Bio 121 **TEST 4** Fall 2010

**SELECT THE ONE MOST CORRECT ANSWER TO THE QUESTION AND PLACE THE ANSWER IN THE CORRECT SPACE ON THE ANSWER SHEET.**

1. Nourishment for osteocytes in spongy bone is provided by **MPO 2.2**
   1. Blood in vessels in the red marrow
   2. Blood in vessels in central canals
   3. Blood in yellow marrow
   4. Blood in canaliculi
2. Lacunae are **MPO 2.2**
   1. Channels for blood vessels and nerves extending through dense bone
   2. Rings of matrix in osteons
   3. Spaces in matrix in which osteocytes and chondrocytes are located
   4. Specialized junctions between osteocytes
3. The function of calcitonin is to **MPO 3.3**
   1. Lower the level of calcium ions in the blood
   2. Raise the level of calcium ions in the blood
   3. Activate osteoclasts
   4. Force osteoblasts to differentiate into osteoclasts
4. Which of the following statements concerning bone classification is most **CORRECT**?
   1. Long bones have a shaft and two ends and do not contain spongy bone **MPO 2.2**
   2. Short bones are constructed like long bones, but are shorter in length
   3. Flat bones such as those in the skull are formed entirely of compact bone
   4. Irregular bones have complicated shapes
5. During endochondral bone formation, the primary center of ossification forms in the
   1. Proximal epiphysis **MPO 2.2**
   2. Distal epiphysis
   3. Epiphyseal plate
   4. Diaphysis
6. Bone constantly remodels and redistributes its matrix along lines of **MPO 3.3**
   1. Blood flow
   2. Nervous stimulation
   3. Canaliculi
   4. Mechanical stress
7. Spongy bones are made up of a framework called **MPO 2.2**
   1. osteons
   2. trabeculae
   3. lamellar bone
   4. osseous lamellae
8. Rings composed of hard, calcified matrix surrounding the central canals are known as
   1. Canaliculi **MPO 2.2**
   2. Lacunae
   3. Concentric lamellae
   4. Trabeculae
9. The process of bones increasing in width is known as **MPO 2.2**
   1. Appositional growth
   2. Closing of the epiphyseal plate
   3. Long bones reaching adult length and width

d. Concentric growth

1. Yellow bone marrow contains a large percentage of **MPO 2.2**
   1. Fat
   2. Blood forming cells
   3. Elastic tissue
   4. Bile
2. Normal bone formation and growth are dependent on the adequate intake of **MPO 3.3**
   1. Sodium, calcium, and vitamin E
   2. Potassium, phosphate, and vitamin D
   3. Calcium, phosphate, and vitamin D
   4. Vitamin D, phosphate, and chloride
3. A canaliculus of compact bone contains **MPO 2.2**
   1. Nerves
   2. Blood vessels
   3. An abundance of collagen fibers
   4. A process of an osteocyte
4. What structure allows the diaphysis of the bone to increase in length? **MPO 2.2**
   1. Lacunae
   2. Epiphyseal plate
   3. Collagen
   4. Trabeculae
5. Most bones of the extremities are **MPO 2.2**
   1. Flat bones
   2. Spongy bones
   3. Long bones
   4. Irregular bones
6. The canal that runs through the core of each osteon (the Haversian canal) is the site of
   1. Cartilage and interstitial lamellae **MPO 2.2**
   2. Osteoclasts and osteoblasts
   3. Yellow marrow and spicules
   4. Blood vessels and nerves
7. Which of the following cells accomplishes bone resorption (breakdown)? **MPO 3.3**
   1. osteoclast
   2. osteocyte
   3. chondrocyte
   4. stem cell
8. An articular cartilage covers the \_\_\_\_\_ of a bone. **MPO 2.2**
   1. Diaphysis
   2. Epiphysis
   3. Metaphysis
   4. Nutrient foramen
9. The most abundant skeletal cartilage type is **MPO 2.2**
   1. elastic
   2. fibrocartilage
   3. epiphyseal
   4. hyaline
10. In some cases the epiphyseal plate of the long bones ossifies too early. What might be the cause? **MPO 3.3**
    1. Overproduction of thyroid hormone
    2. Elevated levels of sex hormones
    3. Too much vitamin D in the diet
    4. Osteoblast activity exceeds osteoclast activity
11. Hemopoiesis typically occurs in **MPO 2.2**
    1. The epiphyseal plate
    2. The articular cartilages
    3. The red bone marrow
    4. The yellow marrow
12. All of the following components of the bone matrix are organic except **MPO 2.2**
    1. Hydroxyapatite
    2. Collagen
    3. Chondroitin sulfate
    4. Proteoglycans
13. \_\_\_ is always surrounded by \_\_\_. **MPO 2.2**
    1. Compact bone … cartilage
    2. Compact bone … spongy bone
    3. Spongy bone … compact bone
    4. A diaphysis … an epiphysis
14. A/an \_\_\_\_\_ covers most parts of a bone except for its articular cartilage. **MPO 2.2**
    1. Tendon
    2. Diploe
    3. Epicondyle
    4. Periosteum
15. The protein fibers of the bone matrix are composed of **MPO 2.2**
    1. Collagen
    2. Elastin
    3. Keratin
    4. Fibrin

**(25–28).** Match the fracture to its definition. **MPO 3.3**

a. comminuted c. transverse e. spiral

b. compound d. greenstick f. oblique

1. An incomplete fracture or cracking of the bone without actual separation of the parts. Common in children.
2. A bone break at right angles to the long axis.
3. Bone fragments into many pieces.
4. Bone breaks from twisting forces; a common sports fracture
5. A soft callus forms during **MPO 3.3**
   1. Endochondral ossification
   2. Intramembranous ossification
   3. The remodeling of bone
   4. The healing of a fracture
6. The skeletal system performs all of the following functions except **MPO 3.3**
   1. Protective enclosure of the viscera
   2. Maintenance of electrolyte balance
   3. Regulation of body temperature
   4. Production of blood cells
7. The main reason osteoporosis is most common in elderly women is their lack of **MPO 3.3**
   1. estrogen
   2. osteoclast activity
   3. thyroid hormone
   4. dietary calcium
8. The universal loss of mass seen in the skeleton, which begins about the age of 40: **MPO 3.3**
   1. Is slower in females than in males
   2. Is absolutely uniform throughout the skeleton
   3. Reflects an imbalance in the bone remodeling process
   4. Is greater in African Americans than in Northern Europeans
9. Which hormone increases osteoclast activity to release more Ca2+ into the bloodstream?
   1. Calcitonin **MPO 3.3**
   2. thyroxine
   3. parathyroid hormone
   4. estrogen
10. In the epiphyseal plate, cartilage grows **MPO 2.2**
    1. From the diaphysis to the epiphysis
    2. From the epiphysis to the diaphysis
    3. From the edges inward
    4. In a circular fashion
11. For intramembranous ossification to take place, which of the following is necessary?
    1. A bone collar forms around the cartilage model **MPO 2.2**
    2. An ossification center forms in the fibrous connective tissue
    3. The cartilage matrix begins to deteriorate
    4. A medullary cavity forms

**(36 – 38).** Name the disease described by each statement. **MPO 3.3**

1. Bones are porous and thin but bone composition is normal.
2. Bone formed is poorly mineralized and soft. Deforms on weight-bearing.
3. Abnormal bone formation and reabsorption.
4. Observe the bones in the picture below. Which one is the normal bone? **MPO 3.3**
5. Observe the bones in the pictures below. Which one is the adult hand? **MPO 3.3**

**(41 – 50).** Select the structure from column A that matches the statement in column B.

**A B**

1. Clavicle a. shoulder blade
2. Femur b. collar bone
3. Fibula c. shinbone
4. Humerus d. kneecap
5. Os coxa e. upper arm bone
6. Patella f. thigh bone
7. Radius g. lateral bone of forearm
8. Scapula h. one half of pelvic girdle
9. Tibia i. medial bone of forearm
10. Ulna j. thin bone paralleling calf bone

Biology 121 – Test 4

Data obtained October 28, 2010

N = 31

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question #** | **MPO** | **# Correct** | **Percentage** | **Average for same MPO** |
| 1 | **2.2** | 18 | 58 |  |
| 2 | **2.2** | 21 | 68 |  |
| 3 | **3.3** | 12 | 39 |  |
| 4 | **2.2** | 30 | 97 |  |
| 5 | **2.2** | 25 | 81 |  |
| 6 | **2.2** | 20 | 65 |  |
| 7 | **2.2** | 25 | 81 | **73.1%** |
| 8 | **2.2** | 20 | 65 | **68.2%** |
| 9 | **2.2** | 26 | 84 |  |
| 10 | **2.2** | 28 | 90 |  |
| 11 | **3.3** | 29 | 94 |  |
| 12 | **2.2** | 11 | 35 |  |
| 13 | **2.2** | 28 | 90 |  |
| 14 | **2.2** | 27 | 87 |  |
| 15 | **2.2** | 22 | 71 |  |
| 16 | **3.3** | 26 | 84 |  |
| 17 | **2.2** | 28 | 90 |  |
| 18 | **2.2** | 27 | 87 |  |
| 19 | **3.3** | 4 | 13 |  |
| 20 | **2.2** | 26 | 84 |  |
| 21 | **2.2** | 14 | 45 |  |
| 22 | **2.2** | 24 | 77 |  |
| 23 | **2.2** | 24 | 77 |  |
| 24 | **2.2** | 24 | 77 |  |
| 25 | **3.3** | 26 | 84 |  |
| 26 | **3.3** | 20 | 65 |  |
| 27 | **3.3** | 27 | 87 |  |
| 28 | **3.3** | 28 | 90 |  |
| 29 | **3.3** | 18 | 58 |  |
| 30 | **3.3** | 16 | 52 |  |
| 31 | **3.3** | 24 | 77 |  |
| 32 | **3.3** | 18 | 58 |  |
| 33 | **3.3** | 18 | 58 |  |
| 34 | **2.2** | 10 | 32 |  |
| 35 | **2.2** | 21 | 68 |  |
| 36 | **3.3** | 22 | 71 |  |
| 37 | **3.3** | 23 | 74 |  |
| 38 | **3.3** | 16 | 52 |  |
| 39 | **3.3** | 27 | 87 |  |
| 40 | **3.3** | 26 | 84 |  |