

# Mid-Term Assignment (Spring 2020) (DPT 2nd Semester- sec B)

Course Title: Human Anatomy II Instructor: Dr. Maria Feroze

Time Allowed: 48 hours Max marks: 30

Note:

This assignment has two sections (section 1: MCQs and section 2: Q/Ans). Solve both.

## SECTION 1: Multiple Choice Questions Max Marks: 15

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ID : 16810

1. Fibular shaft has

1. **Four borders**
2. Two borders two surfaces
3. Four borders four surfaces
4. Four surfaces
5. Two borders four surfaces

Which of the following is true?

- A. **1 and 4**
- B. 2, 3 and 4
- C. 1, 3 and 4
- D. 1,3 ,4 and 5

2. Neck of the femur connects the head of the femur with the shaft. It is cylindrical, projecting in a superior and medial direction. It is set at an angle of \_\_\_\_\_degrees to the shaft.

- A. 156
- B. 170
- C. **135**
- D. 101

3. The proximal area of the femur forms the hip joint with the acetabulum of the pelvis. It consists of a head and neck, and two bony processes the greater and lesser trochanters. There are also two bony ridges connecting the two trochanters; the intertrochanteric line anteriorly and the trochanteric crest posteriorly. Out of all these proximal bony landmarks which one is the most lateral palpable bony landmark?

- A. **Greater trochanter**
- B. Lesser trochanter
- C. The intertrochanteric line
- D. Trochanteric crest.

4. Patella is the bone of \_\_\_\_\_

- A. **Leg**
- B. Foot

- C. Only distal end of leg
- D. Both a and c

5. Metatarsal bones form the \_\_\_\_\_

- A. Hind foot
- B. **Mid foot**
- C. Fore foot
- D. Both b and c

6. Which of the following metatarsals usually has its growth plates situated proximally

- A. **First metatarsal**
- B. First and second metatarsals
- C. Second and third metatarsals
- D. Third metatarsal

7. The shaft of the femur descends in slight\_\_\_\_\_ for stability.

- A. Lateral direction
- B. **Medial direction**
- C. Posterior direction
- D. Diagonal direction

8. Which structure/s connects the apex of patella to the tibial tuberosity?

- A. **Patellar Ligament**
- B. Patellar Tendon
- C. Distal portion of the common tendon of the quadriceps femoris
- D. Both A and B
- E. All of the above

9. Below , the tibia articulates with \_\_\_\_\_

- A. Distal end of fibula only
- B. **Distal end of fibula and talus bone**
- C. Distal end of fibula, talus bone and a small portion of calcaneus
- D. All are true

10. Which of the following is the medial bone of lower leg?

- A. **Tibia**
- B. Fibula
- C. Medial cuboid
- D. Both a and c

11. Which of the following ligaments is fully covered by synovial membrane?

- A. Iliofemoral ligament

- B. Pubofemoral ligament
- C. Ischiofemoral ligament
- D. Transverse Acetabular ligament
- E. **Ligament of the head of femur**

12. The calcaneus is often fractured as a result of \_\_\_\_\_

- A. Distraction
- B. **Axial loading**
- C. Twisting
- D. Walking
- E. Sitting

13. The depth of the acetabulum is raised by the\_\_\_\_\_

- A. Acetabular fat pad
- B. Capsule of hip joint
- C. **Acetabular labrum**
- D. Ischial Bursa
- E. Both b and c

14. The most powerful ligament of hip joint is?

- A. **Iliofemoral ligament**
- B. Pubofemoral ligament.
- C. Ischiofemoral ligament.
- D. Transverse acetabular ligament
- E. All are powerful as they are ligaments of hip joint

15. Sartorius muscle helps in the movement of \_\_\_\_\_

- A. Flexion
- B. Flexion and abduction
- C. Flexion, abduction and lateral rotation
- D. **All are true**

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You can use Google as a source of help but refrain from copy pasting the data directly from these sources.

More than 25% plagiarism (similarity) in your answer will not be acceptable.

Attempt all questions from this section, all questions carry equal marks.

Q:1 Describe ankle mortise in your own words.

Answer 1:

### Ankle Mortise:

The talocrural joint is the only mortise and tenon joint in the human body. It is a synovial joint located in the lower limb. It is formed by the bones of the leg (tibia and fibula) and the foot (talus).

Definition The distal most aspect of the fibula is called the lateral malleolus. Together, the malleoli, along with their supporting ligaments, stabilize the talus underneath the tibia. The bony arch formed by the tibial plafond and the two malleoli is referred to as the ankle "mortise" (or talar mortise).

Articulating Surfaces: The ankle joint is formed by three bones; the tibia, fibula and the leg, and the talus of the foot:

The tibia and fibula are bound together by strong tibiofibular ligaments. Together, they form a bracket shaped socket, covered in hyaline cartilage. This socket is known as a mortise.

The body of the talus fits snugly into the mortise formed by the bones of the leg. The articulating part of the talus is wedge shaped-it is broad anteriorly, and narrow posteriorly:

Dorsiflexion – the anterior part of the talus is held in the mortise, and the joint is more stable.

Plantarflexion – the posterior part of the talus is held in the mortise, and the joint is less stable.

### Ligaments:

There are two main sets of ligaments, which originate from each malleolus.

#### 1: Medial Ligament:

The medial ligament (or deltoid ligament) is attached to the medial malleolus (a bony prominence projecting from the medial aspect of the distal tibia).

#### 2: Lateral Ligament:

The lateral ligament originates from the lateral malleolus (a bony prominence projecting from the lateral aspect of the distal fibula).

### Movements and Muscle Involved:

Plantarflexion and dorsiflexion are the main movements that occur at the ankle joint.

### Neurovascular supply:

The arterial supply is derived from the malleolar branches of the anterior tibial, posterior tibial and fibular arteries.

Innervation is provided by tibial, superficial fibular and deep fibular nerves.

Q:2 A patient comes to your clinic with gait imbalance. You ask him to stand upright from a sitting position and then rotate his left leg towards his left side. Which of the hip joint muscles of the left side become active during this whole movement?

Answer 2:

The hip joint muscles of the left side which become active during this whole movement are:

1. From sitting to stand upright: Movement starts from flexion when lifting up and ends on extension and the hip joint muscle that activates are; gluteus maximus; semimembranosus and biceps femoris (the hamstrings).

2. Rotation of the left leg towards leg side: Movement is lateral rotation or external rotation and the hip joint Muscles that activates are: biceps femoris, gluteus maximus, piriformis, assisted by the obturators, gemilli and quadratus femoris.

Q:3 Write down a note on:

- a) Articulations of calcaneus
- b) Difference in the size and shape of femoral condyles
- c) Weight bearing status of fibula

### Answer 3:

#### a. Articulation of calcaneus:

**Introduction:** The Calcaneus is a Latin word meaning "heel". It is the sizeable bone forming the heel. It is the largest bone of the foot. The calcaneus articulates with both the cuboid bone and talus within the tarsus.

The calcaneus acts as a short lever for the calf muscle, which insert into its posterior surface via the Achilles tendon. It is also provides attachment for other muscles and ligaments and participates in weight-bearing and stability.

#### Articulation:

The calcaneus has four articular surfaces, which include:

- (a) Superior articular surface (anterior, middle, posterior)
- (b) Anterior articular surface.

There are three superior articular surfaces on the calcaneus (anterior, middle, posterior). These are the surfaces for articulation with the talus.

The anterior articular surface of the calcaneus is the surface that articulates with the cuboid bone.

There are rough area located on the superior side of the calcaneus at the back of the heel, where the Achilles tendon inserts. This tendon, as well as other ligaments and muscles, is allows standing and walking. Therefore, if the calcaneus is fractured, it will cause difficulty in standing and walking.

### B. Difference in the size and shape of femoral condyles:

#### a. Medial condyle:

The medial condyle is larger than the lateral condyle due to more weight bearing caused by the center of mass being medial to knee. On the posterior surface of the condyle the linear aspera turns into the medial and lateral supracondylar ridges, respectively. The protrusion on the medial surface of medial condyle is referred to as the "medial epicondyle" and can be palpated by running fingers medially from the patella with the knee in flexion.

#### b. Lateral condyle:

The lateral condyle is the more prominent and is the broader both in its antero-posterior and transverse diameters.

Its lateral surface presents a bluge referred to as lateral epicondyle which gives connection to the fibular collateral ligament of the knee joint.

### C. Weight bearing status of fibula:

The fibula is a non-weight bearing bone that originates just below the lateral tibial plateau and extends distally to form the lateral malleolus, which is the portion of the fibula distal to the superior articular surface of the talus. The lateral malleolus provides key stability against excessive eversion of the ankle and foot. Fibula is a slender and long bone located on the outside of the lower leg, from outside and underneath the knee and extends down to form the outside of the ankle joint. ... Fibula bone plays a minor role in bearing the weight of the body as we walk. The tibia bears approximately 80% of the body weight.