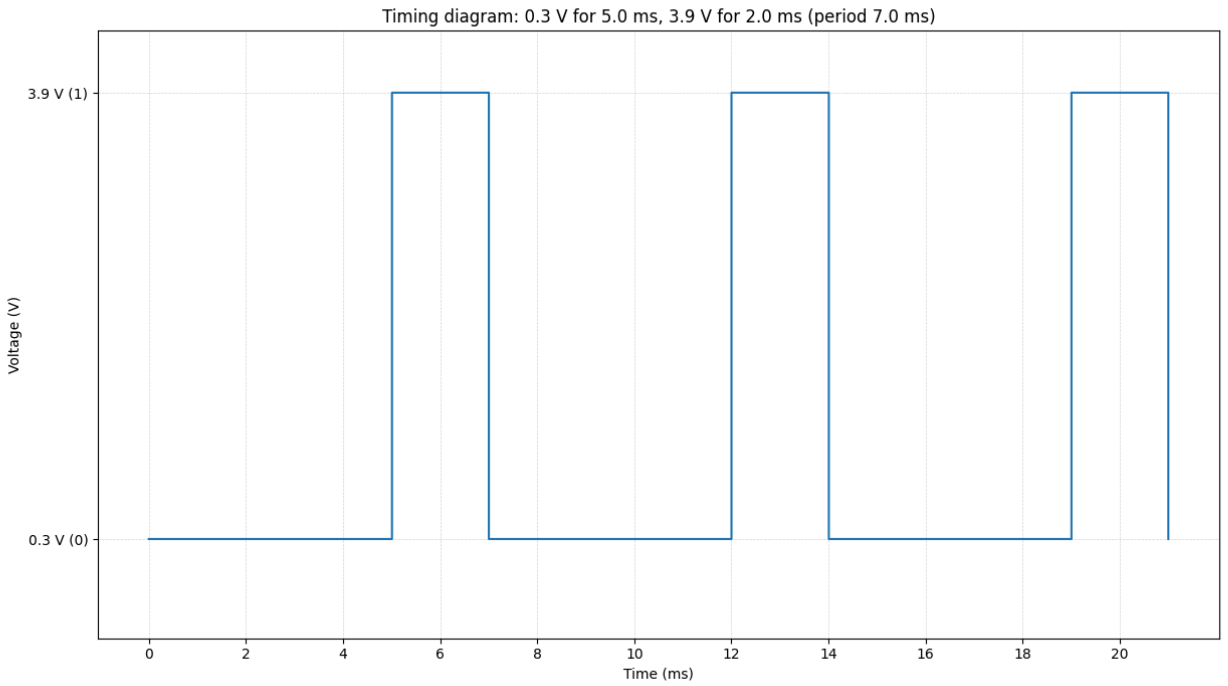
10. How many bits are needed to count up to a maximum of 63?

$2^n - 1 = 63,\ 2^n = 64,\ n = 6$ or $\log_2(64) = 6$

11. Draw the timing diagram for a digital signal that continuously alternates between 0.2 V (binary 0) for 2 ms and 4.4 V (binary 1) for 4 ms.



12. Draw the timing diagram for a signal that alternates between 0.3 V (binary 0) for 5 ms and 3.9 V (binary 1) for 2 ms.



13. Suppose that the decimal integer values from 0 to 15 are to be transmitted in binary.

0. Numbers0 to 15 are represented by 4 bits ($2^4 = 16$).
1. How many lines will be needed if parallel representation is used?
    - Parallel representation sends all bits simultaneously (at the same time), each on its own separate line.
    - That means it would use **4 Lines**.
2. How many will be needed if serial representation is used?
    - Serial representation sends all bits sequentially one after the other, using a single line.
    - It would use **1 Line**.

14. How is a microprocessor different from a microcomputer?

Microprocessor

- A microprocessor is a single processor core that fetches, decodes, and executes instructions.
- It requires external memory (ROM/RAM), a memory decoder, an oscillator, and I/O ports to form a complete microcomputer.
- Handles arithmetic, logic, and control operations — cannot operate alone.

Microcomputer

- A complete computer system built around a microprocessor.
- Consists of the **microprocessor + memory (RAM/ROM) + I/O ports + storage + power supply**, etc.
- Fully functional — capable of running programs and performing tasks independently.

15. How is a microcontroller different from a microcomputer?

Microcontroller

- A microcontroller is a compact system-on-chip (SoC) with an integrated CPU, memory (RAM, ROM), and programmable I/O peripherals, designed for specific tasks.
- Used for dedicated control tasks in embedded systems (e.g., washing machines, sensors, robotics).
- Optimized for **control and efficiency**, not high-speed computing.

Microcomputer

- A **complete general-purpose computing system** that may use a microprocessor or microcontroller as its CPU.
- Used for general-purpose computing (e.g., personal computers, workstations).
- Optimized for **flexibility** and **processing power**.

Ahmad Ali Ahmad Othman - Section 1 - Sheet 2

1. Convert these binary numbers to decimal.

A. $0001\ 0110_2$

$$10110_2 = 1 * 2^4 + 0 * 2^3 + 1 * 2^2 + 1 * 2^1 + 0 * 2^0 =$$
$$16 + 4 + 2 = 22_{10}$$

B. $1001\ 0101_2$

$$10010101_2 = 1 * 2^7 + 0 * 2^6 + 0 * 2^5 + 1 * 2^4 + 0 * 2^3 + 1 * 2^2 + 0 * 2^1 + 1 * 2^0 =$$

$$128 + 16 + 4 + 1 = 149_{10}$$

C. $1001\ 0000\ 1001_2$

$$100100001001_2 = 1 * 2^{11} + 0 * 2^{10} + 0 * 2^9 + 1 * 2^8 + 0 * 2^7 + 0 * 2^6 + 0 * 2^5 +$$
$$0 * 2^4 + 1 * 2^3 + 0 * 2^2 + 0 * 2^1 + 1 * 2^0 =$$

$$2048 + 256 + 8 + 1 = 2313_{10}$$

D. $0110\ 1011_2$

$$1101011_2 = 1 * 2^6 + 1 * 2^5 + 0 * 2^4 + 1 * 2^3 + 0 * 2^2 + 1 * 2^1 + 1 * 2^0 =$$

$$64 + 32 + 8 + 2 + 1 = 107_{10}$$

E. $1111\ 1111_2$

$$11111111_2 = 1 * 2^7 + 1 * 2^6 + 1 * 2^5 + 1 * 2^4 + 1 * 2^3 + 1 * 2^2 + 1 * 2^1 + 1 * 2^0 =$$

$$128 + 64 + 32 + 16 + 8 + 4 + 2 + 1 = 255_{10}$$

F. $0110\ 1111_2$

$$1101111_2 = 1 * 2^6 + 1 * 2^5 + 0 * 2^4 + 1 * 2^3 + 1 * 2^2 + 1 * 2^1 + 1 * 2^0 =$$

$$64 + 32 + 8 + 4 + 2 + 1 = 111_{10}$$

G. $0011\ 1101\ 0111_2$

$$1111010111_2 = 1 * 2^9 + 1 * 2^8 + 1 * 2^7 + 1 * 2^6 + 0 * 2^5 +$$
$$1 * 2^4 + 0 * 2^3 + 1 * 2^2 + 1 * 2^1 + 1 * 2^0 =$$

$$512 + 256 + 128 + 64 + 16 + 4 + 2 + 1 = 983_{10}$$

H. $1101\ 1111_2$

$$11011111_2 = 1 * 2^7 + 1 * 2^6 + 0 * 2^5 + 1 * 2^4 + 1 * 2^3 + 1 * 2^2 + 1 * 2^1 + 1 * 2^0 =$$

$$128 + 64 + 16 + 8 + 4 + 2 + 1 = 223_{10}$$

2. Convert the following decimal values to binary.

n	2^n	n	2^n
0	1	6	64
1	2	7	128
2	4	8	256
3	8	9	512
4	16	10	1024
5	32	11	2048

A. 37

$$37_{10} = 32 + 4 + 1$$
$$= 2^5 + 0 + 0 + 2^2 + 2^1 + 0 = 0010\ 0110_2$$

B. 13

$$13_{10} = 8 + 4 + 1$$
$$= 2^3 + 2^2 + 0 + 2^0 = 1101_2$$

C. 189

$$189_{10} = 128 + 32 + 16 + 8 + 4 + 1$$
$$= 2^7 + 0 + 2^5 + 2^4 + 2^3 + 2^2 + 0 + 2^0 = 1011\ 1101_2$$

D. 1000

$$1000_{10} = 512 + 256 + 128 + 64 + 32 + 8$$
$$= 2^9 + 2^8 + 2^7 + 2^6 + 2^5 + 0 + 2^3 + 0 + 0 + 0 = 0011\ 1110\ 1000_2$$

E. 77

$$77_{10} = 64 + 8 + 4 + 1$$
$$= 2^6 + 0 + 0 + 2^3 + 2^2 + 0 + 2^0$$
$$= 0100\ 1101_2$$

F. 390

$$390_{10} = 256 + 128 + 4 + 2$$
$$= 2^8 + 2^7 + 0 + 0 + 0 + 0 + 2^2 + 2^1 + 0$$
$$= 0001\ 1000\ 0110_2$$

G. 205

$$205_{10} = 128 + 64 + 8 + 4 + 1$$
$$= 2^7 + 2^6 + 0 + 0 + 2^3 + 2^2 + 0 + 2^0$$
$$= 1100\ 1101_2$$

H. 2133

$$2133_{10} = 2048 + 64 + 16 + 4 + 1$$
$$= 2^{11} + 0 + 0 + 0 + 0 + 2^6 + 0 + 2^4 + 0 + 2^2 + 0 + 2^0$$
$$= 0100\ 0010\ 0101_2$$

I. 511

$$511_{10} = 256 + 128 + 64 + 32 + 16 + 8 + 4 + 2 + 1$$
$$= 2^8 + 2^7 + 2^6 + 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0$$
$$= 0001\ 1111\ 1111_2$$

3.What is the largest decimal value that can be represented by:

A. 8-bit binary number?

$2^7 + 2^6 + 2^5 + 2^4 + 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0 = 255_{10}$ or simply $2^8 - 1 = 255_{10}$

B. 16-bit number?

$2^{16} - 1 = 65,536_{10}$

4. Convert each hex number to its decimal equivalent.

A. 743_{16}

$$743_{16} = 7 * 16^2 + 4 * 16^1 + 3 * 16^0 = \\ 1792 + 64 + 3 = 1859_{10}$$

B. 36_{16}

$$36_{16} = 3 * 16^1 + 6 * 16^0 = \\ 48 + 6 = 54_{10}$$

C. $37FD_{16}$

$$37FD_{16} = 3 * 16^3 + 7 * 16^2 + 15 * 16^1 + 13 * 16^0 = \\ 12288 + 1792 + 240 + 13 = 14077_{10}$$

D. 2000_{16}

$$2000_{16} = 2 * 16^3 + 0 * 16^2 + 0 * 16^1 + 0 * 16^0 = \\ 8192 + 0 + 0 + 0 = 8192_{10}$$

E. 165_{16}

$$165_{16} = 1 * 16^2 + 6 * 16^1 + 5 * 16^0 = \\ 256 + 96 + 5 = 357_{10}$$

F. $ABCD0_{16}$

$$ABCD0_{16} = 10 * 16^4 + 11 * 16^3 + 12 * 16^2 + 13 * 16^1 + 0 * 16^0 =$$
$$655360 + 45056 + 3072 + 208 + 0 = 703696_{10}$$

G. $7FF_{16}$

$$7FF_{16} = 7 * 16^2 + 15 * 16^1 + 15 * 16^0 =$$
$$1792 + 240 + 15 = 2047_{10}$$

H. 1204_{16}

$$1204_{16} = 1 * 16^3 + 2 * 16^2 + 0 * 16^1 + 4 * 16^0 =$$
$$4096 + 512 + 0 + 4 = 4612_{10}$$

5. Convert each of the following decimal numbers to hex.

A. 59_{10}

$$59/16 = 3.6875 \Rightarrow 11$$
$$3/16 = 0 \Rightarrow 3$$
$$59_{10} = 3B_{16}$$

B. 372_{10}

$$372/16 = 23.25 \Rightarrow 4$$
$$23/16 = 1.4375 \Rightarrow 7$$
$$1/16 = 0 \Rightarrow 1$$
$$372_{10} = 174_{16}$$

C. 919_{10}

$$919/16 = 57.4375 \Rightarrow 7$$
$$57/16 = 3.5625 \Rightarrow 9$$
$$3/16 = 0 \Rightarrow 3$$
$$919_{10} = 397_{16}$$

D. 1024_{10}

$$1024/16 = 64 \Rightarrow 0$$
$$64/16 = 4 \Rightarrow 0$$
$$4/16 = 0.25 \Rightarrow 4$$
$$1024_{10} = 400_{16}$$

E. 771_{10}

$$771/16 = 48.1875 \Rightarrow 3$$
$$48/16 = 3 \Rightarrow 0$$
$$3/16 = 0.1875 \Rightarrow 3$$
$$771_{10} = 303_{16}$$

F. 2313_{10}

$$2313/16 = 144.5625 \Rightarrow 9$$
$$144/16 = 9 \Rightarrow 0$$
$$9/16 = 0.5625 \Rightarrow 9$$
$$2313_{10} = 909_{16}$$

G. $65,536_{10}$

$$65536/16 = 4096 \Rightarrow 0$$
$$4096/16 = 256 \Rightarrow 0$$
$$256/16 = 16 \Rightarrow 0$$
$$16/16 = 1 \Rightarrow 0$$
$$1/16 = 0.0625 \Rightarrow 1$$
$$65536_{10} = 10000_{16}$$

H. 255_{10}

$$255/16 = 15.9375 \Rightarrow 15(F)$$
$$15/16 = 0.9375 \Rightarrow 15(F)$$
$$255_{10} = FF_{16}$$

6. Convert each of the hex values from Problem 4 to binary.

Hex	Binary	Hex	Binary
0	0000	8	1000
1	0001	9	1001
2	0010	A	1010
3	0011	B	1011
4	0100	C	1100
5	0101	D	1101
6	0110	E	1110
7	0111	F	1111

A. 743_{16}

$$7_{16} \Rightarrow 0111_2$$
$$4_{16} \Rightarrow 0100_2$$
$$3_{16} \Rightarrow 0011_2$$
$$743_{16} = 0111\ 0100\ 0011_2$$

B. 36_{16}

$$3_{16} \Rightarrow 0011_2$$
$$6_{16} \Rightarrow 0110_2$$
$$36_{16} = 0011\ 0110_2$$

C. $37FD_{16}$

$$3_{16} \Rightarrow 0011_2$$
$$7_{16} \Rightarrow 0111_2$$
$$F_{16} \Rightarrow 1111_2$$
$$D_{16} \Rightarrow 1101_2$$
$$37FD_{16} = 0011\ 0111\ 1111\ 1101_2$$

D. 2000_{16}

$$2_{16} \Rightarrow 0010_2$$
$$0_{16} \Rightarrow 0000_2$$
$$0_{16} \Rightarrow 0000_2$$
$$0_{16} \Rightarrow 0000_2$$
$$2000_{16} = 0010\ 0000\ 0000\ 0000_2$$

E. 165_{16}

$$1_{16} \Rightarrow 0001_2$$
$$6_{16} \Rightarrow 0110_2$$
$$5_{16} \Rightarrow 0101_2$$
$$165_{16} = 0001\ 0110\ 0101_2$$

F. $ABCD0_{16}$

$$A_{16} \Rightarrow 1010_2$$
$$B_{16} \Rightarrow 1011_2$$
$$C_{16} \Rightarrow 1100_2$$
$$D_{16} \Rightarrow 1101_2$$
$$0_{16} \Rightarrow 0000_2$$
$$ABCD0_{16} = 1010\ 1011\ 1100\ 1101\ 0000_2$$

G. $7FF_{16}$

$$7_{16} \Rightarrow 0111_2$$
$$F_{16} \Rightarrow 1111_2$$
$$F_{16} \Rightarrow 1111_2$$
$$7FF_{16} = 0111\ 1111\ 1111_2$$

H. 1204_{16}

$$1_{16} \Rightarrow 0001_2$$
$$2_{16} \Rightarrow 0010_2$$
$$0_{16} \Rightarrow 0000_2$$
$$4_{16} \Rightarrow 0100_2$$
$$1204_{16} = 0001\ 0010\ 0000\ 0100_2$$

7. Convert the binary numbers in Problem 1 to hex.

A. $0001\ 0110_2$

$$0001_2 \Rightarrow 1_{16}\ 0110_2 \Rightarrow 6_{16}\ 0001\ 0110_2 = 16_{16}$$

B. $1001\ 0101_2$

$$1001_2 \Rightarrow 9_{16}\ 0101_2 \Rightarrow 5_{16}\ 1001\ 0101_2 = 95_{16}$$

C. $1001\ 0000\ 1001_2$

$$0001\ 0000\ 1001_2\ 0001_2 \Rightarrow 1_{16}\ 0000_2 \Rightarrow 0_{16}\ 1001_2 \Rightarrow 9_{16}\ 0001\ 0000\ 1001_2 = 109_{16}$$

D. $0110\ 1011_2$

$$0110_2 \Rightarrow 6_{16}\ 1011_2 \Rightarrow B_{16}\ 0110\ 1011_2 = 6B_{16}$$

E. $1111\ 1111_2$

$$1111_2 \Rightarrow F_{16}\ 1111_2 \Rightarrow F_{16}\ 1111\ 1111_2 = FF_{16}$$

F. $0110\ 1111_2$

$$0110_2 \Rightarrow 6_{16}\ 1111_2 \Rightarrow F_{16}\ 0110\ 1111_2 = 6F_{16}$$

G. $0001\ 11101\ 0111_2$

$$0001\ 1110\ 1011_2\ 0001_2 \Rightarrow 1_{16}\ 1110_2 \Rightarrow E_{16}\ 1011_2 \Rightarrow B_{16}\ 0001\ 1110\ 1011_2 = 1EB_{16}$$

H. $1101\ 1111_2$

$$1101_2 \Rightarrow D_{16}\ 1111_2 \Rightarrow F_{16}\ 1101\ 1111_2 = DF_{16}$$

9. When a large decimal number is to be converted to binary, it is sometimes easier to convert it first to hex, and then from hex to binary. Try this procedure for 2133_{10} and compare it with the procedure used in Problem 2 (h).

First: decimal to hex

$$2133/16 = 133.3125 \Rightarrow 5$$
$$133/16 = 8.3125 \Rightarrow 5$$
$$8/16 = 0.5 \Rightarrow 8$$
$$2133_{10} = 855_{16}$$

Second: hex to binary

$$8_{16} \Rightarrow 1000_2$$
$$5_{16} \Rightarrow 0101_2$$
$$5_{16} \Rightarrow 0101_2$$
$$855_{16} = 1000\ 0101\ 0101_2$$

10. How many hex digits are required to represent decimal numbers up to 20,000?

General rule: digits equals the log_{base} of maximum (ceiled) ⇒ $\lceil log_{base}(maximum) \rceil$

Answer: $\lceil log_{16}(20000) \rceil = 4$ ⇒ We need 4 digits.

11. Convert these hex values to decimal.

A. 92_{16}

$$92_{16} = 9 * 16^1 + 2 * 16^0 =$$
$$144 + 2 = 146_{10}$$

B. $1A6_{16}$

$$1A6_{16} = 1 * 16^2 + 10 * 16^1 + 6 * 16^0 =$$
$$256 + 160 + 6 = 422_{10}$$

C. $37FD_{16}$

$$37FD_{16} = 3 * 16^3 + 7 * 16^2 + 15 * 16^1 + 13 * 16^0 =$$
$$12288 + 1792 + 240 + 13 = 14333_{10}$$

D. $ABCD_{16}$

$$ABCD_{16} = 10 * 16^3 + 11 * 16^2 + 12 * 16^1 + 13 * 16^0 =$$
$$40960 + 2816 + 192 + 13 = 43981_{10}$$

E. $000F_{16}$

$$000F_{16} = 0 * 16^3 + 0 * 16^2 + 0 * 16^1 + 15 * 16^0 =$$
$$0 + 0 + 0 + 15 = 15_{10}$$

F. 55_{16}

$$55_{16} = 5 * 16^1 + 5 * 16^0 =$$
$$80 + 5 = 85_{10}$$

G. $2C0_{16}$

$$2C0_{16} = 2 * 16^2 + 12 * 16^1 + 0 * 16^0 =$$
$$512 + 192 + 0 = 704_{10}$$

H. $7FF_{16}$

$$7FF_{16} = 7 * 16^2 + 15 * 16^1 + 15 * 16^0 =$$
$$1792 + 240 + 15 = 2047_{10}$$

12. Convert these decimal values to hex.

A. 75_{10}

$$75/16 = 4.6875 \Rightarrow 11$$
$$4/16 = 0.25 \Rightarrow 4$$
$$75_{10} = 4B$$

B. 314_{10}

$$314/16 = 19.625 \Rightarrow 10$$
$$19/16 = 1.1875 \Rightarrow 3$$
$$1/16 = 0.0625 \Rightarrow 1$$
$$314_{10} = 13A_{16}$$

C. 2048_{10}

$$2048/16 = 128 \Rightarrow 0$$
$$128/16 = 8 \Rightarrow 0$$
$$8/16 = 0.5 \Rightarrow 8$$
$$2048_{10} = 800_{16}$$

D. 24_{10}

$$24/16 = 1.5 \Rightarrow 8$$
$$1/16 = 0.0625 \Rightarrow 1$$
$$24_{10} = 18_{16}$$

E. 7245_{10}

$$7245/16 = 452.8125 \Rightarrow 13$$
$$452/16 = 28.25 \Rightarrow 12$$
$$28/16 = 1.75 \Rightarrow 12$$
$$1/16 = 0.0625 \Rightarrow 1$$
$$7245_{10} = 1CCD_{16}$$

F. 498_{10}

$$498/16 = 31.125 \Rightarrow 2$$
$$31/16 = 1.9375 \Rightarrow 15$$
$$1/16 = 0.0625 \Rightarrow 1$$
$$498_{10} = 1F2_{16}$$

G. $25,619_{10}$

$$25619/16 = 1601.1875 \Rightarrow 3$$
$$1601/16 = 100.0625 \Rightarrow 1$$
$$100/16 = 6.25 \Rightarrow 4$$
$$6/16 = 0.375 \Rightarrow 6$$
$$25619_{10} = 6413_{16}$$

H. 4095_{10}

$$4095/16 = 255.9375 \Rightarrow 15$$
$$255/16 = 15.9375 \Rightarrow 15$$
$$15/16 = 0.9375 \Rightarrow 15$$
$$4095_{10} = FFF_{16}$$