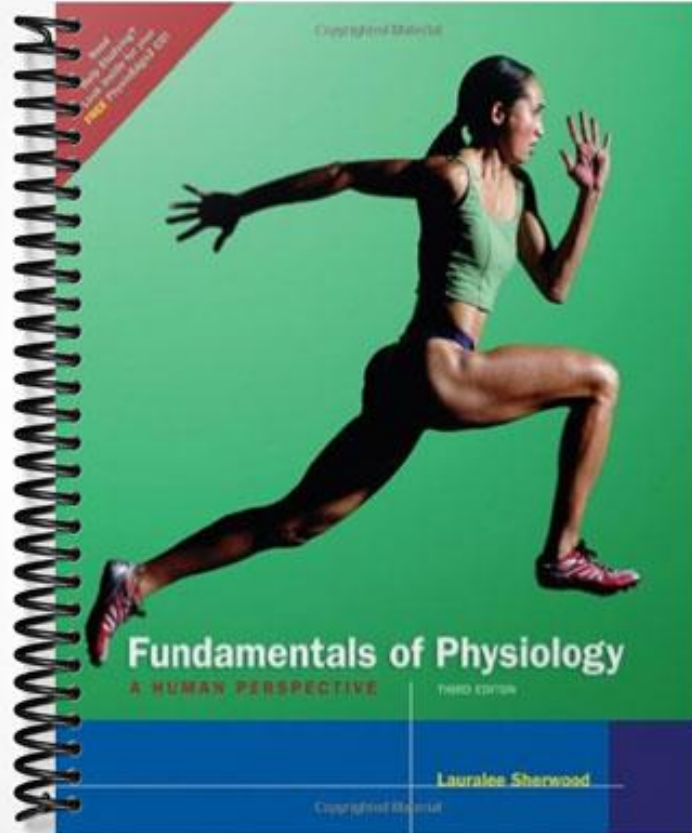


SOLUTIONS MANUAL



Beyond the Basics – Chapter 2

Aerobic Exercise: What For and How Much?

Travis, a 26 year old male who is 6 ft. tall and weighs 185 pounds, does high intensity weight-training at the gym five days a week. On the days that he does not weight-train, he walks 1.5 miles. Travis usually completes his walk in 15 minutes. His heart rate after walking is 125 beats per minute.

1. Which of his forms of exercise would be considered an anaerobic exercise?
2. Does weight training reduce his risk of developing hypertension and coronary artery disease? Why or why not?
3. Is the intensity of his walking enough to qualify as aerobic exercise? What are two things that you can base your answer on?
4. Calculate his maximum heart rate. What is the minimum number of beats per minute that would significantly improve his aerobic work capacity and reduce his risk of cardiovascular disease?
5. What cellular organelle functions in the conversion of fuel to ATP energy in aerobic exercise? Which metabolic pathways occur in this organelle?
6. Which metabolic pathway functions in the conversion of fuel to ATP energy during both aerobic and anaerobic exercise?
7. In order to improve his cardiovascular health, what recommendations would you make to Travis concerning his exercise program?

Answers:

1. Weight training would be considered an anaerobic exercise. See *Beyond the Basics* page 32
2. In order to reduce the risk of developing hypertension and coronary artery disease, one should participate in some form of aerobic exercise. See *Beyond the Basics* page 32
3. No, the intensity of his walking is not enough to qualify as aerobic exercise. The American College of Sports Medicine recommends that an individual participate in aerobic exercise a minimum of three times per week for 20 to 60 minutes. Travis is only walking two days a week and then only for 15 minutes each day. His heart rate of 125 beats per minute after walking is not 70 to 80% of his maximum heart rate. See *Beyond the Basics* page 32
4. His maximum heart rate is $220 - 26$, which equals 194. The minimum number of beats per

minute that would significantly improve his aerobic work capacity and reduce his risk of cardiovascular disease is 70% of his maximum heart rate or 136 beats per minute. See *Beyond the Basics* page 32

5. The mitochondrion is the organelle that functions in the conversion of fuel to ATP energy in aerobic exercise. The metabolic pathways involved are the citric acid cycle and the electron transport chain. See *MITOCHONDRIA AND ATP PRODUCTION* page 26, *CITRIC ACID CYCLE* page 27, and *ELECTRON TRANSPORT CHAIN* page 29
6. Glycolysis functions in both aerobic and anaerobic respiration. See *GLYCOLYSIS* page 27
7. Travis would probably benefit from increasing his aerobic activity and should probably put less emphasis on weight-lifting. See *Beyond the Basics* page 32