

Question NO 1:

If we have 7-bit memory location, then tell

- i) How many unsigned numbers it can represent?

$$\text{Answer: } 2^n = 2^7$$

- ii) How many signed numbers it can represent?

$$\text{Answer: } 2^n = 2^7$$

- iii) What would be the range for unsigned numbers?

Range for unsigned:

$$0, \dots, 2^n - 1$$

- iv) What would be the range in case of signed numbers?

$$-2^{(n-1)}, \dots, 0, \dots, 2^{n-1} - 1$$

- v) Specify the minimum and maximum value in case of unsigned numbers?

$$\text{Minimum} = 0 \ \& \ \text{maximum} = 2^n - 1 = 2^7 - 1$$

- vi) Specify the minimum and maximum in case of signed numbers?

$$\text{minimum} = -2^{n-1} = 2^{7-1} = -2^6$$

$$\text{maximum} = +2^{n-1} - 1 = 2^{7-1} - 1 = +2^6 - 1$$