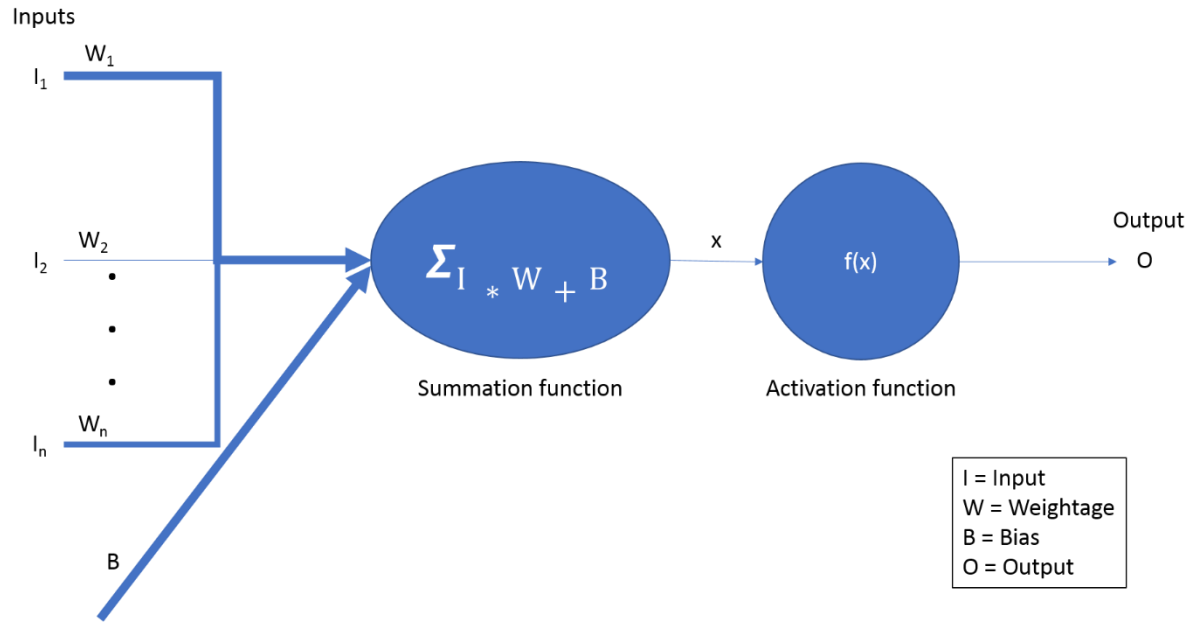
Answer the following questions:

1. Describe the basic components of a typical artificial neuron using a suitable diagram [10 marks]



An artificial neuron is comparable to a biological neuron as it is based on the concept of that of biological neuron. An artificial neuron takes in multiple inputs, multiplying with its respective weightage and add with a bias to get a value as the summation of the inputs. Then, that value is passed to the activation function to translate the value into output. For example, if the value is above 0.5, then output = 1. In short, the basic components of an artificial neuron are the input, weightage, bias, summation function, activation function and output.

2. Compare components of a biological neuron with those of an artificial neuron in a tabular format. [10marks]

Traits	**Biological Neuron**	**Artificial Neuron**
Speed	Few milliseconds	Few nanoseconds
Size and complexity	Bigger and more complex	Depends on designer, generally simpler and less complex
Memory storage	Synapse	Weightage
Fault tolerance	Yes	No
Control mechanism	Complex, involve hormones and chemical reactions	Simpler, involve mathematical formulae
Application	Can do multiple tasks	Highly specialized to do a specific task, Eg. Can be expert in chess, but fail at tic tac toe