

1. Describe in detail the sequence of events between a motor neuron action potential and skeletal-muscle fiber contraction. (15%)
2. Explain how electrical stimulation of the periaqueductal gray area in the upper brain stem suppresses pain signals entering the dorsal horn of the spinal cord. (20%)
3. Draw a flow diagram illustrating the factors that determine mean arterial blood pressure. (15%)
4. What happens to arterial  $PO_2$ ,  $PCO_2$ , and  $H^+$  concentration during moderate and severe exercise? (6%) List other factors that may stimulate ventilation during exercise. (9%)
5. Diagram the sequence of events by which diarrhea leads to a decreased glomerular filtration rate (GFR) in the kidney. (20%)
6. Describe and contrast the neural control of erection and ejaculation of the penis. (15%)