1. Bone marrow tissue is found in many bones throughout the human body in two forms. Correctly indicate the tissues matched to their locations and functions in an adult.
   a) Red marrow=diploe=hematopoiesis; Yellow marrow=diploe=nutrient storage
   b) Red marrow=diploe=hematopoiesis; Yellow marrow=diploe=nutrient storage
   c) Red marrow=diploe=hematopoiesis; Yellow marrow=all diaphyses=nutrient storage
   d) Red marrow=all diaphyses=nutrient storage; Yellow marrow=all diaphyses=hematopoiesis

2. “Bone tissue contains several cell populations” you explain to your lab partner. You also correctly described these cell populations to her. So, what was it that you told her regarding these cell populations?
   a) osteoclasts secrete matrix by laying down osteoid then hydroxyapatite; osteoblasts secrete acids and enzymes to break down matrix
   b) osteoblasts secrete matrix by laying down osteoid then hydroxyapatite; osteoclasts secrete acids and enzymes to break down matrix
   c) osteocytes secrete matrix by laying down osteoid then hydroxyapatite; osteoclasts secrete acids and enzymes to break down matrix
   d) osteoclasts secrete matrix by laying down osteoid then hydroxyapatite; osteocytes secrete acids and enzymes to break down matrix

3. It’s the year 2042, and because you were so inspired by your academic experience at PGCC, you’ve returned as a tutor for Anatomy and Physiology. A student comes to you frustrated, because they just don’t get osteogenesis and ossification. Please help them get their facts straight.
   a) “Flat bones form by endochondral ossification – first you get a bone collar of compact bone, then you get a medullary cavity and spongy bone. And oh yeah, this happens in the diaphysis first. But Long bones are different. In intramembranous ossification you get spongy bone first and compact last.”
   b) “Long bones form by endochondral ossification – first you get spongy bone and a medullary cavity, then you get a bone collar. And oh yeah, this happens in the diaphysis first. But flat bones are different. In intramembranous ossification you get spongy bone first and compact last.”
   c) “Long bones form by endochondral ossification – first you get a bone collar of compact bone, then you get a medullary cavity and spongy bone. And oh yeah, this happens in the diaphysis first. But flat bones are different. In intramembranous ossification you get spongy bone first and compact last.”
   d) “Flat bones form by endochondral ossification – first you get a bone collar of compact bone, then you get no cavities. And oh yeah, this happens in the epiphyses first. But flat bones are different. In extramembranous remodeling you get spongy bone first and compact last.”

4. Ms. Smith’s son broke is fibula 3 centimeters distal to the lesser trochanter. Therefore, this child broke fibula at the ___________.
   a) diaphysis  b) proximal epiphysis  c) distal epiphysis  d) medullary cavity

5. The sternum is classified as a ___________ bone, while the scapula are examples of ________________ bones.
   a) appendicular, axial  b) axial, pectoral  c) pelvic, pectoral  d) axial, appendicular

6. Why are women at increased risk of osteoporosis after menopause?
   a) decreased estrogen results in increased osteoblast activity
   b) increased estrogen results in increased osteoclast activity
   c) decreased estrogen results in increased osteoclast activity
   d) increased estrogen results in increased osteoblast activity

7. Everyone knows that bones grow in multiple ways. Which way explains your increased height from childhood to puberty?
   a) growth hormone stimulated appositional growth of chondroblasts at the epiphyseal plate
   b) growth hormone stimulated interlamellar growth of chondrocytes at the epiphyseal plate
   c) growth hormone stimulated interstitial growth of chondroblasts at the epiphyseal line
   d) growth hormone stimulated interstitial growth of chondroblasts at the epiphyseal plate
8. After Ms. Smith’s son’s broken fibula was set, it eventually healed correctly. Which steps must that bone have gone through to heal correctly?

a) a hematoma formed within periosteum, a fibrocartilaginous callus formed within the clot, the callus was replaced with a bony callus, the structure remodeled
b) a hematoma formed within endosteum, a fibrocartilaginous callus formed within the clot, the callus was replaced with a bony callus, the structure remodeled
c) a blood clot formed within osteogenic layer, a hyaline cartilage callus formed within the clot, the callus was replaced with a bony callus, the structure remodeled
d) a blood clot formed within the periosteum, a hyaline cartilage callus formed within the clot, the callus was replaced with a bony callus, the structure remodeled

9. Osseous tissue viewed under the microscope contains many structures. Which one allows osteocytes to exchange cytoplasm?

a) central canal **(Correct)**  b) perforating canal  c) canaliculi  d) sharpey’s fibers

10. Now that you are an orthopedic surgeon, you view X-Rays daily. In fact, you are looking at one right now! Based on what you see, you’ve determined that the patient’s set fracture is just starting to heal. What are you seeing that gives you this information?

a) cartilaginous fronts are present  b) hydroxyapatite seams are present

c) calcification fronts are present  d) osteoid seams are present

11. Mr. Smith was totally surprised to find out that teeth articulate. In fact, they are classified as ______________.

a) cartilaginous, gomphoses, diarthroses  b) fibrous, gomphoses, amphiarthroses

c) cartilaginous, synchondroses, amphiarthroses  d) fibrous, synchondroses, amphiarthroses

12. The presence of a fluid filled cavity, articular cartilage, membrane and ligaments are characteristics of what type of joint?

a) hinge  b) suture  c) symphysis  d) synchondrosis

13. What does synchondroses describe?

a) a cartilaginous joint, example is epiphyseal plate  b) a fibrous joint, example is sacroiliac joint
c) a synovial joint, example is temporomandibular joint  d) this term describes range of motion and is not a joint

14. If you stand on your toes, what action is your foot performing?

a) plantar flexion  b) inversion  c) dorsiflexion  d) eversion

15. Turning your head ‘no’ is __________ but nodding your head ‘yes’ is __________.

a) abduction; circumduction  b) circumduction; rotation

c) flexion/extension; pronation  d) rotation; flexion/extension

16. The ______ are part of the Central Nervous System, but the ______ are part of the Peripheral Nervous System.

a) brain and spinal cord; cranial and spinal nerves  b) brain and cranial nerves; spinal cord and spinal nerves

c) cranial tracts and motor nerves; sensory receptors  d) spinal nerves and tracts; sensory and motor neurons

17. The motor division of the Peripheral Nervous System has two pathways. Which effector is correctly paired to the pathway?

a) cardiac muscle – somatic  b) skeletal muscle – autonomic  c) skeletal muscle - somatic

18. The sympathetic and parasympathetic are subdivisions of the __________.

a) Voluntary nervous system  b) Autonomic nervous system

c) Central nervous system  d) Somatic nervous system
19. Place the following items in order from simple to most complex.
1. Sodium  2. voltage gated channel  3. axolemma  4. action potential  5. axon
a) 1.2.3.5.4.   b) 5.3.1.2.4.   c) 2.3.1.5.4.   d) 5.4.3.2.1.

The Key

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C</td>
<td>11</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>B</td>
<td>12</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>C</td>
<td>13</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>A</td>
<td>14</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>D</td>
<td>15</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>C</td>
<td>16</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>D</td>
<td>17</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>A</td>
<td>18</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>C</td>
<td>19</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>