

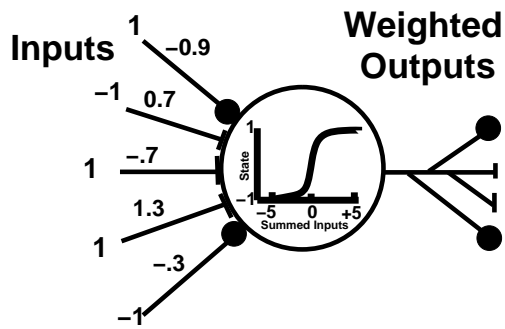
## Zoo400 Quiz 3: Mar 18, 1999

NAME:

---

There is only 1 best answer per question. (1 pt each)

1. Which of the following is not indicative of reduced activity [according to neurobiology/rate coding theory/slow potential theory.]
  - (A) hyperpolarization
  - (B) GLU (glutamate) transmitter release
  - (C) increase in interspike intervals (spike firing period)
  - (D) an inhibitory postsynaptic potential (IPSP)
  - (E) decrease in firing frequency
  
2. According to Cajal's dynamic polarization theory of the cell, information flows from
  - (A) axon to dendrite to soma
  - (B) soma to dendrite to soma
  - (C) soma to axon to dendrite
  - (D) dendrite to soma to axon
  - (E) dendrite to axon to soma
  
3. Which of the following neurobiological phenomena runs contrary to the standard dynamic polarization/rate coding/slow potential model of the cell.
  - (A) dendritic back-propagation
  - (B) dendritic domains
  - (C) dendrodendritic synapses
  - (D) cell bursting and irregular firing
  - (E) all of the above
  
4. A frequency of 8 Hz correspond to a interspike interval (firing period) of [BEWARE UNITS]
  - (A) 25 ms
  - (B) 100 ms
  - (C) 125 s
  - (D) 125 ms
  - (E) 100 s



5. The weight vector in the picture above is:
- (A) (-1 1 1 -1 1)
  - (B) (1 -1 1 1 -1)
  - (C) (-3 0.3 2.1 1.7 -0.5)
  - (D) (-3 1.7 2.1 0.3 -0.5)
  - (E) (-3 -1 0.3 1 2.1 1 1.7 -1 -0.5 1)
6. The total input to the neuron depicted above is
- (A) -3.2
  - (B) -2.8
  - (C) 3.2
  - (D) 2.8
  - (E) 6.6
7. The concept of slow potential theory is associated with each of the following EXCEPT:
- (A) rate coding
  - (B) potential duration that matches periods to be integrated
  - (C) cell bursting
  - (D) summation of postsynaptic potentials associated with incoming spikes
  - (E) integration of frequency information

8. According to rate coding theory, if neuron A has an excitatory projection to neuron B and neuron A increase its rate by a certain amount, neuron B would be expected to: [hint: assume a driven spontaneous rate]
- (A) increase its rate by the same amount
  - (B) decrease its rate by the same amount
  - (C) increase its rate still more than the neuron A increase
  - (D) increase its rate less than the neuron A increase
  - (E) decrease its rate less than the neuron A increase
9. the currently believed version of Dale's law states that
- (A) A single neuron does not project both excitatory and inhibitory (release both GLU and GABA).
  - (B) A single neuron does not receive both excitatory and inhibitory (have both GLU and GABA receptors).
  - (C) A neuron must fire bursts and not single spikes.
  - (D) Synaptic weights are all positive.
  - (E) Two neurons in series are required to make all connections in the nervous system.
10. In rate coding theory, a negative state value is transduced by
- (A) The spontaneous rate of firing
  - (B) Burst firing of the neuron
  - (C) An increase in rate of firing relative to spontaneous
  - (D) A decrease in interspike interval relative to spontaneous
  - (E) A decrease in rate of firing relative to spontaneous