PART I: MULTIPLE CHOICE

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completions of the statement. Select the ONE lettered answer or completion that is BEST in each case.

41. Which of the following is true concerning muscle tissue:
   A. Myosin filaments in smooth and skeletal muscle are identical
   B. Endurance (slow oxidative) muscle is red in skeletal muscle, but white in cardiac muscle
   C. Dense bodies in smooth muscle are analogous to Z lines in striated muscle
   D. Cardiac myocytes secrete elastin, but smooth muscle cells do not
   E. Adult smooth muscle cells are incapable of mitosis

42. In an electron micrograph of a section through a peripheral nerve, you observe a structure that is enveloped by a Schwann cell, but no myelin is present. This enveloped structure is likely to be:
   A. A cleft of Schmidt-Lantermann
   B. A node of Ranvier
   C. A cell body of a sensory ganglion neuron
   D. An autonomic ganglion neuron
   E. An axon

43. In the diagram of a sarcomere shown above, the region indicated by the bracket labeled "X":
   A. Is the H band
   B. Is the bare zone
   C. Is the I band
   D. Remains constant in length when the sarcomere contracts
   E. Is cleaved by a Z line
44. Which of the following can stimulate smooth muscle to contract:
   A. Acetylcholine
   B. Oxytocin
   C. Norepinephrine
   D. Some of the peptides secreted by enteroendocrine cells in the GI tract
   E. All the above

45. Which of the following is a calcium-binding protein associated with the thin filaments of skeletal muscle:
   A. Calsequestrin
   B. Titin
   C. Calmodulin
   D. Troponin
   E. Tropomyosin
   F. C-protein

46. A syncytium is defined as:
   A. A group of cells united by gap junctions
   B. A group of cells united by desmosomes
   C. A multinucleated cell formed by the fusion of formerly separate cells
   D. A multinucleated protoplasmic mass formed by the fusion of formerly separate cells

47. Action potentials traveling toward the spinal cord in a peripheral nerve are likely to be carried by:
   A. Processes of sensory neurons
   B. Axons of motor neurons
   C. Axons of sympathetic ganglion neurons
   D. Axons of parasympathetic ganglion neurons
   E. Axons of pre-ganglionic neurons

**DIRECTIONS:** Each of the numbered items or incomplete statements in this section is negatively phrased, as indicated by a capitalized word such as INCORRECT, FALSE, or EXCEPT. Select the ONE lettered answer or completion that is BEST in each case.

48. Which of the following is FALSE concerning intercalated discs:
   A. Intercalated discs are membrane junctions that unite cardiac muscle cells
   B. Intermediate filaments insert into the desmosomes of an intercalated disc
   C. Gap junctions are found mainly on the transverse portions of intercalated discs
   D. Actin filaments are anchored in the fascicles adherent to an intercalated disc
   E. An intercalated disc often follows an irregular, step-like course
40. Identify the FALSE statement regarding synaptic specializations of the skeletal muscle fiber:
   A. The muscle fiber membrane is depressed to form a shallow gutter
   B. Acetylcholine receptors are abundant at the crests of the junctional folds
   C. Muscle cell nuclei are abundant near a neuromuscular junction
   D. A basal lamina surrounds the Schwann cell, but is absent in the synaptic cleft
   E. Failed or reduced synaptic transmission causes progressive muscle atrophy

50. Identify the FALSE statement. In skeletal muscles:
   A. Sarcomeres shorten during contraction and become thicker
   B. Myofilaments remain the same length during muscle contraction
   C. The terminal cisternae release calcium into the cytosol as a result of depolarization of the sarcolemma and T tubule membranes
   D. The role of calcium is to stimulate a myosin light-chain kinase that phosphorylates myosin
   E. A motor unit consists of a single neuron and all the muscle cells it innervates

51. Identify the FALSE statement regarding motor nerve endings at the neuromuscular junction in skeletal muscle:
   A. Motor nerve terminals are myelinated by Schwann cells
   B. Acetylcholine is released by the nerve terminal
   C. Active zones are aligned to junctional folds of the muscle membrane
   D. A single muscle fiber is innervated by only one axon in the adult
   E. Microtubules and neurofilaments are rarely present within the nerve terminal

52. Identify the FALSE statement regarding a muscle spindle:
   A. It consists of sensory neurons interwoven among collagen fibers
   B. It is activated by muscle stretch
   C. The central region of the muscle spindle is enriched with nuclei
   D. It is innervated by both afferent and efferent neurons
   E. Afferent nerve endings wrap around the central region of the muscle spindle

53. Identify the FALSE statement concerning smooth muscle:
   A. Smooth muscle cells are often joined to one another by gap junctions
   B. When the cell is contracted, the nucleus often has a corkscrew appearance in longitudinal section
   C. At the neuromuscular junction, the smooth muscle cell membrane has many deep junctional folds
   D. The arrector pili muscles associated with hair follicles are composed of smooth muscle
PART II: MATCHING

DIRECTIONS: Each set of matching questions in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the ONE lettered option that is most closely associated with it. Each lettered option may be selected once, more than once, or not at all.

A. Meissner's corpuscles
B. Golgi tendon organs
C. Ruffini endings
D. Merkel's corpuscles
E. Pacinian corpuscles
F. Free nerve endings
G. Muscle spindles

54. __ Numerous in the epidermis of skin; not surrounded by a capsule; and mediate sensations such as pain and temperature.

55. __ Commonly found in the hypodermis, and are surrounded by inner and outer cores.

56. __ Encapsulated receptors found in the dermal papillae of glabrous skin.