

Midterm Exam

Name: _____

There are a number of questions where the phrase **at least** is used. You can add additional information to your answers for extra credit on these questions. **Station questions** (1-5) refer to questions which are associated with the stations set up with material to look at.

For all your answers, be as specific as possible.

1. *Station question.* Identify what part of the spine this is from. How do you know this? List the specific features that allow you to make this classification. (3 pts)

This vertebrae is from the thoracic part of the spine. The specific features are the articular facets (superior and inferior costal facets) for the ribs that are located on both the superior and inferior posterior margins of the vertebral body (connections for ribs is good for partial credit). The shape of the vertebral body is not definitive. The sharply inferiorly projecting spinous process is also a good clue, but not as definitive as the costal facets.

2. *Station question.* What type of tissue is this? List at least two features can you see? (2 pts, extra features 0.5 pt each)

This is compact bone. Features include: osteon, lacunae, canaliculi, central canal, matrix. Can't see osteocytes.

3. *Station question.* Identify the tissue and its function indicated with the pins (6 pts)

- a. *Spongy bone- support from stresses in many directions*
- b. *Articular cartilage-permits smooth motion of joint, prevents bone-to-bone contact*
- c. *yellow marrow-energy storage, also reserve capacity for blood cell synthesis.*

4. *Station question.* Discuss the two primary contexts addressed by this form. What are the medium and the century in which this might have been created? (6 pts)

Answer: the work includes both artistic/aesthetic narrative and medical/anatomical information. It is wax and was made around 18th century.

5. *Station question.* This model does not have the detail and accuracy of other anatomical models and was made small enough to be portable. How might this model have been used? (5 pts)

Answer: this model was probably used to explain the reproductive system and fetal development to female patients. Because it lacks anatomical detail and is so small, it was likely not used as an educational model for surgeons or other health-care providers.

6. Briefly describe what an **ecorche** is. (3 pts)

Answer: 3d forms of the flayed, male body, usually presented in thematic poses, ie, "The Dying Gaul" or equestrian poses, also Thomas Banks' Anatomical Crucifixion is considered an ecorche'

7. Provide a definition of art discussed in class. (3-5 pts)

Art is something made (by an artist) with the intention of providing an aesthetic experience for the viewer

8. Define the following terms: (2 pts each)

- Shape: *Answer: the words shape and form are often, inappropriately, used interchangeably. In art, they are as different as 2D and 3D. Shape referring to areas or masses of color or pattern, or enclosed areas circumscribed by line.*
- Scale: *Answer: refers to the size of one thing relative to another thing.*
- Abstraction: *Answer: refers to stylistic, often expressive distortions of otherwise recognizable forms and shapes*
- Nonobjective: *Answer: work having no discernable suggestion of identifiable objects.*
- Illusionistic: *Art that is convincingly portraying the object*

9. How were cadavers procured in the 14th – 17th centuries? (2 pts)

Generally executed criminals, sometimes grave robbers, in one instance, murder of vagrants.

10. What 16th century anatomist wrote De humani corporis fabrica? (2 pts)

Andreas Vesalius

11. What are the organelles involved in energy production? What is the primary chemical compound that these organelles produce? (2 pts)

Mitochondria produce ATP using glucose (sugar) and oxygen

12. You are looking at a microscopic slide of some type of connective tissue and are trying to determine if it is from a vertebral disc or a tendon. What features will you look for to make this determination and what will they indicate? (2 pts)

Look for the included cells within the tissue. Ligaments and tendons will have fibroblasts and their small dark nuclei will be visible. Cartilage will have chondrocytes which will appear in little hollow openings (lacunae) in the tissue (see photos on p 69, 70).

13. What is the joint at the distal end of the clavicle? Name the specific part of the structure that it connects to. (2 pts)

Acromioclavicular joint connects to the acromion on the scapula.

14. Extension of the joint at the distal end of the femur involves what muscles? Name **at least** two of them and give their origins and insertions. (6 pts, additional muscles with correct O/I 1 pt each)

Muscle name	Origin	Insertion
<i>Rectus femoris</i>	<i>Anterior inferior iliac spine</i>	<i>Tibial tuberosity (via patellar ligament)</i>
<i>Vastus medialis</i>	<i>Medial side of mid shaft of femur (medial lip of linea aspera)</i>	<i>ditto</i>
<i>Vastus lateralis</i>	<i>Lateral side of mid shaft of femur (lateral lip of linea aspera), proximal end (gluteal tuberosity)</i>	<i>ditto</i>
<i>Vastus intermedius</i>	<i>Anterior and lateral shaft of femur</i>	<i>ditto</i>

Partial credit awarded if you got distal/proximal mixed up and had the hamstrings with the correct info.

15. What is the muscle group that extends your spine? Which specific muscle in this group is the most lateral one? (2 pts)

Erector spinae, iliocostalis. Rotatories and multifidi also ok.

16. Which muscles are involved drawing your shoulder blades together and down your back. Be specific as to which muscles are responsible for which actions. (3 pts)

Both the middle fibers of the trapezius and the rhomboids draw the scapula in towards the spine. The lower fibers of the trapezius draw the scapula down. Pectoralis minor also depresses the scapula.

17. Start at the anterior superior iliac spine. Move your fingers slightly in both a medial and inferior direction. Curl your fingers into the iliac fossa and palpate the deeper muscle layer. What muscle are you palpating? Where does it insert and what is its action? (3 pts)

Iliacus muscle which inserts on the lesser trochanter (top of femur posterior side ok). The action of the iliacus is to flex the hip, laterally rotate the hip and adduct the hip (should have at least two actions 0.5 pt each). Psoas ok for partial credit, it's not in the iliac fossa. Iliopsoas ok.

18. List **at least** three structural types of synovial joints and give examples where these joints can be found in our bodies. (6 pts, additional joint types with correct example 1 pt each)

Structural joint type	Examples
<i>Plane joint- non axial or multiaxial</i>	<i>Ends of clavicles, between tarsal bones, between articular facets of vertebrae, ribs/vertebrae, carpals</i>
<i>Hinge- monaxial</i>	<i>Elbow, knee, interphalanges, tibia and fibula/talus joint</i>
<i>Pivot- monaxial</i>	<i>Between atlas and axis (C1 and C2), radius/ulna</i>
<i>Saddle- biaxial</i>	<i>Base of thumb</i>
<i>Ball and socket- triaxial</i>	<i>Shoulder and hip</i>
<i>Condylar- biaxial</i>	<i>Connection between fingers with metacarpals and toes with metatarsals, radius and carpals</i>

More examples may be given, look at tables p222-225 in HA for more examples. Synarthrotic and amphiarthrotic joints are not synovial.

19. Draw an outline of the spine showing the curves. Label and give the names for each region of the spine and the curves. How many vertebrae are in each region? (6 pts)

Cervical, lordosis, 7 vertebrae, Thoracic, kyphosis, 12 vertebrae, Lumbar, lordosis, 5 vertebrae, Sacrum, Coccyx. Should also accept cervical, thoracic, lumbar, and sacral as curve names.

20. Explain how sex is determined in a developing human embryo and outline the process. (6 pts)

Sex is determined by a number of different factors and processes. First is the parental contribution, the chromosome received from the male (X or Y). In general, XX results in female and XY results in male. On the Y chromosome there is the SRY gene which results in the synthesis of a protein that causes the sex organs to develop into testes which begin to secrete androgens and müllerian inhibiting factor. If the embryo has also has androgen receptors, it will develop into a male. If it doesn't have an SRY gene or is androgen insensitive, it will become female. The SRY gene can also end up on one of the X chromosomes and result in an XX male.

21. Osteoporosis is a disease where there is a significant reduction in bone mass. Explain, in terms of bone cell activity, the dynamic nature of bone and the mechanism for osteoporosis. (6 pts)

Bone is constantly being broken down by osteoclasts and being rebuilt by osteoblasts. Bone serves as a storage for calcium and can be built to store it or broken down to mobilize calcium.

Osteoporosis is a reduction in bone mass and a variety of factors can cause it by stimulating osteoclast activity to exceed osteoblast activity.

22. For each of the muscles shown, give name, origin, insertion, and action.

Muscle	Name (1 pt each)	Origin (1 pt each)	Insertion (1 pt each)	Action (1 pt each)
A	<i>psoas</i>	<i>Bodies & transverse processes of lumbar vertebrae</i>	<i>Lesser trochanter (posterior, proximal end of femur)</i>	<i>Flex hip, laterally rotate hip, adduct hip</i>
B	<i>External oblique</i>	<i>Lower eight ribs</i>	<i>Anterior part of iliac crest, abdominal aponeurosis</i>	<i>Flex vertebral column (both laterally and forward), rotate vertebral column</i>
C	<i>Sartorius</i>	<i>Anterior iliac spine</i>	<i>Proximal, medial shaft of tibia (pes anserinus tendon, extra 0.5 pt)</i>	<i>Flex hip, laterally rotate hip, abduct hip, flex knee, medially rotate flexed knee</i>
D	<i>piriformis</i>	<i>Anterior surface of sacrum</i>	<i>Greater trochanter</i>	<i>Laterally rotate hip, abduct flexed hip</i>

23. Label at least all the structures indicated. (1 pt each, additional 0.5 pt)

