

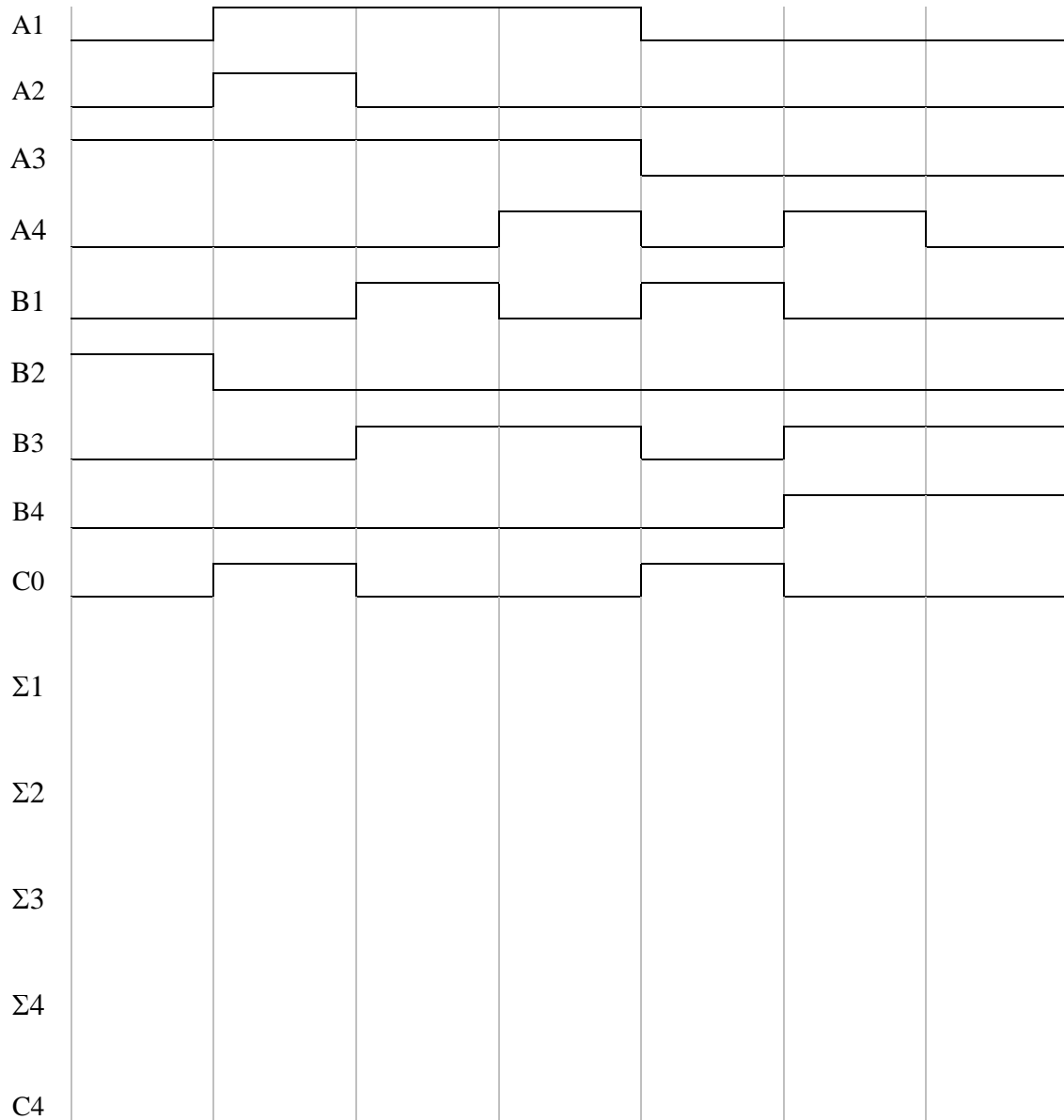
1. Perform these additions of binary numbers.

$$\begin{array}{r} 0111 \\ + \quad 1 \\ \hline \end{array}$$

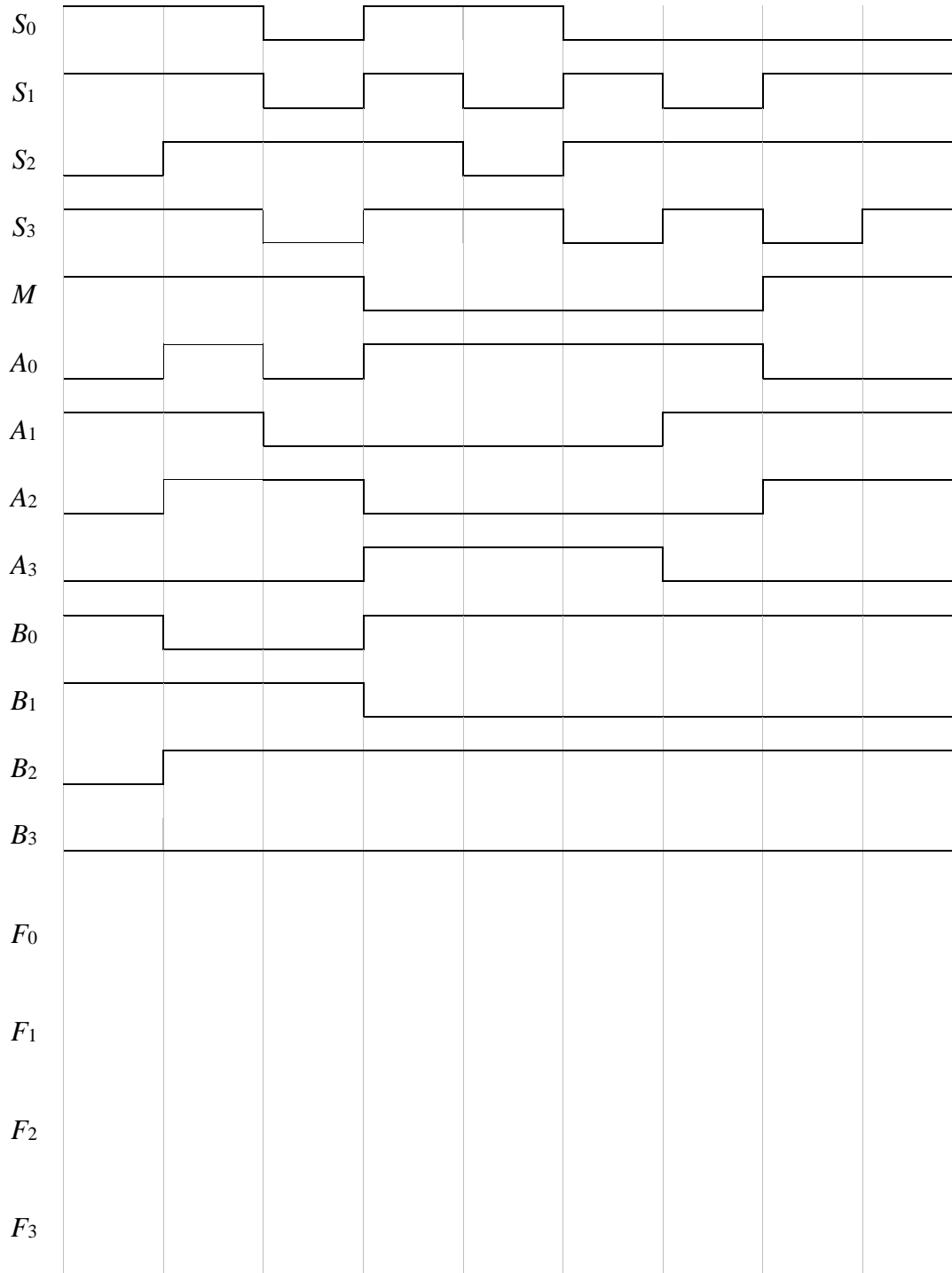
$$\begin{array}{r} 1001 \\ + 1011 \\ \hline \end{array}$$

$$\begin{array}{r} 10110 \\ + \quad 111 \\ \hline \end{array}$$

2. Draw the output waveforms given the inputs shown below to a 74283 adder.



3. Draw the output waveforms for a 74181 arithmetic logic unit. Assume \overline{C}_n is a constant HIGH.



4. What is the one's-complement of 0011 0101₂? _____
5. What is the two's-complement of 0011 0101₂? _____
6. In the table below, list all **unsigned** binary four-bit integers in increasing order, and convert each one to decimal.

Binary	Decimal

7. What range of unsigned integers can we represent using 16 bits?

8. What range of unsigned integers can we represent using 32 bits?

9. In the table below, list all **signed** binary four-bit integers in increasing order, and convert each one to decimal.

Binary	Decimal

10. What range of signed integers can we represent using 16 bits?

11. What range of signed integers can we represent using 32 bits?

Converting from Decimal to Two's-Complement Form:

12. Convert 23_{10} to two's complement form using 8 bits. _____

13. Convert -23_{10} to two's complement form using 8 bits. _____

14. Convert 58_{10} to two's complement form using 8 bits. _____

15. Convert -58_{10} to two's complement form using 8 bits. _____

Converting from Two's-Complement Form to Decimal:

16. Convert $0110\ 0010_2$ from two's complement form to decimal. _____

17. Convert $1110\ 0010_2$ from two's complement form to decimal. _____

18. Convert $0001\ 1010_2$ from two's complement form to decimal. _____

19. Convert $1011\ 1010_2$ from two's complement form to decimal. _____