**Problem 7.8:** Given in Figure 7.30, an ANN with linearly activated neurons, i.e., the output *y*, is a weighted summation of its input signals y = , where *wi* is the weight of input signal *xi* to that neuron. The numbers at the input arrows at neurons n1 and n2 are the input signals. The numbers at the edges are weights applied on that edge. For example, the edge between n1 and n3 has a weight w13 = −1. Assume the weights on two input edges are equal to 1.

A close up of a logo

Description automatically generated

**Figure 7.30**

An ANN for Problem 7.8.

1. Calculate the input and output of all neurons (n3, n4, and n5) and the final output of output layer neurons (n6, n7) with respect to input signals (2, 4) to (n1, n2), respectively.
2. What is the output of the network if the input signals are changed to (1, 2) for (n1, n2), respectively? Do you have to repeat all the calculations in part(a)? Is there a shortcut to generate the final output in one step based the results obtained in part(a)?

No, the operations through the ANN is linear, so the result should be proportionally become half of the original outcome, which is (-4, 6).