

## Laboratory Review Questions - Part 1

### Week #1: Osteology and Torso Model Anatomy

1. Describe the functions of the patella. How is the patella different from other bones of the leg?
2. Name the bones of the pectoral girdle and the bones of the pelvic girdle. Compare the pectoral and pelvic girdles with regard to strength, function, and versatility.
3. What functions does the clavicle serve in the skeletal system?
4. To which bones does the scapula articulate?
5. Describe the bony arrangements which are involved in the elbow joint.
6. Describe the differences between a male pelvis and a female pelvis.
7. Describe the four major curvatures of the vertebral column. Define lordosis, kyphosis, and scoliosis.
8. What is the function of the thoracic cage? Distinguish between true, false, and floating ribs.
9. What are the functions of the acromion process and coracoid process of the scapula?
10. What is the function of the tibial tuberosity?
11. Describe differences between the adult skull and the baby skull.
12. You should be able to identify all of the structures listed on page 1-12 in the Kinesiology 142 Laboratory Manual.
13. You should be able to identify all of the listed structures in Table 2-1, describe the location of each structure, and give one major function for each structure.

## **Week #2: Somatotype and Body Composition Analysis**

1. Describe the standardized procedure for measuring the \*\*\*\* skinfold, \*\*\*\* girth or \*\*\*\* bone width. Describe subject position, instrument used, and step by step procedure. The asterisks represent any of the measures you were asked to carry out in the lab procedures.
2. Bioelectrical impedance techniques are used to determine percent body fat. Describe the principle on which this technique is based. Describe sources of error in this procedure.
3. In the O-Scale System of body composition assessment, what is the rationale for using a height adjustment when calculating the Adiposity rating and the Proportional Weight rating?
4. In the O-Scale System of body composition assessment, how is the Adiposity rating used to help interpret the Proportional Weight rating?
5. What advantages do the O-Scale System and the Canadian Physical Activity, Fitness and Lifestyle Appraisal – Health Body Composition Assessment procedure have in comparison to percentage body fat predictions from skinfold measurements, when used in individual assessments?
6. With reference to the O-Scale system of body composition assessment, describe the following terms – stanine scale, adiposity rating, proportional weight rating, balanced physique, dominant physique
7. In the Canadian Physical Activity, Fitness, and Lifestyle Appraisal – Healthy Body Composition Assessment procedure, what are the purposes of using the “sum of five skinfolds” value, and the waist girth measurement?

### **Week #3: Arthrology, & Flexibility**

1. Be able to define the planes and axes of the body. Be able to define the various terms of direction.
2. Be able to identify and give functions for the structures learned on the knee, hip, and shoulder joint models
3. Be able to define movements about the major joints.
4. Know the classification of joints - fibrous, cartilaginous, synovial.
5. Compare the hip and shoulder joints with respect to structure, strength and versatility of movement.
6. Name the joint that contains the: (a) glenoid cavity and labrum, (b) cruciate ligaments and menisci, (c) annular ligament and head of radius, (d) acetabulum and iliofemoral ligament
7. How do ligaments contribute to joint stability and mobility?
8. a) Name a bone that is distal to the humerus  
b) Name a bone that is proximal to the patella.  
c) Name a bone that is lateral to the sternum.
9. In the knee joint, what is the function of:
  - a) articular cartilage
  - b) synovial fluid
  - c) cruciate ligaments
  - d) collateral ligaments
  - e) menisci
10. Describe the function of the intervertebral disc during motion and in weight bearing.
11. Compare the structure and function of the elbow joint with that of the knee joint.
12. What ligament of the hip joint keeps the body, when in anatomical position, from falling backward at the hip?
13. What two general types of joints are found in the vertebral column?
14. Why is the anatomical position so important in explaining the movements that are possible at joints?
15. Name two of the joints that are considered to be part of the “shoulder joint” complex.
16. Why is dislocation of the humerus at the glenohumeral joint most likely to occur inferiorly?
17. Describe five different types of joint injuries.
18. At the ankle joint, compare inversion sprains versus eversion sprains. Which ligaments are most likely damaged in an inversion sprain?

19. Criticize the Sit & Reach test.
20. Distinguish between active range of motion and passive range of motion.
21. Define the term “goniometry”.
22. Why is precise measurement of joint range of motion important?
23. Does normal range of motion at one joint indicate that the subject will likely have normal range of motion at all joints? Explain.
24. Describe three types of devices that are often used when a precise measure of flexibility is desired.
25. Which joint movements are needed at the shoulder joint in order to successfully tuck the tail of your shirt into the back of your pants?

#### **Week #4: Muscle Anatomy and Movement Analysis**

1. For each of the muscles studied in this lab, you should know the location of the muscle and the joint movements that it performs.
2. You should be able to analyze the joint actions and muscles involved (prime movers only) in any movement. You must follow the movement analysis style described on pages 9-25 to 9-26 in the Kinesiology 142 Laboratory Manual.
3. Describe the role played by the gluteus maximus muscle in walking, running, and climbing stairs.
4. If your deltoid muscles were paralyzed, how would this affect the activities which you are able to perform?
5. In a duel in 1547, Jarnac defeated Chastaigneraie by slicing through the tissue behind the left knee. This is known in history as the "coup de Jarnac". Which muscles would be affected by such a cut. Would the victim be able to walk and/or run properly?
6. Describe four possible movements of the humerus that can occur at the shoulder joint, and name the prime mover(s) of each movement.
7. Why would individuals accustomed to wearing high-heeled shoes experience discomfort when wearing low-heeled shoes? Where might the discomfort be found and what are some possible anatomic and mechanical reasons?
8. How is walking different from running with regard to the use of hip joint muscle actions and range of motion?

## **Week #5: Measurement of Strength, Power & Muscular Endurance**

1. Distinguish between hip flexion and trunk flexion.
2. Why are there different protocols for the so-called "male" & "female" push-ups? Do you think that this is appropriate? Why or why not?
3. Critique the grip strength test. Do you think that the correlation between grip strength and overall body strength would be very high? Explain.
4. What is the vertical jump a test of? What factors can affect the distance jumped?
5. Differentiate between strength, power, and muscular endurance. Give an example of a test that was used in Kinesiology 142 for measuring each of these factors.
6. Explain the shape of your velocity versus force graph and your power versus force graph. What general information is given by these graphs regarding the optimal combination of force and velocity needed to obtain maximal power output?

## **Week #6: Biomechanics**

1. Which lever classes do a golf club, a swinging door, and a shovel belong to? Explain your answers using a diagram, if necessary.
2. How much force must be produced by the biceps brachii, attached at 90 degrees to the radius at 4.0 centimeters from the centre of rotation of the elbow joint, to support a weight of 95 newtons held in the hand at a distance of 32 cm from the elbow joint? Assume that the forearm and hand have a combined weight of 35 newtons and that their center of gravity is located 17 cm from the elbow joint.
3. Is the mechanical advantage of a first class lever greater than, less than, or equal to one?
4. Describe the various stance phase events and swing phase events during a gait cycle.
5. As any runner changes from a slow running speed to a faster and faster running speed he/she lands less flat-footed and more on the toes. Why?
6. Why is video useful for studying what is happening to the foot and leg during the support phase of running.
7. In running a 400 meter race, an athlete toes out on each stride so that her foot length measured in the direction of progression is 2.0 centimeters shorter than if she toed straight ahead. If her stride length averaged 2.00 meters per stride, how much more

distance could she cover in the same length of time (50 seconds) if she toed straight ahead?

8. Based on your muscle activity analysis in the Gait Analysis Lab, describe the role played by the hamstring muscle group during the gait cycle.