Using Figure 5.1, identify the following:

1) Spongy bone is indicated by letter __________.
   Answer: A
   Diff: 1       Page Ref: 135–137

2) The area that causes the lengthwise growth of a long bone is indicated by letter __________.
   Answer: E
   Diff: 2       Page Ref: 135–137

3) The area that serves as a storage area for fat in adults is indicated by letter __________.
   Answer: H
   Diff: 2       Page Ref: 135–137

4) The diaphysis is indicated by letter __________.
   Answer: C
   Diff: 2       Page Ref: 135–137

5) The distal epiphysis is indicated by letter __________.
   Answer: I
   Diff: 2       Page Ref: 135–137
6) The area that contains glassy hyaline cartilage that provides a smooth slippery surface which decreases friction is indicated by letter __________.
   Answer: D
   Diff: 2   Page Ref: 135–137

Fill in the blank or provide a short answer:
7) Blood cell formation is called __________.
   Answer: hematopoiesis
   Diff: 1   Page Ref: 135

8) __________ are giant cells that destroy bone.
   Answer: Osteoclasts
   Diff: 1   Page Ref: 140

9) Cube-shaped bones that contain mostly spongy bone are called __________ bones.
   Answer: short
   Diff: 1   Page Ref: 135

10) The disease in children whose diets lack calcium or vitamin D, where the bones fail to calcify, is called __________.
    Answer: rickets
    Diff: 1   Page Ref: 142

11) A round or oval hole through a bone, which contains blood vessels and/or nerves, is called a __________.
    Answer: foramen
    Diff: 1   Page Ref: 138

12) A large rounded projection on a bone is called a __________.
    Answer: tuberosity
    Diff: 1   Page Ref: 138

13) A fracture where the bone breaks cleanly but does not penetrate the skin is termed a __________ fracture.
    Answer: simple or closed
    Diff: 1   Page Ref: 142

14) An increase in bone diameter is called __________ growth.
    Answer: appositional
    Diff: 1   Page Ref: 140

15) The only freely movable bone in the skull is the __________.
    Answer: mandible
    Diff: 2   Page Ref: 149

16) The part of the ethmoid bone that contains holey areas with fibers that carry impulses from the olfactory receptors of the nose to the brain is the __________.
    Answer: cribriform plate
    Diff: 2   Page Ref: 148
17) The external acoustic (auditory) meatus is found on the _________ bone.
   Answer: temporal
   Diff: 2       Page Ref: 145

18) The heel bone is called the _________.
   Answer: calcaneus
   Diff: 1       Page Ref: 166

19) The head of the humerus fits into the _________ of the scapula.
   Answer: glenoid cavity
   Diff: 2       Page Ref: 160

20) The disease in which uric acid accumulates in the blood and may be deposited as needle-shaped crystals in the soft tissues of joints is called _________.
   Answer: gout
   Diff: 1       Page Ref: 174

21) The elbow joint is an example of a _________ joint in which movement occurs in only one plane.
   Answer: hinge
   Diff: 1       Page Ref: 171
Using Figure 5.2, identify the following:

22) The frontal bone is indicated by letter _________.
   Answer: L
   Diff: 1   Page Ref: 145

23) The femur is indicated by letter _________.
   Answer: H
   Diff: 1   Page Ref: 144

24) The fibula is indicated by letter _________.
   Answer: X
   Diff: 1   Page Ref: 144

25) The sternum is indicated by letter _________.
   Answer: O
   Diff: 1   Page Ref: 144
26) The radius bone is indicated by letter _________.
   Answer: Q  
   Diff: 1   Page Ref: 144

27) The mandible is indicated by letter _________.
   Answer: N  
   Diff: 1   Page Ref: 149

28) The scapula is indicated by letter _________.
   Answer: D  
   Diff: 1   Page Ref: 144

29) The phalanges of the foot are indicated by letter _________.
   Answer: Z  
   Diff: 1   Page Ref: 144

30) The sacrum is indicated by letter _________.
   Answer: R  
   Diff: 1   Page Ref: 144

Multiple Choice

1) The most important minerals stored in bones are:
   A) calcium and iron
   B) sodium and phosphorus
   C) sodium and potassium
   D) calcium and phosphorus
   E) calcium and potassium
   Answer: D  
   Diff: 1   Page Ref: 135
2) The type of tissue shown in Figure 5.3 is found mostly in:
   A) articular cartilage
   B) yellow marrow
   C) the diaphysis
   D) the epiphysis
   E) short bones
   Answer: C
   Diff: 3  Page Ref: 137; 139

3) Which of the following groups of bones in the human body, categorized according to shape, is correct:
   A) wrist and ankle bones – long bones
   B) arm and leg bones – short bones
   C) skull bones – flat bones
   D) coxal bones – irregular bones
   E) cranium – sesamoid bones
   Answer: D
   Diff: 2  Page Ref: 135

4) Which of the following bone categories is composed of two layers of compact bone sandwiching a layer of spongy bone between them:
   A) compact bone
   B) irregular bone
   C) flat bone
   D) long bone
   E) sesamoid bone
   Answer: C
   Diff: 1  Page Ref: 135
5) The periosteum is secured to the underlying bone by dense connective tissue fibers called:
   A) Volkmann’s canals
   B) a bony matrix with hyaline cartilage
   C) Sharpey’s fibers
   D) endochondral bone
   E) articular cartilage
Answer: C
Diff: 1 Page Ref: 135

6) In adults, the function of the yellow marrow is to:
   A) store adipose tissue
   B) form blood cells
   C) store calcium and phosphorus
   D) cause lengthwise growth in long bones
   E) decrease friction at joint surfaces
Answer: A
Diff: 3 Page Ref: 136

7) The presence of an epiphyseal plate indicates that:
   A) bone is dead
   B) bone length is no longer increasing
   C) bone diameter is increasing
   D) bone diameter is decreasing
   E) bone length is increasing
Answer: E
Diff: 2 Page Ref: 136

8) Osteons are characteristic of _________.
   A) articular cartilage
   B) spongy bone
   C) compact bone
   D) yellow marrow
   E) Sharpey’s fibers
Answer: C
Diff: 3 Page Ref: 137, 139

9) The bone cells within lacunae receive nourishment from blood vessels through passageways called:
   A) Haversian canals
   B) perforating canals
   C) lamellae
   D) medullary cavities
   E) canaliculi
Answer: E
Diff: 1 Page Ref: 139
10) A shallow, basin-like depression in a bone often serving as an articular surface is a:
   A) sinus   
   B) meatus   
   C) fossa   
   D) foramen   
   E) groove
Answer: C
Diff: 1   Page Ref: 138

11) A round or oval opening through a bone is a:
   A) facet   
   B) fossa   
   C) foramen   
   D) fissure   
   E) trochanter
Answer: C
Diff: 1   Page Ref: 138

12) Which of these are bone-forming cells:
   A) osteocytes   
   B) canaliculi   
   C) osteoclasts   
   D) osteoblasts   
   E) lamellae
Answer: D
Diff: 2   Page Ref: 140

13) The canal that runs through the core of each osteon contains:
   A) cartilage and lamellae   
   B) osteoclasts and osteoblasts   
   C) yellow marrow and Sharpey’s fibers   
   D) blood vessels and nerve fibers   
   E) red marrow
Answer: D
Diff: 1   Page Ref: 139

14) The small cavities in bone tissue where osteocytes are found are called:
   A) lacunae   
   B) Volkmann’s canals   
   C) Haversian canals   
   D) trabeculae   
   E) lamellae
Answer: A
Diff: 1   Page Ref: 138–139
15) What kind of tissue is the forerunner of long bones in the embryo:
   A) elastic connective tissue
   B) dense fibrous connective tissue
   C) fibrocartilage
   D) hyaline cartilage
   E) loose fibrous connective tissue
   Answer: D  
   Diff: 1  Page Ref: 140

16) Which of the following is an example of a bone that forms from fibrous membranes:
   A) the parietal bone
   B) the radius
   C) the humerus
   D) the femur
   E) the tibia
   Answer: A  
   Diff: 3  Page Ref: 135; 145

17) The factor(s) that determine where bone matrix is to be remodeled is (are):
   A) sex hormones
   B) growth hormone
   C) stresses of gravity and muscle pull on the skeleton
   D) parathyroid hormone (PTH)
   E) calcium level of the blood
   Answer: C  
   Diff: 2  Page Ref: 140

18) There are four stages in the healing of a bone fracture. Which of the following best illustrates the sequence of these stages:
   1. bony callus formation  
   2. bone remodeling  
   3. fibrocartilage callus formation  
   4. hematoma formation
   A) 4, 3, 2, 1
   B) 4, 3, 1, 2
   C) 1, 2, 3, 4
   D) 1, 3, 4, 2
   E) 1, 3, 2, 4
   Answer: B  
   Diff: 2  Page Ref: 143

19) What type of cell does parathyroid hormone (PTH) activate:
   A) osteocyte
   B) osteoblast
   C) osteoclast
   D) periosteum
   E) lacunae
   Answer: C  
   Diff: 2  Page Ref: 140
20) A compound fracture can be described as when:
   A) the bone is crushed
   B) the broken bone ends are forced into each other
   C) the broken bone is exposed to the outside
   D) the bone is broken into many fragments
   E) adjacent bones fracture simultaneously
Answer: C
Diff: 2       Page Ref: 143

21) A bone fracture where the bone is broken into many fragments is a:
   A) compound fracture
   B) simple fracture
   C) comminuted fracture
   D) compression fracture
   E) greenstick fracture
Answer: C
Diff: 1       Page Ref: 142

22) A fracture that is common in children, whose bones have relatively more collagen in their
matrix and are more flexible than those of adults, is a(n):
   A) impacted fracture
   B) spiral fracture
   C) depressed fracture
   D) greenstick fracture
   E) open fracture
Answer: D
Diff: 2       Page Ref: 142

23) A fracture that is common in osteoporotic bones is a(n):
   A) impacted fracture
   B) compression fracture
   C) spiral fracture
   D) depressed fracture
   E) simple fracture
Answer: B
Diff: 2       Page Ref: 142

24) The axial skeleton contains:
   1. skull
   2. arms and legs
   3. ribs and sternum
   4. vertebrae
   5. pelvic girdles
   A) 1, 3, 4, 5
   B) 1, 3, 4
   C) 2, 5
   D) 2, 3, 4, 5
   E) 1, 2, 3, 5
Answer: B
Diff: 2       Page Ref: 145
25) The suture found between the parietal and temporal bone is the:
   A) squamous suture  
   B) lambdoid suture  
   C) sagittal suture  
   D) coronal suture  
   E) both the squamous suture and the sagittal suture  
   Answer: A  
   Diff: 2  Page Ref: 145

26) All of the following facial bones are paired except one. Which of the following is the unpaired facial bone:
   A) palatine  
   B) lacrimal  
   C) vomer  
   D) maxillae  
   E) zygomatic  
   Answer: C  
   Diff: 2  Page Ref: 145–149

27) The middle nasal conchae are part of the:
   A) maxillae  
   B) sphenoid bone  
   C) nasal bone  
   D) vomer bone  
   E) ethmoid bone  
   Answer: E  
   Diff: 2  Page Ref: 147–148

28) Which of these bones is NOT associated with the foot:
   A) talus  
   B) calcaneus  
   C) metatarsals  
   D) tarsals  
   E) metacarpals  
   Answer: E  
   Diff: 2  Page Ref: 165–166

29) The hyoid bone is unique because:
   A) it is the only bone of the body that does not directly articulate with any other bone  
   B) it has an unusual shape  
   C) it is covered with mucosa  
   D) it has no specific function  
   E) it largely consists of cartilage  
   Answer: A  
   Diff: 1  Page Ref: 149
30) The sella turcica is part of the ________ bone.
   A) parietal
   B) ethmoid
   C) sphenoid
   D) temporal
   E) frontal
   Answer: C  
   Diff: 2  Page Ref: 145

31) There are _________ vertebrae in the neck region.
   A) five thoracic
   B) seven lumbar
   C) seven cervical
   D) twelve thoracic
   E) five lumbar
   Answer: C  
   Diff: 2  Page Ref: 150

32) Transverse foramina are found in the:
   A) sacrum
   B) coccyx
   C) thoracic vertebrae
   D) lumbar vertebrae
   E) cervical vertebrae
   Answer: E  
   Diff: 3  Page Ref: 155

33) The atlas is the:
   A) last lumbar vertebra
   B) first thoracic vertebra
   C) part of the sacrum
   D) second cervical vertebra
   E) first cervical vertebra
   Answer: E  
   Diff: 1  Page Ref: 155

34) Which is the correct order of ribs, from superior to inferior:
   A) floating ribs, true ribs, false ribs
   B) floating ribs, false ribs, true ribs
   C) true ribs, false ribs, floating ribs
   D) true ribs, floating ribs, false ribs
   E) false ribs, floating ribs, true ribs
   Answer: C  
   Diff: 2  Page Ref: 157-158
35) The sternum is the result of fusion of three bones called the:
   A) ischium, ilium, coccyx
   B) pubis, ischium, ilium
   C) manubrium, body, xiphoid process
   D) jugular notch, sternal angle, xiphisternal joint
   E) true ribs, manubrium, xiphoid process
   Answer: C
   Diff: 3 Page Ref: 157

36) The greater trochanter is located on the:
   A) radius
   B) humerus
   C) fibula
   D) tibia
   E) femur
   Answer: E
   Diff: 2 Page Ref: 164

37) The tailbone is the:
   A) ischium
   B) sacrum
   C) pubis
   D) coccyx
   E) patella
   Answer: D
   Diff: 1 Page Ref: 157

38) Which of the following is correct of the female pelvis when comparing it with the male pelvis:
   A) the angle of the female pubic arch is smaller
   B) the distance between the female ischial spines is greater
   C) the distance between the female ischial tuberosities is less
   D) the female iliac bones are less flared
   E) the female pelvis as a whole is deeper, and the bones are heavier and thicker
   Answer: B
   Diff: 3 Page Ref: 164
39) The type of joint shown in Figure 5.4 is:
   A) a suture
   B) a fibrous joint
   C) an amphiarthrotic joint
   D) a cartilaginous joint
   E) a synovial joint
   Answer: E
   Diff: 3 Page Ref: 170-171

40) A structure found on the femur is the:
   A) anterior crest
   B) trochlea
   C) lateral malleolus
   D) intercondylar fossa
   E) medial malleolus
   Answer: D
   Diff: 3 Page Ref: 164

41) Articulations permitting only slight degrees of movement are __________, whereas articulations permitting no movement are called __________.
   A) amphiarthroses; synarthroses
   B) synarthroses; amphiarthroses
   C) diarthroses; amphiarthroses
   D) amphiarthroses; diarthroses
   E) diarthroses; synarthroses
   Answer: A
   Diff: 2 Page Ref: 166; 168-170
42) Fingers and toes are referred to as:
   A) tarsals
   B) metacarpals
   C) phalanges
   D) metatarsals
   E) carpals
   Answer: C
   Diff: 2 Page Ref: 162; 166

43) Which of these bones is NOT a long bone found in the leg:
   A) femur
   B) patella
   C) fibula
   D) metatarsals
   E) tibia
   Answer: B
   Diff: 2 Page Ref: 164–166

44) Four of the five answers listed below are parts of the same anatomical area. Select the exception.
   A) humerus
   B) radius
   C) scapula
   D) fibula
   E) clavicle
   Answer: D
   Diff: 2 Page Ref: 158–161

45) Bone formation can be referred to as:
   A) osteoporosis
   B) rickets
   C) ossification
   D) gout
   E) osteoarthritis
   Answer: C
   Diff: 2 Page Ref: 140

True/False

1) Hematopoiesis refers to the formation of blood cells within the red marrow cavities of certain bones.
   Answer: TRUE
   Diff: 1 Page Ref: 135

2) The diaphysis of a long bone is composed of spongy bone.
   Answer: FALSE
   Diff: 1 Page Ref: 135

3) All flat bones are formed from hyaline cartilage.
   Answer: FALSE
   Diff: 1 Page Ref: 135
4) Osteoblasts respond to the parathyroid hormone (PTH).
   Answer: FALSE
   Diff: 2 Page Ref: 140

5) The master gland of the body (pituitary gland) is housed in a saddlelike depression in the temporal bone called the sella turcica.
   Answer: FALSE
   Diff: 2 Page Ref: 145

6) Ribs numbered 11 and 12 are true ribs because they have no anterior attachments.
   Answer: FALSE
   Diff: 1 Page Ref: 158

7) The zygomatic bones form the cheekbones.
   Answer: TRUE
   Diff: 1 Page Ref: 149

8) The spinal cord passes through the body of each vertebra.
   Answer: FALSE
   Diff: 1 Page Ref: 155

9) Most of the stress on the vertebral column occurs on the sturdiest vertebrae in the sacral region.
   Answer: FALSE
   Diff: 2 Page Ref: 155

10) In anatomical position, the lateral lower leg bone is the fibula.
    Answer: TRUE
    Diff: 1 Page Ref: 165

11) There are seven cervical, twelve thoracic, and five lumbar vertebrae.
    Answer: TRUE
    Diff: 2 Page Ref: 155

12) Spinal curvatures that are present at birth are called primary curvatures (the cervical and lumbar curvatures) and those that develop later are secondary curvatures (the thoracic and sacral curvatures).
    Answer: FALSE
    Diff: 2 Page Ref: 151; 154

13) The heaviest, strongest bone in the body is the femur.
    Answer: TRUE
    Diff: 1 Page Ref: 164

14) Fontanels allow for growth of the brain.
    Answer: TRUE
    Diff: 1 Page Ref: 150
Matching

*Match the following:*

1) An incomplete fracture or cracking of the bone without actual separation of the parts (common in children)
   
   **Diff: 1**   **Page Ref: 142**
   
   A) comminuted

2) Fracture where bone fragments into many pieces
   
   **Diff: 1**   **Page Ref: 142**
   
   B) compression
   C) greenstick
   D) depressed
   E) impacted

3) Fracture in which broken bone ends are forced into each other
   
   **Diff: 1**   **Page Ref: 142**

4) Type of fracture in which bone is crushed
   
   **Diff: 1**   **Page Ref: 142**

5) Type of fracture in which the broken bone portion is pressed inward
   
   **Diff: 1**   **Page Ref: 142**

1) C   2) A   3) E   4) B   5) D
Match the following:

6) Cells that can dissolve the bony matrix  
   Diff: 1  Page Ref: 140  
   A) epiphyseal plate  
   B) canaliculi

7) Layers of calcification that are found in bone  
   Diff: 1  Page Ref: 139  
   C) Sharpey’s fibers  
   D) osteoblasts

8) Small channels that radiate through the matrix of bone  
   Diff: 1  Page Ref: 139  
   E) osteons  
   F) epiphyseal line

9) Cells that can build bony matrix  
   Diff: 2  Page Ref: 140  
   G) lacunae  
   H) lamellae

10) Area where bone growth takes place  
    Diff: 2  Page Ref: 136  
    I) osteocytes  
    J) osteoclasts

Match the following:

11) Wrist joint  
    Diff: 1  Page Ref: 170-17  
    A) hinge joint  
    B) ball-and-socket joint

12) Shoulder joint  
    Diff: 1  Page Ref: 171-172  
    C) plane joint

13) Elbow joint  
    Diff: 1  Page Ref: 171  
    D) pivot joint  
    E) saddle joint

14) Knuckle joints  
    Diff: 1  Page Ref: 171  
    F) condyloid joint

15) Joint between atlas and axis  
    Diff: 1  Page Ref: 171  
    G) condyloid joint

6) J  7) H  8) B  9) D  10) A

Match the following:

16) Patella
   Diff: 2 Page Ref: 135–136
   A) irregular bone
   B) flat bone

17) Femur
   Diff: 2 Page Ref: 135–136
   C) short and sesamoid bone

18) Carpals
   Diff: 2 Page Ref: 135–136
   D) short bone
   E) long bone

19) Ulna
   Diff: 2 Page Ref: 135–136

20) Atlas
   Diff: 2 Page Ref: 135–136

21) Sternum
   Diff: 2 Page Ref: 135–136

22) Fibula
   Diff: 2 Page Ref: 135–136

23) Coxal bone
   Diff: 2 Page Ref: 135–136

24) True ribs
   Diff: 2 Page Ref: 135–136

25) Parietal bones
   Diff: 2 Page Ref: 135–136


Essay

1) Explain the five functions of the skeletal system.
   Answer: 1. Support—the skeletal system forms the body’s internal structural framework. The bones of the legs act as pillars to support the body trunk when we stand, and the rib cage supports the thoracic wall.
   2. Movement—the skeletal muscles, attached to bones by tendons, use the bones as levers to move the body and its parts.
   3. Protection—bones, such as the skull, thorax, and pelvis, protect the enclosed soft body organs.
   4. Storage—fat is stored in the internal cavities of bones. Bones also serve as a storehouse for minerals, the most important being calcium and phosphorus.
   5. Hematopoiesis—blood cell formation occurs within the red marrow of certain bones.

Diff: 2 Page Ref: 134–135
2) List and discuss the structures of a long bone.
   Answer: 1. Diaphysis—the shaft of the long bone: a) it is made of compact bone; b) it is covered
   by a fibrous connective tissue membrane, the periosteum. The periosteum is securely
   held to the compact bone beneath by connective tissue fibers called perforating or
   Sharpey’s fibers; c) it contains a hollow cavity called the medullary cavity that stores
   adipose tissue as yellow marrow, and is the site of hematopoiesis (red blood cell
   formation) in infants when it contains red marrow.
   2. Epiphyses—somewhat rounded ends of the long bone: each epiphysis has an outer
   layer of compact bone covering an inner core of spongy bone. The external surface is
   covered by a layer of hyaline cartilage, instead of a periosteum, called articular
   cartilage. This provides for a smooth, gliding joint.
   3. Epiphyseal line/plate—the junction between the epiphyses and the diaphysis.
   During growth years is made of hyaline cartilage and is called the epiphyseal plate. It
   causes the lengthwise growth of the bone. By the end of puberty, long bones stop
   lengthening when the plate has been replaced by bone. It now appears as a thin bony
   ridge and is called the epiphyseal line.

Diff: 1  Page Ref: 135-136

3) List and explain the steps in the repair process of a simple fracture.
   Answer: Step 1 is hematoma formation. A hematoma, or bloodfilled swelling, forms when bone
   breaks and blood vessels rupture. Bone cells are deprived of nutrition and die.
   Step 2 is fibrocartilaginous callus formation. The site of damage experiences growth of
   new capillaries into the clotted blood and disposal of dead tissue by phagocytes.
   Connective tissue cells of various types form a mass of repair tissue called
   fibrocartilage callus. This fibrocartilage callus contains several elements: some
   cartilage matrix, some bony matrix, and collagen fibers. This fibrocartilage callus acts
   to splint the broken bone, closing the gap.
   Step 3 is bony callus formation. As more osteoblasts and osteoclasts migrate into the
   area and multiply, fibrocartilage is gradually replaced by a callus of spongy bone (the
   bony callus).
   Step 4 is bone remodeling. Over the next few months, bony callus is remodeled in
   response to the mechanical stresses placed on it, so that it forms a strong, permanent
   patch at the fracture site.

Diff: 2  Page Ref: 143

4) Discuss the two factors that cause bone remodeling throughout life.
   Answer: 1. Calcium levels in the bloodstream determine when bone is to be broken down.
   When calcium levels in the bloodstream drop below normal, the parathyroid glands
   produce and release parathyroid hormone (PTH) into the blood. PTH activates
   osteoclasts (giant bone-destroying cells in bone) to break down bone and release
   calcium into the blood. Conversely, when calcium levels in the bloodstream are too
   high, osteoblasts (bone-forming cells in bone) are activated and calcium is deposited
   in bone matrix as hard calcium salts.
   2. Stresses of muscle pull and gravity acting on the skeleton determine where bone
   matrix is to be broken down or formed so that the skeleton can remain strong for as
   long as possible. Long bones grow in length and in thickness as the body increases in
   size and as a result of the activity of bulky muscles. At these sites, osteoblasts (bone-
   forming cells) lay down new matrix and become trapped within it. Once they are
   trapped, they become osteocytes or true bone cells.

Diff: 3  Page Ref: 140
5) Define fontanel and discuss its functions. Identify the four fontanels in the infant and cite their locations.

Answer: Fontanels are fibrous membranes connecting the cranial bones of the infant skull. They serve two functions: they allow the fetal skull to be compressed slightly during childbirth and they allow the infant brain to grow during the later part of pregnancy and early infancy. The four fontanels are:

1. Anterior fontanel—this is the largest fontanel and is located between the parietal bones and the frontal bone. It is diamond-shaped.
2. Mastoid fontanel—superior to the posterior part of the temporal bone on a lateral view of the cranium.
3. Posterior fontanel—smaller, triangular fontanel located posteriorly on the lateral view of the cranium.
4. Sphenoidal fontanel—superior to the anterior part of the temporal bone on the lateral view of the cranium.

Diff: 3  Page Ref: 149-150

6) List some of the features of a female pelvis that make it different from a male pelvis.

Answer: The female pelvis:

- a. has a larger and more circular inlet.
- b. is shallower than the male pelvis.
- c. has lighter and thinner bones.
- d. has a shorter and less curved sacrum.
- e. has a more rounded pubic arch.
- f. has shorter ischial spines that are also farther apart.

Diff: 2  Page Ref: 164

7) If 6-year-old Sarah fell and broke her femur, damaging the proximal epiphyseal plate, what might she expect as she grows older? What is an epiphyseal plate and why is it significant to this situation?

Answer: The epiphyseal plate is a flat plate of hyaline cartilage seen in young growing bone. Epiphyseal plates cause the lengthwise growth of long bone. Since this child is still growing and has not completed puberty, she may expect impaired growth in that one epiphyseal plate. Lucky for Sarah, there is an epiphyseal plate located at both the distal and proximal ends of the femur. The healthy distal plate can continue to grow.

Diff: 3  Page Ref: 136; 140

8) Differentiate the roles of osteoclasts, osteoblasts, and osteocytes in bone.

Answer: 1. Osteoclasts are giant bone-destroying cells that break down bone matrix and release calcium ions into the blood. They are activated by a hormone called parathyroid hormone (PTH).
2. Osteoblasts are bone-forming cells. They add bone tissue to growing bones.
3. Osteocytes are mature bone cells. In their former lives, they were osteoblasts that laid down bone matrix, but became trapped in it.

Diff: 2  Page Ref: 137; 140
9) Explain how atlas and axis are different from other vertebrae. Discuss the roles they play in the body.

Answer: 1. Unlike all other vertebra, atlas (C1) has no body. Axis (C2) has a large process called the dens or odontoid process.
   2. The structural differences of these two vertebrae allow you to rotate your head from side to side to indicate "no." The joint between these two vertebrae is a pivot joint.

Diff: 2  Page Ref: 155

10) Differentiate among the three types of joints based on structural and functional classification. Provide examples of each type of joint.

Answer: 1. Synarthroses are immovable joints. These joints are structurally classified as fibrous joints since the bones are united by fibrous tissue. Skull sutures are one example of a fibrous joint.
   2. Amphiarthroses are slightly movable joints. These joints are structurally classified as cartilaginous joints since the bone ends are connected by cartilage. The pubic symphysis and intervertebral joints are two examples.
   3. Diarthroses are freely movable joints. These joints are structurally classified as synovial joints since the articulating bone ends are separated by a joint cavity containing synovial fluid. There are many examples of synovial joints, including the elbow, knee, and shoulder.

Diff: 3  Page Ref: 166; 168-169