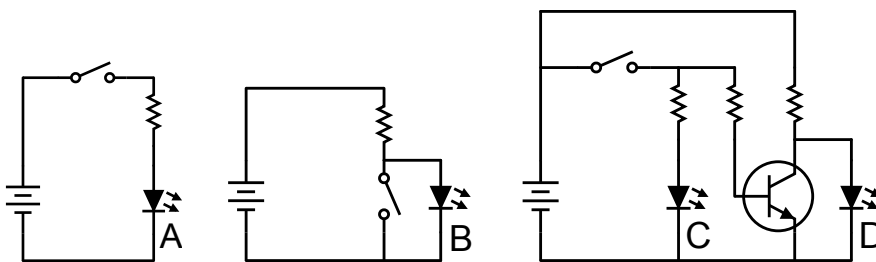


Digital Storage – Octal and Hexadecimal

Data Storage – Zeros and Ones

1. Write the name of a semiconductor device that can be used as a switch and is one of the basic building blocks of modern digital electronic circuits?

2. For the light-emitting diodes (LED) labelled A through D in the circuits to the left, state whether it is “on” or “off” when the manual switch in the circuit is open and when it is closed.



Switch is opened:

Switch is closed:

A	B	C	D

Digital Storage – Number Systems: Octal

3. Count in octal. Write the octal equivalent below each decimal number.

Decimal	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Octal																					

4. Addition and multiplication of octal numbers. Fill in the boxes with the appropriate values.

$$\begin{array}{r} 417 \\ + 235 \\ \hline \end{array}$$

$$\begin{array}{r} 637 \\ + 547 \\ \hline \end{array}$$

$$\begin{array}{r} 765 \\ + 567 \\ \hline \end{array}$$

$$\begin{array}{r} 376 \\ \times 25 \\ \hline \end{array}$$

$$\begin{array}{r} 702 \\ \times 57 \\ \hline \end{array}$$

Octal Multiplication Table

	1	2	3	4	5	6	7
1	1	2	3	4	5	6	7
2	2	4	6	10	12	14	16
3	3	6	11	14	17	22	25
4	4	10	14	20	24	30	34
5	5	12	17	24	31	36	43
6	6	14	22	30	36	44	52
7	7	16	25	34	43	52	61

5. Show the steps to convert the given octal number into decimal.

$$\begin{aligned} 0362 &= 3 \times \boxed{} + 6 \times \boxed{} + 2 \times \boxed{} \\ &= \boxed{} + \boxed{} + \boxed{} \\ &= \boxed{} \end{aligned}$$

Digital Storage – Octal and Hexadecimal**Digital Storage – Number Systems: Hexadecimal**

6. Count in hexadecimal. Write the hexadecimal equivalent below each decimal number.

Decimal	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Hexadecimal																					

7. Addition and multiplication of hexadecimal numbers. Fill in the boxes with the appropriate values.

$$\begin{array}{r} D1E \\ + 7E2 \\ \hline \square\square\square\square \end{array} \quad \begin{array}{r} ABC \\ + DEF \\ \hline \square\square\square\square \end{array}$$

$$\begin{array}{r} A1D \\ \times 37 \\ \hline \square\square\square\square \\ \square\square\square\square\square \\ \hline \square\square\square\square\square \end{array}$$

Hexadecimal Multiplication Table

	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
1	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
2	2	4	6	8	A	C	E	10	12	14	16	18	1A	1C	1E
3	3	6	9	C	F	12	15	18	1B	1E	21	24	27	2A	2D
4	4	8	C	10	14	18	1C	20	24	28	2C	30	34	38	3C
5	5	A	F	14	19	1E	23	28	2D	32	37	3C	41	46	4B
6	6	C	12	18	1E	24	2A	30	36	3C	42	48	4E	54	5A
7	7	E	15	1C	23	2A	31	38	3F	46	4D	54	5B	62	69
8	8	10	18	20	28	30	38	40	48	50	58	60	68	70	78
9	9	12	1B	24	2D	36	3F	48	51	5A	63	6C	75	7E	87
A	A	14	1E	28	32	3C	46	50	5A	64	6E	78	82	8C	96
B	B	16	21	2C	37	42	4D	58	63	6E	79	84	8F	9A	A5
C	C	18	24	30	3C	48	54	60	6C	78	84	90	9C	A8	B4
D	D	1A	27	34	41	4E	5B	68	75	82	8F	9C	A9	B6	C3
E	E	1C	2A	38	46	54	62	70	7E	8C	9A	A8	B6	C4	D2
F	F	1E	2D	3C	4B	5A	69	78	87	96	A5	B4	C3	D2	E1

8. Show the steps to convert the given hexadecimal number into decimal.

$$\begin{aligned} 0 \times 5AD &= \square \times \square + \square \times \square + \square \times \square \\ &= \square + \square + \square \\ &= \square \end{aligned}$$

9. Show the steps to convert the given decimal number into hexadecimal using the division method.

$$\begin{aligned} 2989 \div 16 &= \square^{\text{decimal}} R \square^{\text{hex}} = \square \\ \square \div 16 &= \square R \square = \square \\ \square \div 16 &= \square R \square = \square \end{aligned} \quad \begin{array}{l} \text{final answer} \\ 0 \times \square \end{array}$$

10. Convert the hexadecimal numbers to decimal, and the decimal number to hexadecimal: Show your work in the box.

a) **0x63**c) **127**b) **0xF1**d) **273**