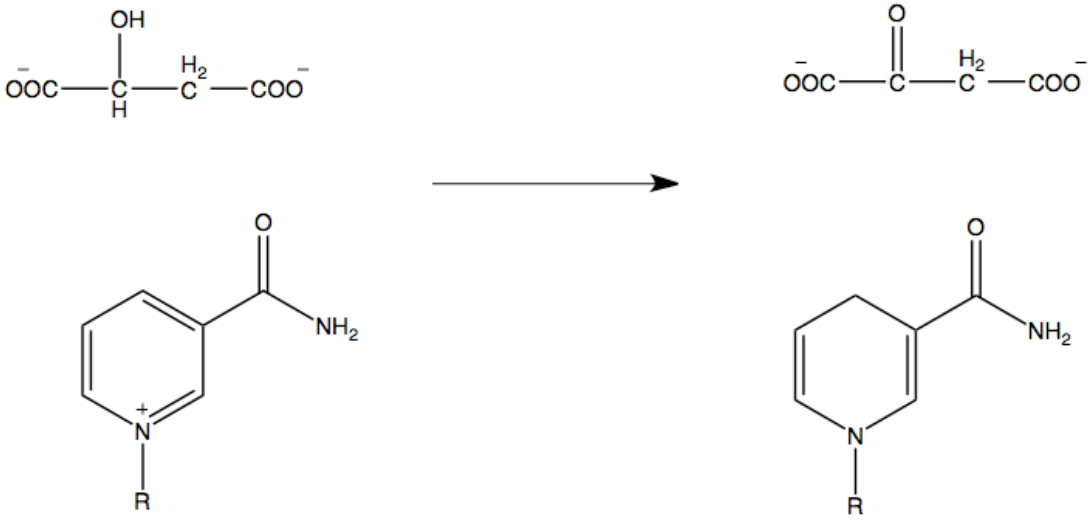
Exam I

Name: _____

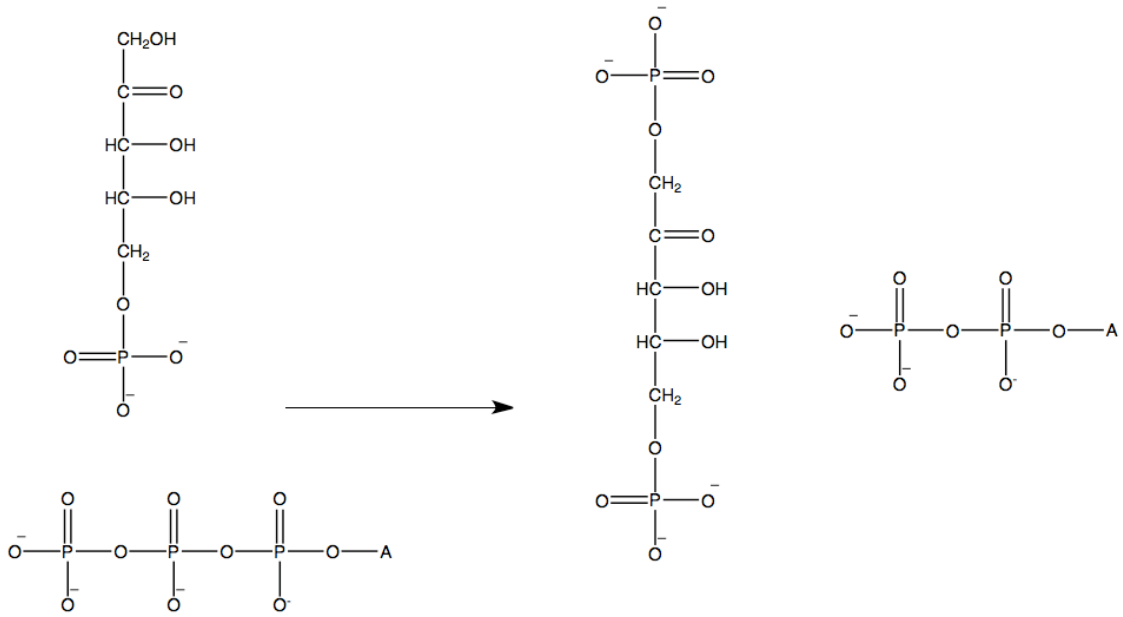
1.) **For each of the following reactions, predict the enzyme class (i.e. mutase). Below each reaction draw out an additional example from reactions that we have studied thus far that utilizes the same enzyme class. Include chemical structures and names of all reactants, products, and enzymes in your example.**

a.(10 pts) Enzyme class _____



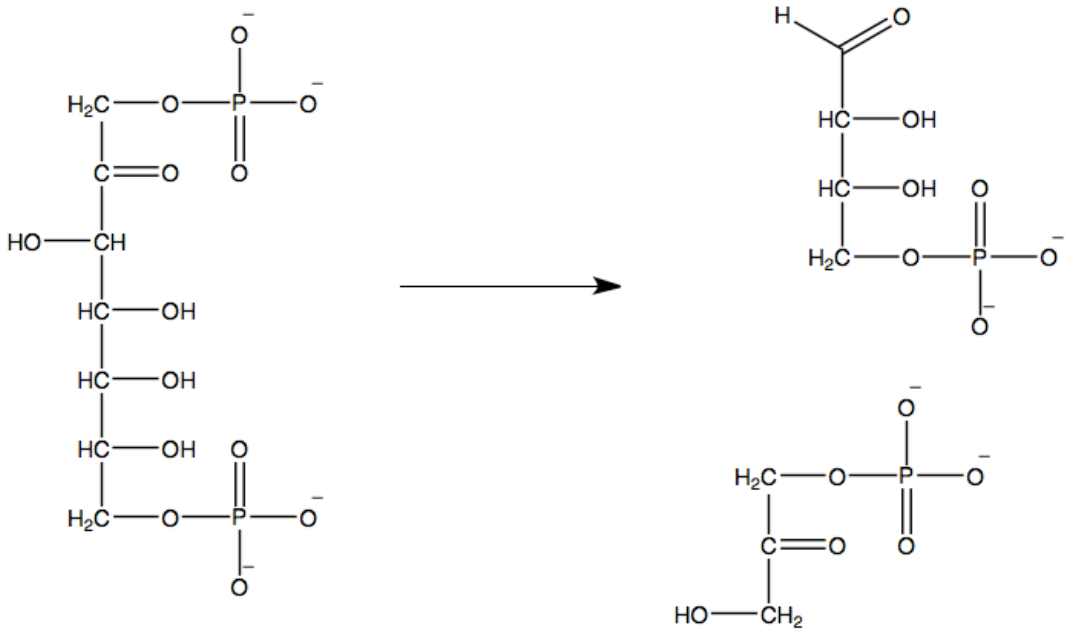
Example:

b.(10 pts) Enzyme class _____



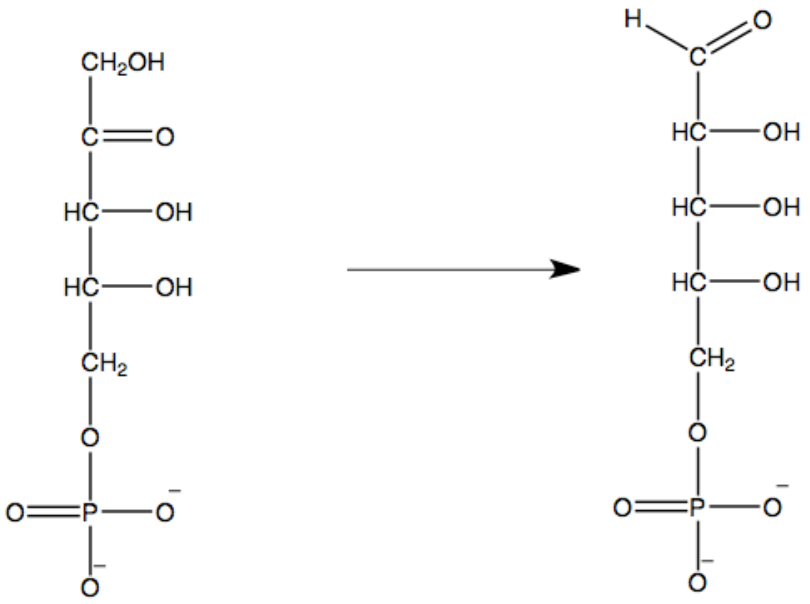
Example:

c.(10 pts) Enzyme class _____



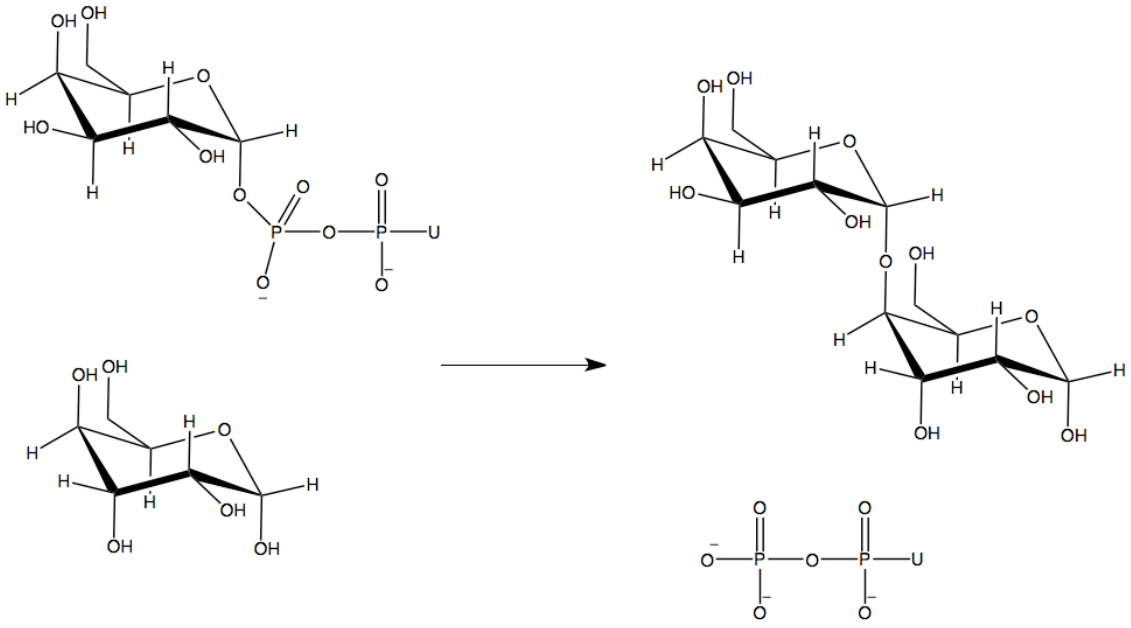
Example:

d.(10 pts) Enzyme class _____



Example:

e.(10 pts) Enzyme class _____



Example:

f.(10 pts) Enzyme class _____

Example:

2a. (6 pts) Fill in the blanks in the following table, which describes how to make serial dilutions. Each tube should have 1 mL after mixing.

Tube	Component 1	Component 2 (dH_2O)	Dilution Factor
1	stock solution	0.0 uL	1
2	500 uL tube #1	500 uL	_____
3	200 uL tube #2	_____	1: 10
4	100 uL tube #3	900 uL	_____

2b. (4 pts) If the solution in tube #4 has an absorbance of 0.47 at 540 nm, what is the absorbance of the stock solution?

3. (10 pts) Circle the correct state for each of following during FASTING in a hepatocyte (liver cell).

a.) Insulin bound -or- Glucagon bound

b.) [cAMP] increases -or- [cAMP] decreases

c.) Protein kinase A ↑ -or- Protein kinase A ↓

d.) Glycogen phosphorylase ↑ -or- Glycogen phosphorylase ↓

e.) Glycogen synthase ↑ -or- Glycogen synthase ↓

4. (10 pts)

i. $S + 2H^+ + 2e^- \rightarrow H_2S$ $E°'=-0.23$ V

ii. Fumerate $+ 2H^+ + 2e^- \rightarrow$ Succinate $E°'=0.031$ V

a.) Write out the NET equation which couples the half reactions i and ii to give the MOST positive $\Delta E°'$.

b.) What is the standard Gibbs Free energy change for this net reaction? ($F=23{,}060$ cal V^{-1} mol^{-1})

c.) If the overall Gibbs Free energy change for this reaction is -20.6 kcal mol^{-1}, what is the ratio of products to reactants?

5. (10 pts) Fill in the enzyme which catalyzes each reaction. Circle the ATP generating reactions. Place a star next to the redox reactions.

a.) Glucose to Glucose-6-phosphate:_____

b.) Glucose-6-phosphate to Fuctose-6-phosphate:_____

c.) Fructose-6-phosphate to Fructose-1,6-bisphosphate:
_____

d.) Fructose-1,6-bisphosphate to glyceraldehde-3-phosphate and dihydroxyacetone phosphate:_____

e.) Dihydroxyacetone phosphate to glyceraldehyde-3-phosphate:
_____

f.) Glyceraldehyde-3-phosphate to 1,3-bisphosphoglycerate:
_____

g.) 1,3-bisphosphoglycerate to 3-phosphoglycerate:_____

h.) 3-phosphoglycerate to 2-phosphoglycerate:_____

i.) 2-phosphoglycerate to phosphoenolpyruvate:_____

j.) phosphoenolpyruvate to pyruvate:_____