1. Asthma attack is characterized by the obstruction of bronchi in response to histamine secreted by mast cells in the bronchi. Which type of signaling does it represent?
   - Paracrine
2. Glucagon, a peptide hormone that increases blood glucose levels
   - Binds to the receptor and activate a signal transduction cascade
3. Testosterone binds to receptors in….
   - Nucleus
4. G proteins use a cycle of _________ and _________ to switch a protein on and off.
   - GTP binding, hydrolysis
5. Which enzyme makes cAMP from ATP?
   - Adenylyl cyclase
6. Cholera toxin permanently activates Gs protein and increases cAMP levels in the cells. What will happen?
   - Increase blood glucose levels
   - Increase in transcription
7. Low levels of cAMP phosphodiesterase will result in
   - Prolonged stress response
8. Adapter proteins
   - Operate via direct protein-protein contact

Based on the graph on the right answer following question
9. Which mechanisms provide amplification of adrenaline action in the cell
   - Phosphorylation cascades
   - Activation of G proteins

10. A person has an anaphylactic reaction and uses his epi-pen. Upon arrival in the E.R. the patient has an increased blood glucose level, what type of the receptor is responsible for the change in blood glucose level?
    - G protein Coupled Receptor

Which of the following cascades utilizes cAMP as a second messenger?
11. Increased transport of glucose into muscle cells – no, that’s RTK (receptor tyrosine kinase)
12. Stress Response –yes β adrenergic receptor
13. Activation of light receptive neurons – no, that’s cGMP
14. Release of glucose from liver into a blood stream – yes, both adrenergic and glucagon receptors use cAMP

15. General Adaptation Syndrome (GAS) is divided into 3 specific phases
    - Alarm phase, resistance phase, exhaustion phase
16. Gluconeogenesis is a dominant process during
    - resistance phase of stress response
17. Inhibition of β adrenergic receptors by drugs called β blockers causes
   • Decrease of heart rate
18. In muscle cells, glycogen breakdown is activated by
   • Ca²⁺
   • protein kinase A
19. In _______ cells glucose-6-phosphate from breakdown of glycogen is converted to glucose and exits to blood
   • Liver
20. Each odorant sensitive neuron in the olfactory epithelium expresses
   • one type of smell receptor
21. In unstimulated rod cells, the intracellular concentration of
   • cGMP is high
22. A flash of light causes
   • Hyperpolarization of rods and cones
23. During flash of light the intracellular concentration of cGMP in rods
   • Will decrease
24. Light adaptation process includes
   • Phosphorylation of rhodopsin
   • Binding of arrestin
25. In the visual pathway high levels of glutamate will cause
   • inhibition of bipolar cells
26. Viagra is a drug that inhibits cGMP phosphodiesterase. One of the side effects of Viagra might be impaired vision. This effect is due to
   • Depolarization of rods and cones
27. Insulin is a hormone secreted by
   • Pancreatic β cells
28. Pancreatic β cells need to be ____________ in order to secrete insulin.
   • Depolarized
29. The sulfonylurea receptor can be used to increase secretion of insulin from pancreatic β cells
   • Only when pancreatic cells are capable of secreting insulin
30. Which tissues have the ability (metabolic pathways) to store glucose “for later use”
   • Muscle
31. Which is NOT a physiological role of insulin?
   • Enhances transport of glucose into the cells (insertion of GLUT4 into the membrane)
   • Activates glycogen synthase
   • Activates glucokinase
32. Damage to insulin receptors will cause
   • Increase of blood glucose levels
33. In which step of actin polymerization subunits are added and lost at the same rate?
   • Steady state
34. Which portion of myosin interacts with actin filaments?
   • The head domain
35. A head domain of myosin molecule
   • Binds actin and hydrolyses ATP
   • Is responsible for generating force
   • Is the most conserved region in myosin
36. During contraction of striated muscles
   • Myosin pulls actin filaments together
   • ”Walking” of myosin causes sarcomere to shorten
   • Myosin ”walks” toward the barbed end of actin
37. Which protein motif do you expect to find in Ca^{2+} sensitive proteins such as tropomyosin?
   • Helix-loop-helix (that is Ca binding motif)
38. The functional unit of a muscle cell is
   • Sarcomere
39. Recovery of calcium back to intracellular stores after skeletal muscle contraction is accomplished by
   • A pump
40. Anticancer drug vinculin blocks polymerization of microtubules. Which processes in the cell are affected?
   • Formation of mitotic spindle