

30) Bioenergetics is the field of study concerned with the transfer of energy in reactions occurring in living cells.

31) 1000 "small c" calories in one "capital C". Capital C calories are found on food labels.

$$33) a - .234 \text{ Cal} \times \frac{1000 \text{ cal}}{1 \text{ Cal}} = \boxed{234 \text{ cal}}$$

$$b - .0991 \text{ kcal} \times \frac{1000 \text{ cal}}{1 \text{ kcal}} = \boxed{99.1 \text{ cal}}$$

$$34) a - 4.14 \text{ J} \times \frac{1 \text{ cal}}{4.184 \text{ J}} = \boxed{.989 \text{ cal}}$$

$$b - 36.2 \text{ kJ} \times \frac{1000 \text{ J}}{1 \text{ kJ}} \times \frac{1 \text{ cal}}{4.184 \text{ J}} = \boxed{8.65 \times 10^3 \text{ cal}}$$

36) An exothermic rxn releases heat to its surroundings. In an exothermic rxn, the products are lower in energy than the reactants. An endothermic rxn absorbs heat from its surroundings. In an endothermic rxn, the products are higher in energy than the reactants.

37) In an exothermic rxn, the products are lower in energy than the reactants. If the reaction is reversed, the products become the reactants and the reactants become products. In the reversed rxn, the products are higher in energy than the reactants; therefore the reverse rxn is endothermic.

38) The heat from burning propane in a BBQ grill comes from breaking down and making the bonds in the chemical reaction between propane and oxygen to form carbon dioxide and water.

39) a - Exothermic; Heat is a product of the rxn.

b - Exothermic; Heat is a product of the rxn.

c - Endothermic; Heat needs to be added to the rxn.

d - Endothermic; Heat needs to be added to the rxn.

40) A - Breaking Chemical Bonds releases energy. (Making Chemical Bonds
 ↓ photosynthesis absorbs energy.

8.2 continued.

41) A Calorimeter is the name of the instrument that measures the heat content of various substances.

$$43) a- 27g \text{ protein} \times \frac{4 \text{ Cal}}{1 g \text{ protein}} = 108 \text{ Cal}$$

$$71g \text{ fat} \times \frac{9 \text{ Cal}}{1 g \text{ fat}} = 639 \text{ Cal}$$

$$28g \text{ Carbs} \times \frac{4 \text{ Cal}}{1 g \text{ carbs}} = 112 \text{ Cal}$$

$$108 + 639 + 112 = \boxed{859 \text{ Cal}}$$

$$c- 7g \text{ protein} \times \frac{4 \text{ Cal}}{1 g \text{ protein}} = 28 \text{ Cal}$$

$$9g \text{ fat} \times \frac{9 \text{ Cal}}{1 g \text{ fat}} = 81 \text{ Cal}$$

$$0g \text{ Carbs} \times \frac{4 \text{ Cal}}{1 g \text{ carbs}} = 0$$

$$28 + 81 + 0 = \boxed{109 \text{ Cal}}$$

44) Water does not contain any fats, proteins, or carbohydrates that can be metabolized to produce energy. Milk contains fats, proteins, and carbohydrates that can be metabolized to produce energy.

45) Adenosine Triphosphate (ATP) serves as the important energy carrier molecule between catabolic and anabolic reactions.

47) Carbohydrates, fats, proteins

48) Catabolic rxn's release energy and convert larger molecules into smaller molecules. ~~A~~ ~~d~~

49) The synthesis of proteins is an anabolic pathway.

50) The exhaust cannot be used as fuel for the car because the reverse reaction is an endothermic rxn & does not produce energy.