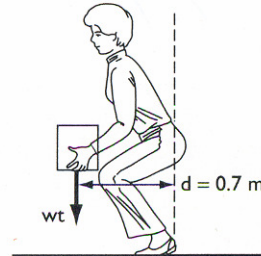


Sample Exam Questions: Chapter Five

1. A 23-kg boy sits 1.5-m axis from the axis of rotation of a seesaw. At what distance from the axis of rotation must a 21-kg boy be positioned on the other side of the axis to balance the seesaw?
  - a. 1.6 m
  - b. 2.6 m
  - c. 3.6 m
  - d. 4.6 m
2. How much force must be produced by the biceps brachii at a perpendicular distance of 3 cm from the axis of rotation at the elbow to support a weight of 200 N at a perpendicular distance of 25 cm from the elbow?
  - a. 1667 N
  - b. 1777 N
  - c. 1877 N
  - d. 1977 N
3. Two people push on opposite sides of a swinging door. If the first exerts a force of 40 N at a perpendicular distance of 20 cm from the hinge, and the second exerts of force of -30 N at a perpendicular distance of 25 cm from the hinge. What is the net torque acting on the door?
  - a. 0.5 Nm
  - b. 1.5 Nm
  - c. 2.5 Nm
  - d. 3.5 Nm
4. Which direction will the aforementioned door swing?
  - a. Towards the first person
  - b. Towards the second person
  - c. The door will not move
  - d. There is not enough information to determine the direction of motion
5. A worker holds a 90-N box at a distance of 0.7 m from the axis of rotation in her spine. Neglecting the effect of body weight, how much force must the lower back muscles exert, if the average moment arm ( $r$ ) is 6 cm, to hold the box?
  - a. 1050 N
  - b. 1050 Nm
  - c. More than 1050 N
  - d. More than 1050 Nm



6. What is not a mechanical factor in determining the stability of a person?
  - a. The height of the whole-body center of mass
  - b. The weight of the person
  - c. The nature of the base of support
  - d. The fiber type of the lower extremity musculature
  
7. The center of mass and center of gravity for an individual can be used interchangeably only if:
  - a. The individual is moving exceptionally fast
  - b. The individual is exhibiting a large degree of trunk flexion
  - c. The individual is very large
  - d. The center of mass and center of gravity are synonymous