

King Saud University
College of Science
Department of Biochemistry



BCH 347 – Metabolism
First Continuous Exam
Second Semester 1430-1431H

TIME: 1hrs.

Student name: _____

Student number: _____
no: _____

Serial

<u>Marks</u>	
Section I	/5
Section II.....	/9
Section III.....	/11
Total.....	/25

With My Best Wishes

Section I

Answer the following as true [T] or false [F].

- 1- Pancreatic enzymes include several disaccharidases. []
- 2- For each acetyl CoA entering the Krebs cycle, 24 high-energy phosphate bonds are produced []
- 3- The cleavage of the high-energy bond of ATP into ADP and Pi is an example of oxidation-reduction reaction []
- 4- The first substrate level phosphorylation in glycolysis is reversible []
- 5- The enzymes of glycolysis are located in the mitochondria []
- 6- Insulin is not required for the uptake of glucose by the intestinal cells []
- 7- Passive transport is much more faster than active transport. []
- 8- GLUT-2 is a sodium-independent facilitative transporter []
- 9- In most cells 2,3 bisphosphoglycerate is present in high amount. []
- 10- In liver, glucose and fructose are converted to galactose. []

Section II

Each statement is followed by four related statement. Write T for correct statement and F for incorrect:

1- Lactose from the diet is hydrolyzed:

- a- by the enzyme lactase. []
- b- in the intestine. []
- c- in the brush border of intestinal mucosal cells. []
- d- to galactose and glucose, which are transported to the liver via the portal vein. []

2- NAD^+ used in glycolysis must be regenerated in order for glycolysis to continue

- a. to regenerate reducing equivalents for pyruvate dehydrogenase. []
- b. to provide a cofactor for hexokinase. []
- c. to allow glyceraldehydes-3-P dehydrogenase reaction to occur. []
- d. because it is needed to metabolize pyruvate to acetaldehyde . []

3- In aerobic glycolysis:

- a. The pathway is activated by three regulated steps. []
- b. The pathway is in the cytosol of every cell []
- c. The pathway produces lactate and NAD^+ []
- d. The pathway begins with glucokinase or hexokinase. []

4- Lactate dehydrogenase reaction:

- a. The enzyme converts pyruvate to lactate []
- b. The enzyme converts NADH to NAD^+ []
- c. Is the last reaction in anaerobic glycolysis []
- d. The enzyme is found in liver but not in muscle []

5- Pyruvate dehydrogenase complex:

- a. is activated by phosphorylation. []
- b. is allosterically inhibited by acetyl CoA. []
- c. requires lipoic acid as cofactor. []
- d. Inhibited by insulin. []

6-The enzymes of the citric acid cycle:

- a. FAD is the coenzyme of succinate dehydrogenase. []
- b. Isocitrate dehydrogenase is activated by calcium ions. []
- c. Malonic acid is competitive inhibitor of malate dehydrogenase. []
- d. Are located in the cytosol. []

7- In the citric acid cycle, a substrate level phosphorylation is catalyzed by:

- a. Citrate synthase []
- b. Succinyl CoA synthetase []
- c. Fumarase []
- d. Isocitrate dehydrogenase []

8-The enzyme complex in the TCA cycle which produces NADH

- a. Citrate synthase []
- b. α -ketoglutarate dehydrogenase []
- c. Succinyl-CoA synthetase (succinate thiokinase) []
- d. Malate dehydrogenase []

9-In glycolysis

- a. Aldolase catalyzes conversion of triose phosphate. []
- b. Glyceraldehyde 3- P dehydrogenase catalyzes the first oxidation reaction. []
- c. Pyruvate kinase catalyzes reversible reaction. []
- d. Phosphoglycerate mutase catalyzes conversion of 2-phosphoglycerate to phosphoenolpyruvate []

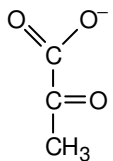
Section III

A- Matching each phrase on the right with a term on the left.

A. Insulin	___ 1. is inhibited by iodoacetate
B. ATP	___ 2. inhibits enolase
C. 2,3 bisphosphoglycerate	___ 3. stimulates pyruvate dehydrogenase reaction
D. Ethanol	___ 4. most important phosphate compound in metabolism
E. Fructose2, 6 bisphosphate	___ 5. has Low affinity to glucose
F. Glucokinase	___ 6. end product of glycolysis in yeast
G. Hexokinase	___ 7. decreases the affinity of Hemoglobin to O ₂ .
H. Fluoride	___ 8. inhibited by glucose-6-P
I. Glyceraldehyde-3-P Dehydrogenase	___ 9. allosteric activator of PFK-1
K. Arsenate	___ 10. inhibit Pyruvate dehydrogenase and α -ketoglutarate dehydrogenase complex

B- Answer the following questions

- 1- Calculate how many molecules of CO₂ will be given off if you supply an aerobic cell with five molecules of the following molecule



- 2- Calculate how many molecules of ATP produced from one molecule of glucose in a cell lacking electron transport system

3- Draw the curves that show the activity of PFK-1 in the presence of high or low [ATP]. Explain

C- Fill the gap with appropriate statement:

a- The diagram below represent:.....

b- Fill the gap with appropriate statement.

