

HSS 409/537: Kinesiology/Biomechanics

Quiz 3

Name _____

Please circle the correct response(s). There may be 0-4 correct responses for each item.

1. According to published research (ALL – DR. WESTCOTT’S LECTURE)
 - a. 8-12 RM appears to be the optimal intensity for a strength training set for most healthy adults (NO; DEPENDS ON MUSCLE FIBER TYPE: FAST TWITCH FEWER RM, SLOW-TWITCH MORE RM)
 - b. Three days of recovery appears to be the optimal amount of recovery between similar strength training exercises if done at high intensity (YES, MOST RESEARCH SUGGESTS THAT 72 HRS IS A BETTER RECOVERY PERIOD)
 - c. 4RM is more intense than 10RM (NO; BOTH LEAD TO FAILURE; CAN’T GET MORE INTENSE THAN THAT)
 - d. Strength training alone leads to more weight loss than cardio alone, if either are done 3-5 days per week (NO; STRENGTH + CARDIO LEADS TO MORE WEIGHT GAIN THAN CARDIO ALONE)

2. According to the impulse equation, when decelerating a baseball pitch with a catcher’s mitt:
 - a. The only variables the catcher can control are force or time (YES; P.306; “THE CATCHER CAN ONLY CONTROL THE LEFT SIDE OF THE EQUATION” WHICH ARE F OR t)
 - b. More padding leads to a smaller impulse (NO; P.305; IMPULSE EQUALS $F \times t$ WHICH DOES NOT CHANGE WITH PADDING SINCE $Ft = m(V_f - V_i)$ AND NEITHER MASS NOR THE VELOCITIES CHANGE)
 - c. To keep the deceleration force required the same for a 100 mph vs. an 80 mph pitch, the catcher needs to impose a larger t (YES; t, WHICH IS ON THE LEFT SIDE OF THE EQUATION, WOULD HAVE TO GO UP THE SAME PERCENTAGE AS V_i)
 - d. The final velocity is 0 (YES; THE FINAL VELOCITY IS WHEN THE BALL COMES TO REST IN THE GLOVE)

3. With a coefficient of static friction (μ) of 1.0 between a shoe and a surface:
 - a. The angle of incline used to determine the μ would be 45° (YES; THAT’S WHERE THE TANGENT OF THE ANGLE BECOMES 1.0, OR THE μ)
 - b. The normal force on level ground equals zero (NO; P.312, THE NORMAL FORCE ON LEVEL GROUND IS EITHER THE WEIGHT OF THE SHOE OR THE WEIGHT OF THAT PART OF THE WEIGHT OF THE ATHLETE ON THE SHOE)
 - c. F_{max} or an athlete standing on level ground in those shoes equals the weight of the athlete (YES; IT MUST BE SINCE THE NORMAL FORCE AND F_{max} MUST BE EQUAL SO THAT $\mu = 1.0$)

d. A basketball player could safely take a lean of 60° from vertical (NO; $0-45^\circ$ FROM VERTICAL IS THE MAX, BEFORE SLIDING OCCURS)

4. EXTRA CREDIT (3 pts ea): The quadriceps:

- a. In the concentric mode, generate much more of a rotary component of force than the hamstrings when the resistance force is the same (NO; OUR LAB EXERCISES SHOW THAT THE ROTARY COMPONENTS ARE ABOUT THE SAME)
- b. Generate much less overall force in the take-off phase of a maximum vertical leap than the landing phase because the landing velocity is greater than the take-off velocity (NO; VELOCITIES ARE THE SAME; THE t IS SMALLER FOR THE LANDING WHICH, ACCORDING TO THE IMPULSE EQUATION, MAKES THE FORCE LARGER)
- c. Are one of the primary muscle groups used for both the take-off and landing phase of the vertical leap (YES; QUADS ARE ONE OF THE PRIMARY ACCELERATORS AND DECELERATORS FOR THE VERTICAL LEAP)
- d. Unlike the biceps, maintain the same muscle line of pull angle with respect to the segment (YES; QUADS ON AN ANATOMICAL PULLEY, BICEPS NOT)