**STUDY GUIDE CARTILAGE AND BONE**

**(SKELETAL CONNECTIVE TISSUE)**

**VOCABULARY**

Chondroblast Chondrocyte Osteoblast

Osteocyte Hyaline cartilage Elastic cartilage

Fibrocartilage Articular surface Appositional growth

Interstitial growth Osteoclast Perichondrium

Osteon Osteoid Lacunae

Canaliculus Gap junction Periosteum

Endosteum Mesenchymal cell Collagen

Matrix Isogenous groups

**OBJECTIVES AND QUESTIONS**

1. What are the major properties and functions of cartilage? (Hint: embryonic model for bone, cushion, flexibility, etc.,)
2. What are the three major types of cartilage and where are they found?
3. What is one major characteristic feature of cartilage that it shared with epithelium? (Hint: avascular – note this is different from bone!)
4. What are the two types of ossification and how do they differ? (Hint: intramembranous is not proceeded by cartilage, the osteoblasts secrete matrix which is mineralized directly, and with endochrondrial cartilage is **replaced** by bone). Where is each type found? (Hint: intramembranous – flat bones, endochrondrial – long bones).
5. What are the major components of cartilage matrix? (Hint: type II collagen and sulfated proteoglycans – this gives it a blue color, sulfated proteoglycans missing in bone matrix, therefore pink due to collagen). Which cells secrete cartilage matrix? (Hint: chondroblasts). What about bone? (Hint: matrix is osteoid, a mixture of type I collagen and other stuff on which calcium phosphate AKA hydroxyapatite, is deposited, matrix is secreted by osteoblasts).
6. What are the major functions of bone? How does bone regulate blood calcium? (Hint: parathyroid hormone stimulates osteoclast activity, calcitonin inhibits it).
7. How do bones grow in width and in length? (Hint: width – appositional growth of bone, length – interstitial growth of hyaline cartilage in epiphyseal plate followed by endochrondrial ossification; note hyaline cartilage is found in the primary spongiosa, osteoid in secondary spongiosa). How do cartilage and bone differ in their ability for interstitial and appositional growth? (Hint: bone is appositional only.
8. How do osteocytes get their nutrients? (Hint: through gap junctions with other osteocytes via cytoplasmic extensions in canaliculi). What about chondrocytes? (Hint: diffusion through matrix).