Operating Systems

Let $N$ be the 16-bit value 1001 0101 0000 0000$_2$.

(a) What is the value of $N$ when interpreted as:

(i) An unsigned integer? [1 mark]

(ii) A sign-and-magnitude format integer? [1 mark]

(iii) A 2’s complement integer? [2 marks]

(iv) A floating-point number with a 5-bit bias-15 exponent and a normalised mantissa? [State any assumptions you make.] [4 marks]

(b) Imagine $N$ has been loaded into the 16-bit register $r1$. Explain what the values of the $C$ (carry) and $V$ (overflow) flags would be after the CPU executes the instruction $\text{add } r0 \leftarrow r1, r1$. [2 marks]