Exercise 1.
True-False. Indicate whether each of the following statements is true or false by clicking on (or if you are using a printed hard copy circling) + if true and O if false. If the statement is false, correct it in the space provided.

+ O 1. An acute exercise session does not impact either the tonic or episodic signaling hormones; therefore, acute exercise cannot impact appetite.

+ O 2. A single acute bout of exercise that expends 300 kcal decreases appetite and food intake from 30 minutes to 8 hours after the activity.

+ O 3. It appears that the physiological factors that modify appetite/food intake in response to hunger or a deficit energy intake are more finely tuned/efficient than those factors that respond to satiety or an increase in energy intake.

+ O 4. Skeletal muscle is the largest consumer of energy at rest, accounting for approximately one-third (29–32%) of total energy expenditure.

+ O 5. At all ages, average weight females have lower RMR (1,200–1,450 kcal⋅d\(^{-1}\)) than same aged average weight males (1,500–1,800 kcal⋅d\(^{-1}\)).
+ O 6. The RMR of obese individuals is lower than the RMR of normal-weight individuals and is a contributing factor to their obesity.

+ O 7. Both severe caloric restriction and a short-term excessive ingestion of calories decrease RMR.

+ O 8. According to the set-point theory of weight control, the hypothalamus integrates/interprets signals about changes in body mass/body fat and sends out signals to modify food intake or energy expenditure to correct any deviation. Numerous studies have proven the existence of such a set-point.

+ O 9. During exercise and the excess postexercise oxygen consumption (EPOC) period after exercise, RMR is elevated proportionally to the exercise intensity.

+ O 10. Exercise training (both aerobic endurance and dynamic resistance) increases RMR independent of caloric intake, level of training, and changes in muscle mass.

+ O 11. In stimulated brown adipose cells, protons move through an alternative uncoupling protein 1 (UCP1) channel instead of the ATP synthase complex in electron
transport, thus producing twice the normal number of ATP that can be used to burn off energy and produce a deficit.

+ O 12. White adipose tissue may be “browned” becoming beige adipose tissue in response to cold, exercise, and specific hormones.

+ O 13. Most studies comparing the thermic response of lean and obese individuals after ingestion of a test meal show a blunted TEM in the obese.

+ O 14. The caloric equivalent value of 3,500 kcal·lb$^{-1}$ fat is an oversimplification and overestimation as an energy deficiency prescription for weight loss.

+ O 15. The proportion of %BF and fat-free weight loss with very severe to moderate dietary restriction is direct. That is, the greater the caloric restriction, the greater the %BF loss and FFW maintenance.

+ O 16. Bone loss often accompanies weight loss brought about by caloric restriction alone.
+ O 17. Restricting water intake while dieting causes a higher proportion of fat and lower proportion of water to be lost.

+ O 18. Exercise is the key to weight loss, with or without the attainment of an overall caloric deficit.

+ O 19. Nonresponders who fail to lose the expected amount of weight/fat as a result of participation in a structured exercise program may simply be individuals who “compensate” for the energy expended during the exercise sessions by spontaneously reducing their activity energy expenditure the rest of the day and thus have no true energy deficit.

+ O 20. For long-term weight control, it is important in active individuals to minimize exercise variation and/or to match exercise variation with conscious equal adjustment in energy intake.

+ O 21. With a proper exercise regimen, it is possible to be in a negative caloric deficit but either maintain or increase fat-free weight.

+ O 22. Average %BF from successful athletes make realistic goals that up-and-coming competitors who wish to be successful should achieve.
+ O 23. Although exercise training alone does not consistently decrease body weight in children and adolescents, it does bring about decreases in body fat and increases in fat-free mass.

+ O 24. The macronutrient content (CHO, PRO, fat) of any diet is less important than the attainment of a negative caloric balance and the health implications of the diet.

+ O 25. Cardiovascular fitness in children and adolescents is inversely associated with abdominal obesity independent of time spent at different intensities of physical activity or total physical activity.

+ O 26. Fat is preferentially mobilized from adipose cells located near active muscles; therefore, the way to remove fat from unwanted locations is to repeatedly contract the muscles in that location.

+ O 27. It is possible to change one’s body shape (e.g., from gynoid to intermediate) by reducing %BF.
+ O 28. The way to lose fat is to burn fat by doing long-duration, low-intensity exercise workouts.

+ O 29. Exercise strategies to prevent weight gain include a minimum of 10–30 min·d⁻¹ or 90 min·wk⁻¹ of physical activity for adults and 30 min·d⁻¹ or 150 min·wk⁻¹ for children.

+ O 30. In calculating the energy cost of an activity session, the net, not the gross, value should be used because the individual would have expended the resting amount even if sedentary.

+ O 31. Food efficiency increases when the calories needed to sustain a certain weight (or %BF) increases; food efficiency decreases when the calories needed to sustain a certain weight (or %BF) decreases.

+ O 32. There is emerging evidence that fluctuations in cardiovascular risk factors put more stress on the CV system of those who were initially overweight/obese who lost and rapidly regained their weight than on those who were lean and did not need to lose weight but did so and also regained it, leading in both cases to weight cycling.
Exercise 2.

Table. Complete the following table describing the impact of acute exercise responses, exercise training adaptations, and dietary restriction on the four components of the caloric balance equation. Indicate whether the component will increase (↑), decrease (↓), or remain the same (=). Add qualifying explanations where needed. More than one descriptor may be used.

<table>
<thead>
<tr>
<th></th>
<th>Exercise Response</th>
<th>Training Adaptation</th>
<th>Dietary Restriction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise/work expenditure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMR/RMR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermogenesis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food ingested</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Calculations. Complete the following calculations. Write out all of the steps in the space provided.

1. Calculate the estimated resting metabolic rate for the individual whose information follows:
   Sex = female; Age = 19 years; Height = 5’6”; Weight = 145 lb

2. To determine the impact of age on resting metabolic rate, use the information in number 1 above, but change the individual’s age to 50 years.

3. Calculate the range of additional kilocalories of energy expenditure for an individual with a BMR of 1,250 kcal·d\(^{-1}\) to be considered very active using physical activity level (PAL) values.

Exercise 4.
Match the training principle from Column II with the application in Column I. Use each principle in Column II only once to get the best fit for all. Note Warm-Up/Cooldown cannot be specifically applied for weight control.

<table>
<thead>
<tr>
<th>Column I: Application</th>
<th>Column II: Training Principle</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____ An individual achieves a combined dietary restriction and exercise energy expenditure of 750 kcal·d(^{-1}).</td>
<td>A. Specificity</td>
</tr>
<tr>
<td>_____ Dana has achieved her goal weight but continues to monitor her caloric intake at 2,200 kcal·d(^{-1}) and to workout (stair-stepping 30 min and doing core calisthenics) 3 days per week.</td>
<td>B. Overload</td>
</tr>
<tr>
<td>_____ An individual loses 20 lb in 6 months, but by 1 year from the start of the weight loss has regained all of the weight.</td>
<td>C. Adaptation</td>
</tr>
</tbody>
</table>
During week 1 of a weight loss program, an individual loses 2 lb that is composed of 50% water, 5% muscle mass, and 45% fat. During week 20, the same 2-lb weight loss is composed of 5% water, 2% muscle mass, and 93% fat.

Tomas and Jason both decide to lose weight. Tomas cuts his caloric intake by 550 kcal·d−1 and adds a daily 1-mile walk (~100 kcal). Jason decreases his caloric intake by 400 kcal·d−1 and begins to run 2–3 mi (~200–300 kcal), 4 days per week.

A 75-kg individual expends 0.15 kcal·kg⁻¹·min⁻¹ playing handball; 0.017 kcal·kg⁻¹·min⁻¹ of that expenditure is RMR. Therefore, he must exercise 30 min to expend 300 kcal.

Pamela increases her 3 d·wk⁻¹ elliptical strider workout from 20 to 25 min and adds a second set to her 2 d·wk⁻¹ weight lifting while maintaining an 1,800 kcal·d⁻¹ food intake.

Note: Warm-up and cooldown cannot be specifically applied for weight control.