

**King Saud University,
College of Science, Biochemistry Department
2nd Continuous Exam,
2nd Semester 1430 H – 31H
Metabolism-1 - 347 BCH**



Name: _____

Number: _____

Q I: _____ / 5

Q II: _____ / 10

Q III: _____ / 5

Q IV: _____ / 5

Total Marks: _____ / 25

Q I: Answer the following as true [T] or false [F]

1. Insulin inhibits gluconeogenesis through the production of fructose-2,6-bisphosphate. []
2. Glycerol can not be utilized in adipose tissue due to absence of glycerol kinase enzyme. []
3. Lactate can be converted to glucose by gluconeogenic pathway (Cori-cycle). []
4. The oxidative phase of PPP produces ribose-5 P. []
5. Oligomycin blocks the proton flow through F₀ and F₁ ATP Synthase. []
6. Decrease NADPH/NADP ratio inhibits glucose-6-phosphate dehydrogenase reaction in PPP. []
7. Fasting increasing the rate of glucose oxidation by PPP. []
8. Phosphoenolpyruvate carboxykinase (PEPC) is one of the cytoplasmic key enzymes of gluconeogenesis. []
9. Each turn of glyoxylate cycle consumes 2 molecules of acetyl CoA cycle and produces 2 molecules of CO₂. []
10. Complex III of respiratory chain is coupled with the transfer of protons from the intermembrane space to the matrix. []

QII: Choose only one answer (the best suitable one):

1- In the electron transport chain, inhibitor of complex IV (cytochrome oxidase)

- a) Rotenone.
- b) Cyanide.
- c) Antimycin A.
- d) Oligomycin.

2- Each of the following enzymes is required for the conversion of glycerol to glucose EXCEPT:-

- a) Glucose-6-phosphatase
- b) Glycerol-3-phosphate dehydrogenase
- c) Phosphoenol pyruvate carboxykinase
- d) Fructose 1.6 bisphosphatase

3- The activity of which of the following enzymes would be decreased by thiamine deficiency:

- a) Glucose-6-phosphate dehydrogenase.
- b) Transaldolase.
- c) Ketoisomerase.
- d) Transketolase.

4- In pentose phosphate pathway, transaldolase removes 3 carbon atoms from seduheptulose-7-phosphate and attaches them to:

- a) Glyceraldehyde-3-phosphate.
- b) Erythrose.
- c) Fructose-6-phosphate.
- d) Xylulose-5-phosphate.

5- Allosterically stimulates pyruvate carboxylase in gluconeogenesis is:

- a) Excess acetyl Co A.
- b) Biotin.
- c) Excess ATP.
- d) Excess citrate.

6- All the following about pentose phosphate path way are true EXCEPT:-

- a) There is a net energy production of 8 ATP molecule.
- b) NADPH+H is produced that is essential for lipids metabolism.
- c) Deficiency of glucose -6- phosphate dehydrogenase leads to favism
- d) It consists of 2 phases; oxidative and non-oxidative phases.

7-IN which compartment does pentose phosphate pathway occurs?

- a) The mitochondria
- b) The cytosol
- c) Both of them
- d) None of them

8- NADPH + H is produced by:

- a) Pentose phosphate pathway
- b) Gluconeogenesis
- c) Respiratory chain
- d) Glyoxylate pathway

9-which of the following enzymes of glycolysis is utilized in gluconeogenesis:

- a) Glukokinase
- b) Aldolase
- c) Phosphpfructokinase
- d) Pyruvate kinase

10-gluconeogenesis occurs:

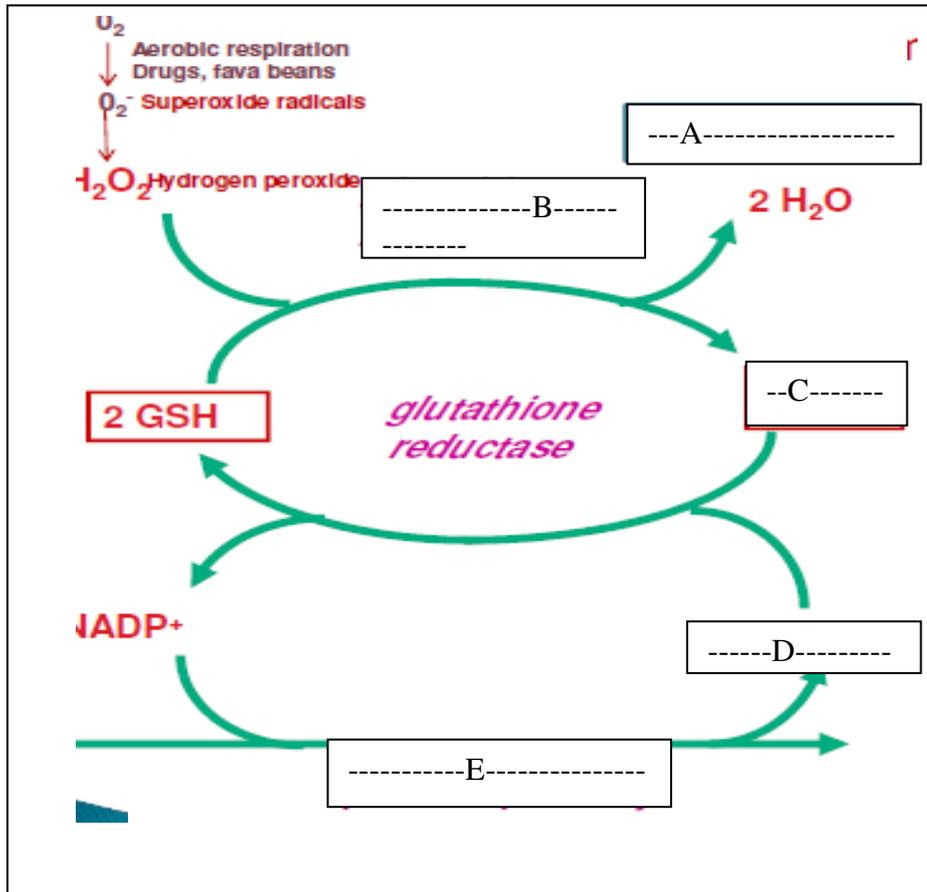
- a) Mitochondria
- b) Cytosol
- c) Both of them
- d) None of them

QIII: Match each statement from column A with the suitable one from column B:

	A	B
1	Complex II of respiratory chain	----- the Pentose Phosphate Pathway
2	proton gradient	----- unique to glyoxylate cycle
3	G6PD the committed step in	----- need vitamin B₁₂ as cofactor
4	Glucagon	----- Succinate dehydrogenase
5	methylmalonyl-CoA mutase	----- Common to TCA cycle and glyoxylate cycle
6	Complex IV of respiratory chain	----- lipid soluble component of respiratory chain
7	Malate synthase	----- power ATP synthesis
8	4 high energy bonds	----- induces gluconeogenic enzymes
9	Malate dehydrogenase	----- needed to convert 2 molecules of pyruvate to 2 molecules of PEP
10	Coenzyme Q	----- Contains cytochromes a/a₃ and 2 Cu⁺ ions

Q IV: Answer the following questions:

1-On the basis of the importance of PPP in RBC, label this figure;



A The process is called-----

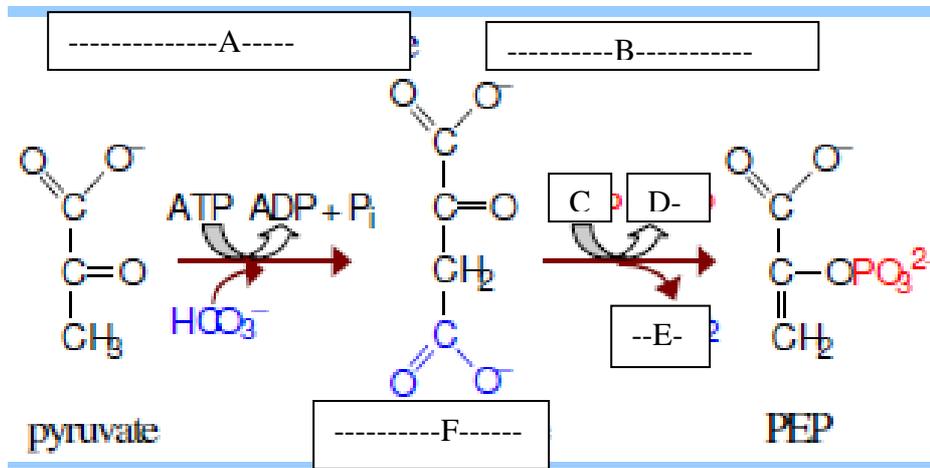
B Enzyme -----

C Chemical compound -----

D Coenzyme -----

E Pathway -----

2- In Gluconeogenesis PK is bypassed by two reactions, on the basis of this statement label this figure:



A Enzyme 1-----

B Enzyme 2 -----

C Cofactor -----

D product 1 -----

E Product 2 -----

F chemical compound -----

