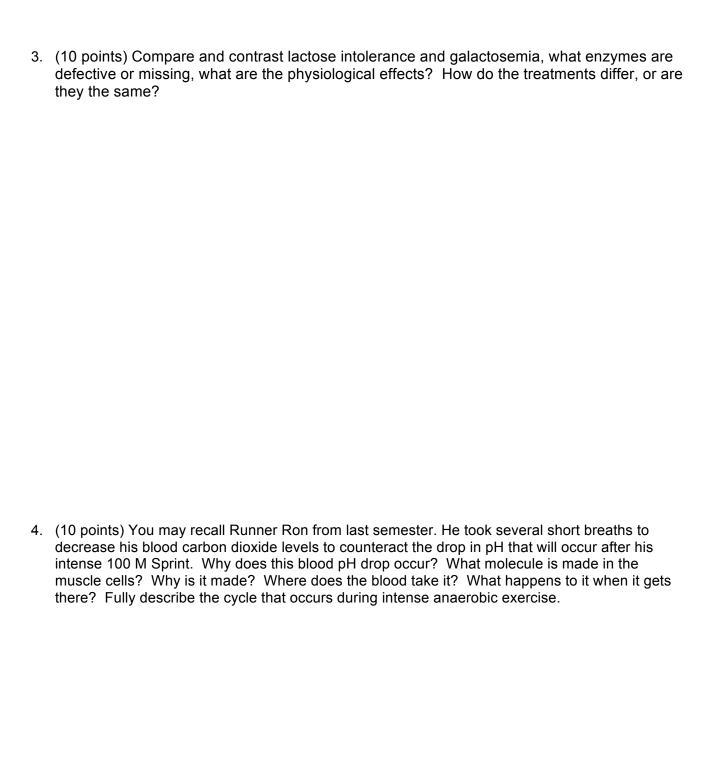
Biochemistry II, CHEM 4420 Exam III, Spring	3 Dr. Stone Name
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<u>Use complete sentences or complete structures when needed</u>. There are seven questions on six pages. The points are indicated for each question.

1. (20 points) Draw all of the structures for glycolysis and gluconeogenesis, include all of the enzymes, cofactors and all reactants for each reaction.

2.	(15 points) Which reactions in glycolysis are controlled by regulatory enzymes? enzymes regulated?	How are these



5.	(15 points) Draw all of the reactions for the TCA cycle (Citric Acid Cycle). structures, enzymes and co-factors.	Include all of the

6. (15 points) There were six presentations on drugs that treat diabetes or cancer by targeting glucose metabolism. Match each drug with its mechanism of action, then describe one mechanism in detail.

<u>Drugs:</u> <u>Mechanisms:</u>

Actos 1. Agonist for PPARγ

Canagliflozin

2. Triggers the release of insulin and decreases glucagon secretion
Exenatide

3. Blocks GLUT1, a transporter that is elevated in cancer cells

Metformin. 4. Inhibits α amylase in the intestine STF-31 5. Activates AMP kinase (AMPK)

Voglibose 6. Inhibits SGLT2

Drug selected for detailed	description
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7. (30 points) A 40 year old female (113 kg, 160 cm) had been experiencing extreme thirst. She also experienced the stress of not going to Hawaii and had to eat an entire box of chocolate covered macademia nuts to ease this stress. To wash down the chocolate yummies, she consumed a 24 pack of Gatorade in three days. On her way to Costco to replenish her Gatorade, she became nauseous and could not catch her breath. (She thought it was due the excitement of going to Costco). While she was shopping, she lost consciousness and was then transported to the ER. In the ER, it was noticed that her breath smelled fruity. Blood tests were done and her insulin level was very elevated. What would you expect for the following molecules?

Molecule	High or low relative to normal	Reason(s)
Glucose		
Free fatty acids		
Ketone bodies		

Free fatty acids			
Ketone bodies			
		on the following tissues and pathways? nism that has been affected.	For each pathway, give at
Adipose: Glycolysis			
Fatty acid s	synthesis		
Muscle: Glycolysis			
Fatty acid s	synthesis		
Glycogen s	ynthesis		
<u>Liver:</u> Glycolysis			
Gluconeogo	enesis		
Glycogen s	ynthesis		
Fatty acid s	synthesis		

Pentose phosphate pathway