King Saud University,
College of Science, Biochemistry Department
2nd Continuous Exam,
2nd Semester 1428 H – 29H
Metabolism-1 - 347 BCH

Name: _____

Number: _____

Q I: _____ / 5

Q II: _____ /10

Q III: _____ / 5

Total Marks: _____ /20

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

1. The major site of gluconeogenesis is the kidney. [ ]

2. Glycerol can not be utilized in adipose tissue due to absence of glycerol kinase enzyme. [ ]

3. Oxidation of Co QH_2 by cytochrome C is the function of complex IV of the electron transport chain . [ ]

4. Pentose phosphate pathway is active in the cytosol of the adipose tissue. [ ]

5. AMP stimulates glycogen phosphorylase in muscles. [ ]

6. Insulin dephosphorylate and inactivate glycogen synthase. [ ]

7. In glycogenolysis,glucose-1-phosphate is released from the branch points.[ ]

8. 2,4 dinitrophenol increases the permeability of the inner mitochondrial membrane

to protons so uncouple oxidative phosphorylation . [ ]

9. Synthesis of UDP-glucuronate from UDP-glucose needs NADPH as

coenzyme. [ ]

10. Glycogen synthase catalyze the transfere of glucose units from UDP-glucose to

glycogen primer up to a minimum length of 4 glucose residues. [ ]

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

1- Muscle glycogen can not release glucose into blood because:

a) Muscle plasma membrane contains no glucose transporters.
b) Muscle contains no glucose -6-phosphatase.
c) Muscle contains no α-1,6 glucosidase.
d) Muscle contains no phosphoglucomutase.

2-In the electron transport chain, inhibitor of electron transfer from cytochrome b to cytochrome C1 is:

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

3- In pentose phosphate pathway, glucose-6-phosphate dehydrogenase is:

a) Inhibited by NADH.
b) Activated by fructose 2,6 bisphosphate.
c) Activated by AMP.
d) Inhibited by NADPH.

4- The main source of glucose after 18 hours fasting is:

a) Glycerol.
b) proteins.
c) Propionyl Co A.
d) Lactate.

5- In glycogensis , enzyme catalyzes transfer of 6 glucose residues from one branch to be linked to the nearest branch is :

a) Glycogen synthase.
b) Amlyo 1,6 glucosidase.
c) Amlyo (1,4→ 1,6) transglucosidase.
d) α 1,4 → α 1,4 glucanotransferase.

6- The activity of which of the following enzymes would be decreased by thiamine deficincy:

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

7- During synthesis of glucose from 2 molecules of pyruvate----------high energy phosphate bonds are utilized:

a) 4.
b) 6.
c) 8.
d) 2.

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

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

9- Which of the following reaction is unique to gluconeogenesis:

a) Phosphoenolpyruvate ⟶ pyruvate.
b) Lactate ⟶ pyruvate.
c) Oxaloacetate ⟶ Phosphoenolpyruvate.
d) Fructose-6-phosphate ⟶ fructose1,6 bisphosphate.

10- Allosteric activator of pyruvate carboxylase in gluconeogenesis is:

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

Q III: Answer the following questions:

1-Draw a diagram to show dicarboxylic acid shuttle in gluconeogenesis?

2 - **Complete the following with appropriate answers:**

a) The end product of the irreversible oxidative phase of PPP is (a)? Can be converted to either (b or c) in the non oxidative phase of PPP by the enzymes (d & d)?

a)_____ b)_____ c)_____

d)_____ e)_____

b) Favism is an inherited hemolytic anemia due to deficiency of(a)? And is precipitated by(b)?

a)_____

b) 1_____

2_____

3_____

c) Product of glyoxylate cycle that enters the TCA cycle ?

_____

d) Name 2 enzymes common to both glyoxylate and TCA cycle?

_____ _____

Name 2 enzymes unique to glyoxylate cycle?

_____ _____