MULTIPLE CHOICE.—For the following multiple choice questions circle the letter in front of the response that best answers the question or completes the sentence. (20%, 2% each)

1. Which of the following is derived from endoderm?
   a. dermis of skin
   b. epidermis of skin
   c. melanocytes (pigment cells)
   d. spinal cord
   e. None of the above.

2. Which of the following is derived from mesoderm?
   a. dermis of skin
   b. epidermis of skin
   c. melanocytes (pigment cells)
   d. spinal cord
   e. None of the above.

3. During which of the following developmental processes are neural crest cells formed? (Technically they form immediately as this process completes.)
   a. cleavage
   b. fertilization
   c. formation of blastula
   d. gastrulation
   e. neurulation

4. Which of the following human blood vessels brings blood to the brain?
   a. common carotid
   b. common iliac
   c. inferior vena cava
   d. internal jugular
   e. external jugular
   f. superior vena cava

5. Which of the following is the type of cells depicted below?
   ![Cell Image]
   a. cardiac muscle cells
   b. ependymal cells
   c. neurons
   d. skeletal muscle cells
   e. Schwann cells
   f. smooth muscle cells

6. Which of the following human muscles is found in the neck?
   a. biceps brachii
   b. latissimus dorsi
   c. masseter
   d. sternocleidomastoid
   e. vastus intermedius

7. Which of the following is a gnathostome?
   a. hagfish
   b. lamprey
   c. lancelet
   d. sea squirt
   e. shark

8. Which of the following taxonomic groups includes humans?
   a. Actinopterygii
   b. Amniota
   c. Archosauria
   d. Cephalochordata
   e. Chondrichthys

9. Which of the following human body cavities contains the pancreas?
   a. abdominal
   b. mediastinal
   c. pelvic
   d. pericardial
   e. thoracic
   f. None of the above.

10. Give a common name for this organism and two “lower” (less inclusive) taxonomic groups to which it belongs.
   ![Chicken Image]
**Fill-in-the-Blank/Label.**—For the following exercises write the appropriate word or words in the available space. (10%)

1. Label the following on the diagram below: **carpels, clavicle, femur, humerus, iliac region, sacrum, sternum, tibia.** (4%)

2. Correctly label the two drawings below with the anatomical terms: **anterior, dorsal, inferior, lateral, posterior, superior.** (6%)

**Definitions.**—For the following words or phrases define them as accurately and concisely as possible. (20%, 4% each)

1. Basal lamina:

2. Homology:

3. **Primary** Neurulation:

4. Squamous cell:

5. Vertebra (plural = vertebrae):
1. a.) Fill in the following table for the indicated connective tissues. (5%)

<table>
<thead>
<tr>
<th>Connective Tissue</th>
<th>Cells (name)</th>
<th>Fiber(s) (if present)</th>
<th>Ground Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areolar Connective Tissue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dense Regular Connective Tissue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hyaline Cartilage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elastic Cartilage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bone</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b.) In the space below briefly explain why bone is as durable, resilient and quick healing as it is.

   Hint: Referencing something or some things in the table might be useful. (3%)

2. Compare the early development of an amphibian, a reptile (e.g., a chicken), a monotreme, and a eutherian to the completion of the first formation of the central nervous system. Be certain to

   a. name each major stage of development and indicate what happens and

   b. identify any significant differences among these organisms in what occurs at each stage.

   (It is strongly recommended that you use a table or lined up labeled sketches for your answer.) (16%)
3. SKETCH a generalized (simplified) cross section of the “abdominal region” of an early human embryo (this would be very similar in almost any vertebrate) after the first formation of the central nervous system. Label all the major structures, paying particular attention to labeling to the different types and subtypes of mesoderm. (14%)

4. Generally SKETCH the basic structure of a lamprey larva and label all the important structures. Then identify the developmental origin of each labeled structure as specifically as possible. (12%)