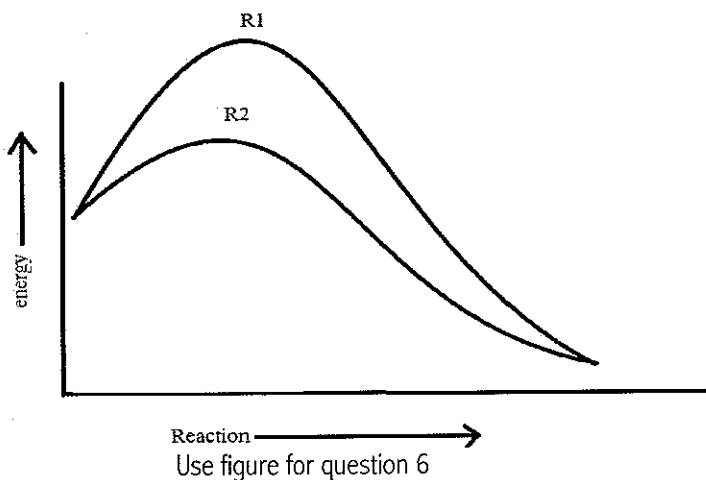


Mock Exam 2

- Amino acids are joined together by peptide bonds to form polypeptide chains. This is an example of:
 - Positive Feedback
 - Anabolism *build up*
 - Catabolism *break down*
 - Hydrolysis
 - Negative Feedback
- Several muscle cells are extracted from an organism and placed in to a beaker containing a glucose solution. Which of the following would you expect to be an observation?
 - The temperature of the solution decreases
 - The temperature of the solution increases
 - The volume of the solution increases
 - The solution becomes cloudy

breakdown of ATP is exergonic rxn so heat is released
- Exergonic reactions utilize _____ to do work and become _____.
 - Kinetic energy, more stable
 - Kinetic Energy, less stable
 - Free Energy, less stable
 - Free Energy, more stable

also increases entropy (ΔS) \rightarrow as heat
- A reaction is carried out without an enzyme and then with an enzyme. What would you expect the difference to be, if any, between the two reactions?
 - Change in E_a
 - Change in ΔG
 - No change
 - Change in reactant concentration
 - Change in product concentration
- How does the shape of an enzyme change when its substrate binds?
 - The enzyme undergoes a complete shape change
 - Nothing, the enzyme and substrate fit together like a lock and key
 - The enzyme molds around its substrate *induced-fit model \rightarrow the bond is not rigid*
 - The polypeptide chains that comprise the enzyme unwind



6. Which of the reaction curves shown has a higher ΔG ? *enzymes don't affect ΔG*
- Reaction 1 because it has a higher maximum energy
 - Reaction 1 because there is a greater difference between the transition state energy and the product energy
 - Reaction 2 because it has a lesser difference between the transition state energy and the product energy
 - Reaction 2 because the energy of its transition state is lower in energy than the transition state of Reaction 1
 - Neither reaction 1 nor 2
7. The concentration of an enzyme before a reaction is 0.001 M. What would be the concentration of the enzyme after the reaction? *enzymes aren't used up in rxns, they're recycled*
- 0.0001
 - 0.002
 - 0.001
 - The concentration would increase exponentially
8. Succinylcholine is structurally identical to acetylcholine. When succinylcholine is added to a mixture containing acetylcholine and the enzyme that hydrolyzes the compound, the rate of acetylcholine hydrolysis greatly decreases. The best example for this observation is:
- Succinylcholine is an allosteric regulator
 - The activation energy required for the hydrolysis of Succinylcholine is lower than that of Acetylcholine
 - Succinylcholine is a non-competitive inhibitor
 - Succinylcholine is a competitive inhibitor *→ succinylcholine binds to the active site blocking acetylcholine from binding*
 - The presence of Succinylcholine converts Acetylcholine into Succinylcholine
9. T/F Allosteric enzymes oscillate between two forms via competitive inhibitors
10. Reducing agents: *Reducing agents are themselves oxidized*
- Accept electrons
 - Donate electrons
 - Cannot be oxidized
 - Gain a negative charge
 - None of the above
11. How does Glycolysis differ from the electron transport chain (ETC)? *substrate vs. oxidative phosphorylation*
- Glycolysis transfers electrons between carrier molecules while the ETC does not utilize electron carriers
 - Glycolysis produces no net ATP while the ETC nets ATP and NADH
 - Glycolysis produces ATP by utilizing phosphates in compounds while the ETC utilizes electron carriers to produce ATP
 - There is no difference, both processes utilize oxidative phosphorylation
 - None of the above
12. Which types of enzymes play an important role in substrate-level phosphorylation?
- Kinases *→ these move P_i around*
 - Isomerases *→ convert b/w isomers*
 - Mutases
 - Enolases

13. What role does phosphofructokinase play in Glycolysis?
- It converts molecules into their isomers
 - It is an allosteric regulator
 - It transfers phosphate groups
 - Both A & B
 - Both B & C
14. Which molecule contains the most chemical energy?
- Fructose 6-phosphate
 - Glucose-6-phosphate
 - 1,3-bisphosphoglycerate (it has 2 phosphate groups)
 - Glyceraldehyde 3-phosphate
15. During the conversion of glyceraldehyde 3-phosphate (G3P) to 1,3-bisphosphoglycerate:
- NAD⁺ is oxidized to NADH and the sugar is oxidized
 - NAD⁺ is reduced to NADH and the sugar is oxidized
 - Electrons are lost as water
 - ATP is used to add a phosphate group to G3P
16. What would happen to cellular respiration if coenzyme A could not be synthesized?
- ~~Glucose could not be broken down~~
 - ~~Glycolysis could not occur~~
 - The Citric Acid Cycle could not occur
 - The electron transport chain could not occur
 - All of the above
- CoA has to be added to pyruvate for it to be able to enter mitochondria
17. Citrate is formed from the union of:
- Malate and Acetyl CoA
 - Oxaloacetate and Acetyl CoA
 - Pyruvate and Malate
 - Pyruvate and Oxaloacetate
- citrate = 6 C
18. How many ATP could be produced from the oxidation of ONE Acetyl CoA molecule
- 10
 - 1
 - 7.5
 - 8.5
 - 12
- $3 \text{ NADH} \times 2.5 = 7.5$
 $1 \text{ FADH}_2 \times 1.5 = 1.5$
 $1 \text{ ATP} = 10$
19. What changes occur between isocitrate and alpha-ketoglutarate?
- NADH and ATP are produced
 - NADH and CO₂ are produced
 - Only CO₂ is produced
 - Only NADH is produced
20. A genetic mutation blocks the formation of cristae in the mitochondria. Which process would be affected?
- Glycolysis
 - Citric Acid Cycle
 - Transition reaction
 - Electron Transport Chain
 - All of the above
- [H] gradient couldn't happen
21. What would happen if the second complex of the electron transport chain was eliminated?

- a. NADH would not be able to bind
 - b. FADH_2 would not be able to bind
 - c. There would be an increase in the amount of ATP created
 - d. The electron transport chain would not function at all
22. Fats and proteins can also be used to harness energy. How do these molecules enter cellular respiration?
- a. As G3P
 - b. As a pyruvate molecule
 - c. They can enter as more than one type of molecule
 - d. Acetyl Co-A
23. A cell is actively undergoing cellular respiration. There is not much need for ATP so it begins to accumulate in the cell. How will this affect cellular respiration?
- a. Because ATP is readily available, it will be used to break down glucose and make more ATP
 - b. Phosphofructokinase increases its affinity for fructose 6-phosphate
 - c. Phosphofructokinase decreases its affinity for fructose 6-phosphate
 - d. The active site for hexokinase is blocked, prohibiting the binding of glucose
24. What would happen if a plant lacked its stomata?
- a. The plant would not lose water to evaporation, therefore photosynthetic output would increase
 - b. The plant would not lose oxygen through the stomata, therefore photosynthetic activity would increase
 - c. The plant would not be able to get CO_2 , therefore photosynthetic activity would decrease
 - d. The plant would not be able to get O_2 , therefore photosynthetic activity would decrease
 - e. The plant would not be able to absorb light therefore photosynthetic activity would decrease
25. You have the ability to design a new type of plant. Which of the following would allow the plant to produce the most amount of energy?
- ~~a. Photosystem I absorbs wavelength 750~~
 - b. Photosystem I absorbs wavelength 380
 - c. Plastoquinone absorbs wavelength 750
 - d. Plastoquinone absorbs wavelength 380
26. How is the "electron hole" created in a photosystem?
- a. Water is split and the oxygen is released
 - b. Electrons are removed from the primary acceptor and transported to the electron transport chain
 - c. The absorption of light in photosystem I causes photosystem II to become more positive, creating a hole
 - d. Electrons are transferred from chlorophyll a to the primary acceptor.
27. While cellular respiration uses _____ to drive the synthesis of ATP, photosynthesis utilizes _____.
- a. Hydrogen ion gradient, the splitting of water
 - b. Hydrogen ion gradient, hydrogen ion gradient
 - c. Splitting of water, splitting of water
 - d. NADH, FADH_2
 - e. Glucose, light

fix answer *

↓ wavelength, ↑ energy

28. Cyclic electron flow differs from linear in that:
- Cyclic flow only produces NADPH
 - Linear flow only produces ATP
 - Cyclic flow only utilizes photosystem I
 - Cyclic flow uses a different type of chlorophyll a molecule
29. Why are C_4 plants more suited for hot, dry climates than C_3 plants?
- They do not close their stomata in hot, dry weather
 - They evolved in cold weather but migrated to the tropics, where they are now more suitable
 - They suspend photosynthesis in the heat
 - They keep fixing carbon dioxide even when the concentration of carbon dioxide in the leaf is low
30. A pair of sister chromatids represents:
- Two chromosomes
 - Two copies of the same DNA
 - Two copies of different DNA
 - One copy of the entire genetic code
31. You are staining cells in various stages of the cell cycle. You notice that one cell has a much darker, denser area than the rest of the cells. What part of the cycle is this cell in?
- G_1
 - S
 - G_2
 - G_0
32. A mutant liver cell begins mitosis with 14 chromosomes. How many sister chromatids will be present during metaphase? *28 sister chromatids = 14 pairs*
- 28
 - 14
 - 7
 - 21
33. Which phase of mitosis is characterized by "v" shaped chromosomes?
- Prophase
 - Metaphase
 - Anaphase
 - Telophase
 - Interphase
34. Which of the following does not occur during mitosis? *interphase*
- Replication of chromosomes
 - Migration of chromosomes to opposite poles
 - Separation of chromatids
 - Alignment of chromosomes along the cells equator
35. Under the microscope you observe a cell (of unknown type) undergoing mitosis. You see vesicles forming between the two cells. Which type of cell is this? *cytokinesis*
- Animal Cell
 - Bacterial Cell
 - Viral Cell
 - Plant Cell

- e. You cannot determine the cell's identity from the information provided
36. What consequence would the cell have if the concentration of cyclin was greatly decreased after the G₂ checkpoint?
- The cell could not enter mitosis
 - The cell would enter G₀ phase
 - The cell would be stopped after the S phase
 - There would be no consequence
- only need cyclin to build up so it can bind w/ cdk to pass b₂ ✓ print*
37. Which would you expect to see more of during the G₁ phase?
- Chromatin
 - Cdk *bc it is recycled*
 - Cyclin
 - MPF
38. What could be a potential effect of exposing healthy cells to radiation? → *CANCER cells lack density dependent inhibition*
- The cells would proliferate at an exponential rate
 - The cells would undergo apoptosis
 - The cells would divide, forming several layers
 - There would be no effect
39. Under what circumstances would crossing over occur, but not contribute to genetic diversity?
- If the cell has too many chromosomes
 - If the cell has too few chromosomes
 - If the cell is a gamete
 - If the cell is a somatic cell
 - If all of the chromosome pairs have identical alleles
40. If a human cell has 22 autosomes and an X chromosome, it must be:
- An egg cell
 - A sperm cell
 - A zygote
 - A & B
 - A & C
41. When do homologous chromosomes separate?
- Prophase I
 - Prophase II
 - Anaphase I
 - Anaphase II
 - Telophase I
- *42. T/F: At the end of meiosis I, the cell is haploid
43. A chiasmata can be observed:
- During the S phase of interphase
 - Metaphase I
 - Metaphase II
 - Prophase I
 - The chiasmata occurs during mitosis
44. After meiosis, how do cells regain their diploid number of chromosomes?
- Cells undergo S phase without cellular division
 - Cells undergo mitosis without cytokinesis
 - Fertilization combines two haploid cells

- d. They don't
 - e. They undergo G_0 phase long enough to gain back the missing chromosomes
45. If the DNA content of a diploid cell during G_1 phase is X , what is the DNA content of the cell during metaphase I?
- a. $4X$
 - b. $2X$
 - c. X
 - d. $0.5X$
 - e. $0.25X$
46. How many chromatids make up homologous chromosomes?
- a. 1
 - b. 2
 - c. 3
 - d. 4
 - e. 8
- 2 chromatids/chromosome*
- ~~47.~~ 47. What do you have at the end of Meiosis I?
- a. 2 haploid cells
 - b. 4 haploid cells
 - c. 2 diploid cells
 - d. 4 diploid cells
 - e. 1 diploid and 1 haploid cell
48. In Meiosis, how many of the daughter cells are identical to the parent cell?
- a. 4
 - b. 2
 - c. 1
 - d. 0
49. Meiosis occurs in:
- a. Egg cells
 - b. Gametes
 - c. Sperm Cells
 - d. Somatic Cells
50. T/F A gamete may undergo Meiosis twice

