Endocrine System: The Actions of Hormones on Target Cells

1. The receptor is activated by the input signal that is the ______________.
   This signal causes a biochemical change in the cell. Name three of the five possible changes listed.
   ______________
   ______________
   ______________

2. Water soluble proteins such as __________ and ______________ bind to receptors located where on the cell? ________________

3. G proteins:
   -What is bound to the G protein in the inactive state? ________ In the active state? ________
   -What catalyzes the conversion of ATP to cAMP? ________ ________
   -What is known as the first messenger? ________ Second messenger? ________
   -A molecule of cAMP activates ________ ________ __, which can phosphorylate many proteins.
   -A single molecule of a hormone can have a large effect on the cell due to this process called ________.
   -What is the enzyme that inactivates cAMP? ________________

4. Insulin:
   -Insulin decreases plasma glucose, amino acids and fatty acids by stimulating the conversion of them to their storage form. Name these storage forms.
     glucose → __________
     amino acids → __________
     fatty acids → __________
   -Conversion to the storage form is known as ________ metabolism.
   -After a meal, high levels of glucose, amino acids and fatty acids lead to a/an (decrease or increase) in insulin secretion.
   -The autonomic nervous system also regulates insulin secretion. What effects would the sympathetic and parasympathetic system have on insulin secretion?
     Sympathetic → __________
     Parasympathetic → __________
   -Insulin travels in the blood and binds to what type of receptors on the cell membrane? __________
   -What is the approximate half-life of insulin? __________
   -What hormone increases plasma glucose levels? __________ This hormone breaks down the storage forms and this is known as ________ metabolism.
5. Diabetes:
- Type (1 or 2) diabetes is characterized by a resistance of the target cells to insulin. Plasma insulin levels are normal or high.
- In type 1 diabetes, the lack of insulin and glycogenolysis in the liver leads to (hypoglycemia or hyperglycemia).
- With the increase in filtration of glucose at the kidneys the carriers become ________ and glucose appears in the urine, also known as ____________.
- Glucose acts as an ________ ________ leading to increased urine flow.
- Increased lipolysis produces an increase in ________ ________ which when used as fuel produces ____________.
- The presence of these in plasma and urine is known respectively as ____________ and ____________.

6. Lipid soluble hormones such as ________ and ________ hormone bind to receptors located ____________.
- Once the hormone binds to the receptor, the ________ dissociates from the receptor complex.
- The hormone receptor complexes act as ____________ ________.
- The receptor-hormone complex then binds to ______.
- The mRNA produces ____________ that catalyze biochemical reactions in the cell.

7. Cortisol is classified as a ________ hormone. Name 4 major actions of Cortisol.

_________________________  _______________________
_________________________  _______________________

These actions are important for the stress response.

8. The main function of thyroid hormones is: _________________.
Three other specific functions include:

_________________________
_________________________
_________________________