You should write on this paper. Its ok!!!!!!!!!!

Name: _____ Period:_____

Instructions:
-Use the Scantron Form to answer the multiple-choice questions.
-Below: Answer 2 of the 3 short long questions. Also answer 1 of the 2 long response questions.

SHORT ANSWER QUESTIONS: (choose 2 of the 3 options 23, 24, and/or 25) 10 pts each.

23. There are 3 phases of signal transduction. Identify and summarize purpose of the phase. Describe where it occurs. Give an example of each phase. (You may draw and describe the process if it helps).

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24. Choose 3 of the 4 following communication types:
Describe the following cell signaling communication processes. Provide an example of the communication type. Also, describe the evolutionary advantage of using different communication types.

Juxtacrine-

Autocrine-

Paracrine-

Endocrine-

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25. Describe positive and negative feedback mechanisms. Provide an example of each. Describe why these mechanisms are essential to maintain body homeostasis.

LONG RESPONSE QUESTIONS: Choose 1 of the 2 options: questions 26 or 27 (10 pts).

26. The process of mitosis has several phases which allow the cell to divide. Identify each phase of mitosis. Describe 3 major events which occur in each phase. Also, identify how many chromosomes are in each phase for a normal human cell.

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27. When cells release signal molecules to send a message, and the message is received, a host of events take place in the cell. The ultimate goal is a response. One pathway is demonstrated by the G Protein which we discussed in class.

a) Below are the steps of the G Protein transduction pathway. Identify the correct molecule which occurs in that step:

Step 1: The ___(molecule 1) _____binds to the protein in the cell membrane and changes its shape.

Step 2: The alpha subunit breaks off from the G protein and activates an enzyme called ___(molecule 2)___.

Step 3: The enzyme converts ATP to ___(molecule 3)____.

Step 4: ___(molecule 4)_____ binds to a protein __(molecule 5)____ which has catalytic and regulatory units.

Step 5: _(molecule 4)_ binds to the regulatory parts of protein ___(molecule 5)___ and allows the release and activation of the catalytic parts.

Step 6: The catalytic parts are phosphorylated by ___(molecule 6)____ and are used to activate enzymes which break down ____(molecule 7)_____ into glucose.

Word Bank (items may be used more than once or not at all)

Adenylyl Cyclase	cAMP	Ligand
ATP	GTP	Glycogen
ADP	GDP	Kinase

Molecule 1: _____

Molecule 2: _____

Molecule 3: _____

Molecule 4: _____

Molecule 5: _____

Molecule 6: _____

Molecule 7: _____

b) What is a second messenger? Identify the second messenger in the G Protein example.

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c) Identify what cells would use this process in the body?