Anatomy & Physiology of Domestic Animals: Exam 2

Section I – True/False (explain if false)

_____ Bone is classified as a connective tissue.

_____ The appendicular skeleton includes the skull and ribs.

_____ The periosteum covers the inner surface of bones.

_____ Synarthroses joints are freely movable.

_____ The sacroiliac joint connects the sacrum and ilium.

_____ Compact bone is less dense than spongy bone.

_____ The autonomic nervous system controls voluntary movement.

_____ Afferent pathways carry information away from the CNS.

_____ The sympathetic nervous system is responsible for the "fight or flight" response.

_____ Cardiac muscle contractions depend completely on nervous input.

_____ Do cows have a fibula?

Section II – Multiple Choice

Which type of joint allows free movement?
a) Synarthroses
b) Amphiarthroses
c) Diarthroses
d) Fibrous

Which of the following bones are part of the axial skeleton?
a) Femur, tibia, fibula
b) Skull, vertebral column, ribs
c) Scapula, humerus, ulna
d) Pelvis, femur, radius

Which bone cell is responsible for building bone?
a) Osteoclast
b) Osteocyte
c) Osteoblast
d) Osteoprogenitor

Which part of the long bone is the shaft?
a) Epiphysis
b) Diaphysis
c) Metaphysis
d) Medullary cavity

Which ossification process forms flat bones?
a) Endochondral
b) Intramembranous
c) Periosteal
d) Osteogenic

Which division of the nervous system consists of the brain and spinal cord?
a) CNS
b) PNS
c) Somatic
d) Autonomic

Which part of a neuron receives incoming information?
a) Axon
b) Dendrite
c) Myelin sheath
d) Axon terminal

Which of the following neurotransmitters stimulates skeletal muscle contraction?
a) Dopamine
b) Norepinephrine
c) Acetylcholine
d) Serotonin

Which ion initiates muscle contraction by binding to troponin?
a) Sodium
b) Potassium
c) Calcium
d) Chloride

Which connective tissue surrounds the entire muscle?
a) Endomysium
b) Perimysium
c) Epimysium
d) Sarcolemma

Which muscle type is involuntary and non-striated?
a) Skeletal
b) Smooth
c) Cardiac
d) Both b and c

Which of the following best describes the function of the nervous system?
a) Structure and protection
b) Regulation, integration, and response
c) Hormone production
d) Blood circulation

Which of the following is not part of the appendicular skeleton?
a) Scapula
b) Pelvis
c) Femur
d) Sternum

Which layer of the meninges lies closest to the brain and spinal cord?
a) Dura mater
b) Arachnoid
c) Pia mater
d) Neural cortex

Which of the following is a function of bone?
a) Conduction
b) Filtration
c) Protection
d) Reproduction

Section III – Matching

Match the term with its correct description:

A. Osteocyte
B. Myelin Sheath
C. Sympathetic Nervous System
D. Sarcomere
E. Compact Bone
F. Spongy Bone
G. Osteoblast
H. Cartilage
I. Synovial Joint
J. Reflex Arc

_____ Dense, strong bone forming the outer layer of bone

_____ Mature bone cell that maintains bone tissue

_____ Unit of muscle contraction

_____ Found in ends of long bones; contains red marrow

_____ Connective tissue providing smooth surface for movement

_____ Joint with fluid-filled cavity allowing free motion

_____ Rapid, automatic response to a stimulus

_____ Insulating layer that speeds nerve transmission

_____ Builds new bone tissue

_____ Controls “fight or flight” responses

Section IV – Short Answer

What are the six types of bones, and give an example of each.

Explain the steps of intramembranous ossification.

List and describe the three types of joints based on movement.

Describe the structure and function of the meninges.

Explain the difference between afferent and efferent pathways.

List three functions of the skeletal system.

Name the three muscle types and their functions.

What is the difference between the somatic and autonomic nervous systems?

Describe how the Z-line moves during muscle contraction.

Explain the difference between depolarization and repolarization in an action potential.

What are the types of bone marrow and their functions?

Define hypertrophy, hyperplasia, and atrophy.

What is cerebrospinal fluid and its purpose?

Describe how a neurotransmitter functions at a chemical synapse.

List the layers of connective tissue surrounding muscles from inner to outer.

Section V – Extended Response

Describe the difference between spongy bone and compact bone in structure and function.

What is the process of Intramembranous Ossification?

Explain the process of endochondral ossification in long bones.

Discuss how the skeletal, muscular, and nervous systems work together to create movement.

Trace the reflex arc pathway from stimulus to response, including all steps.

Explain the process of an action potential using sodium and potassium movement.

Compare and contrast the parasympathetic and sympathetic nervous systems, including physiological responses.

Discuss the importance of calcium and ATP in muscle contraction.

Describe the sliding filament theory of muscle contraction in detail.

There are four types of joint movements. What are the names of the movements and what direction/how are the limbs moving?

Describe the main differences and similarities between chemical and electrical synapses. Include their structure, speed, direction of signal transmission, and function in your answer.

Draw an Action Potential graph, including all the key components of the sodium potassium pump.