

S3 Binary Number – Revision Answer

1. Convert the following decimal numbers to binary numbers.
(Show your steps clearly)
 - (a) $34_{(10)} = 100010_{(2)}$
 - (b) $57_{(10)} = 111001_{(2)}$
 - (c) $64_{(10)} = 1000000_{(2)}$
2. Convert the following binary numbers to decimal numbers.
(Show your steps clearly)
 - (a) $1101011_{(2)} = 64 + 32 + 8 + 2 + 1 = 107_{(10)}$
 - (b) $1011010_{(2)} = 64 + 16 + 8 + 2 = 90_{(10)}$
 - (c) $110101_{(2)} = 32 + 16 + 4 + 1 = 53_{(10)}$
3. Convert the following binary numbers to hexadecimal numbers.
 - (a) $1101\ 1011_{(2)} = \text{DB}_{(16)}$
 - (b) $1101\ 1100_{(2)} = \text{DC}_{(16)}$
 - (c) $11\ 0101_{(2)} = 35_{(16)}$
4. Convert the following hexadecimal numbers to binary numbers.
 - (a) $\text{A6}_{(16)} = 1010\ 0110_{(2)}$
 - (b) $\text{D0}_{(16)} = 1101\ 0000_{(2)}$
 - (c) $\text{CF}_{(16)} = 1100\ 1111_{(2)}$
5. Convert the following binary numbers to decimal numbers.
(Show your steps clearly)
 - (a) $11010.101_{(2)} = 16 + 8 + 2 + 0.5 + 0.125 = 26.625_{(10)}$
 - (b) $1011.1011_{(2)} = 8 + 2 + 1 + 0.5 + 0.125 + 0.0625 = 11.6875_{(10)}$
 - (c) $11011.001_{(2)} = 16 + 8 + 2 + 1 + 0.125 = 27.125_{(10)}$
 - (d) $1101.0011_{(2)} = 8 + 4 + 1 + 0.125 + 0.0625 = 13.1875_{(10)}$
6. Convert the following decimal numbers to binary numbers.
(Show your steps clearly)
 - (a) $31.75_{(10)} = 11111.11_{(2)}$
 - (b) $20.375_{(10)} = 10100.011_{(2)}$
 - (c) $12.625_{(10)} = 1100.101_{(2)}$
 - (d) $25.875_{(10)} = 11001.111_{(2)}$
7. Convert the following binary numbers to hexadecimal numbers.
 - (a) $1101.1101_{(2)} = \text{D.D}_{(16)}$
 - (b) $1101\ 1100.101_{(2)} = \text{DC.A}_{(16)}$
 - (c) $110.1111_{(2)} = 6.\text{F}_{(16)}$
 - (d) $1001.1001_{(2)} = 9.9_{(16)}$
8. Convert the following hexadecimal numbers to binary numbers.
 - (a) $\text{A6.D}_{(16)} = 1010\ 0110.1101_{(2)}$
 - (b) $\text{D0.3}_{(16)} = 1101\ 0000.0011_{(2)}$
 - (c) $\text{C.AD}_{(16)} = 1100.10101101_{(2)}$

9. Calculate the followings and show your working steps clearly.

- (a) $110011_{(2)} + 1011_{(2)} = 111110_{(2)}$
- (b) $11101011_{(2)} + 110011_{(2)} = 100011110_{(2)}$
- (c) $11010111_{(2)} - 10011_{(2)} = 11000100_{(2)}$
- (d) $100001_{(2)} - 1111_{(2)} = 10010_{(2)}$
- (e) $110011_{(2)} \times 101_{(2)} = 11111111_{(2)}$
- (f) $110101_{(2)} \times 111_{(2)} = 101110011_{(2)}$
- (g) $1100101_{(2)} \div 1011_{(2)} = 1001_{(2)} \dots 10_{(2)}$
- (h) $111011_{(2)} \div 101_{(2)} = 1011_{(2)} \dots 100_{(2)}$