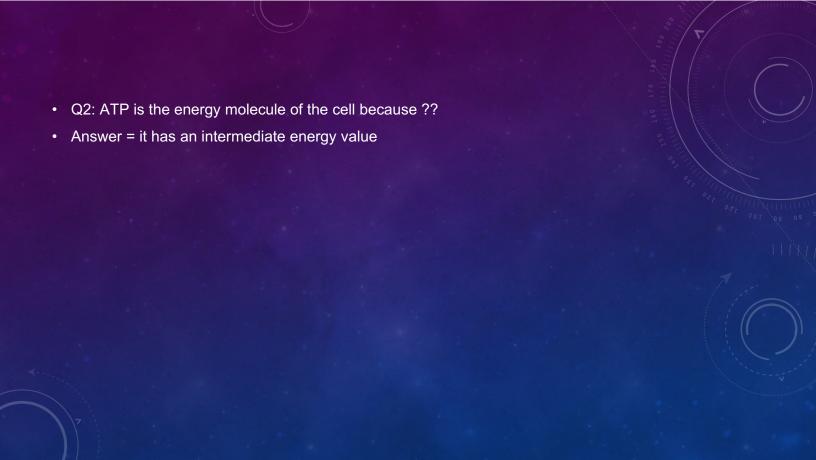
METABOLISM: WEAK 1 PAST PAPER

• Q1 : What is the standard free energy of the reaction if / delta E°=-10 mvolt, 2 electron transported, Faraday constant=23 Kcal/volt??

• Answer = 0.46kcal



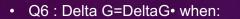
- Q3: Measure the change in the disorder of reactants and products is?
 A-Delta G
 B-Delta H
- D-Delta T

C-Delta S

Answer:C

- Q4 :Which of the following that predict whether reactions is spontaneous or not:
- · A-Delta G note
- B-DeltaG
- C-Delta H
- D-Delta E
- E-Delta E note
- Answer:B

- Q5 :Delta G represents energy changes at constant temperature ,pressure and proton concentration:
- A-True
- B-False
- Answer: B



- A-R=0
- B-[reactant]=0
- C-BI[A]=0
- D-In[BIA]=1
- E-(B|A]=1
- Answer:E

- Q7 : Which of the following pair is NOT true:
- A-positive delta G->endergonic
- B-negative delta G->exergonic
- C-Delta G=Zero-->equilibrium and concentration ([A]=[B]) are equals
- D-Delta G=don't measure fast of reaction
- Answer:C



Metabolism : Weak 2 Past papers —> Krebs Cycle & Oxidative phos

Collected by: AbdulRahman Ghanem

- which enzyme would be impaired in case of Biotin deficiency?
- A) Fructose 1,6-phosphatase
- B) Pyruvate kinase
- C) PEP carboxykinase
- D) Pyruvate carboxylase
- E) Malate dehydrogenase
- Answer: D

- One of the protein complexes of electron transport chain does not span the inner mitochondrial membrane:
- a- NADH dehydrogenase
- b- Cytochrome C reductase
- c- Coq-Cytochrome C dehydrogenase
- d- Succinate dehydrogenase
- Answer: D

- Dinitrophenol was a drug used for weight loss, which of the following molecules does it resemble the most?
- A-Thermogenin
- b-Rotenone
- c-Antimycin
- d-CO
- Answer : A

- A scientist made an experiment on mitochondria, he added antimycin, and then added an acid that lowered the PH. What is expected to happen?
- · a-ATP synthesis will be observed
- b-Electrons from FADH2 will reach oxygen
- c-Cytochrome a3 will be in the reduced form
- d-Oxidation of NADH will continue
- Answer: A

- Which of the following is correct regarding Oligomysin?
- a-It permits H+ transport through mitochondrial membrane
- b-lt binds to complex 2 of the electron transport chain
- c-It binds to the catalytic subunit of ATP synthase without inhibiting the transfer of electrons
- d-It inhibits ATP synthesis and the oxidation of NADH
- Answer: D

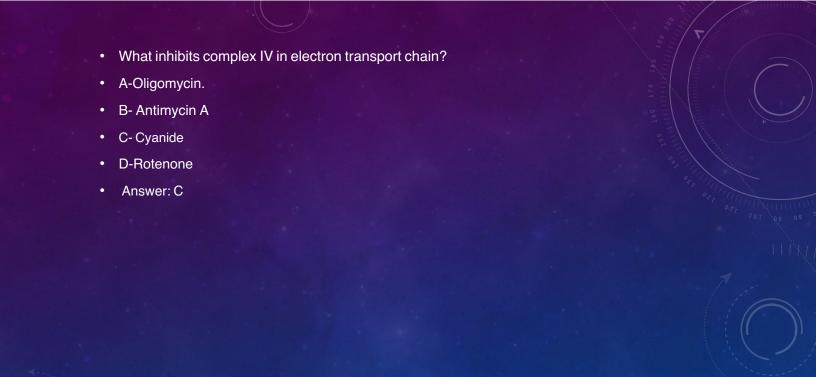
- Which of the following is true about CoQ:
- a-lt is highly hydrophilic
- b-lt can accept one or two electrons
- c-It can move freely in the cytosol
- · d-All statements are true
- Answer : B

- GTP in citric acid cycle is produced by:
- a-Oxidative phosphorylation
- b-Substrate level phosphorylation
- c-Active phosphorylation
- d-Transfer of phosphate from ATP
- Answer: B

- What determines the rate of oxidative phosphorylation?
 a-Availability of NADH
 b-The type of tissue
- c-Availability of ADP
- d-None of the above
- Answer: C

- Which of the following is considered an inhibitor for both isocitrate dehydrogenase and α-ketoglutarate dehydrogenase?
- a-ATP
- b-NADH
- c-ADP
- d-A+B
- Answer: D

- True about ATP synthase :
- A-Fo domain composed of 1 subunit.
- B-F1 domain composed of 1 subunit.
- C-H+ passes through fo to the mitochondrialmatrix.
- Answer: C



- Wrong about ATP / ADP translocase:
- A-contain single nucleotide binding site
- B- exergonic process
- C- inhibition of it lead to inhibition of cellular respiration
- D- similar affinity to ADP and ATP
- Answer: B

Which of these structures is oxidized by FAD?
A-succinate
B-succinyl coA
C-malate
D-alpha-ketoglutarate

Answer: A

Which of the following structures is activated by ADP?
A-phosphofructokinase
B-isocitrate dehydrogenase
C-pyruvate dehydrogenase

Answer: B

- What is the true if glutamate undergo transamination then by the enzyme glutamatendehydrogenase?
- A-This require ATP
- B- require NADH
- C- net product is alpha ketoglutarate
- D- Net product is ammonia
- E- all of the above
- Answer: C

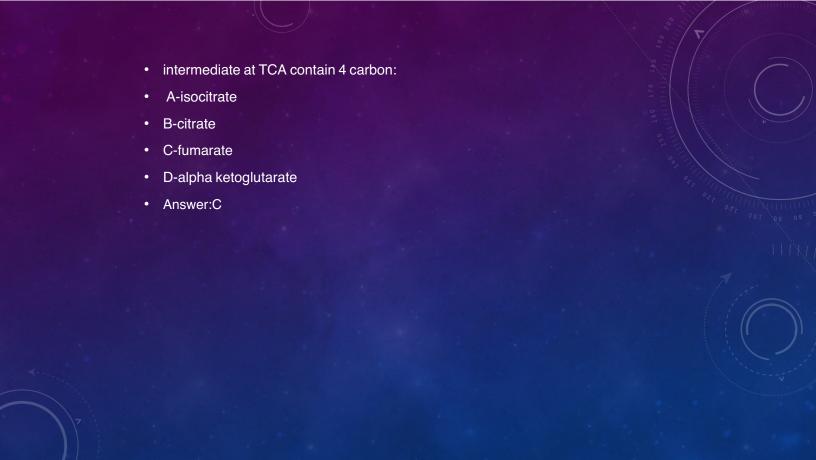
Which of the following doesn't contain iron sulfur center:
A-complex 1
B-complex 2
C-complex 3
D-complex 4

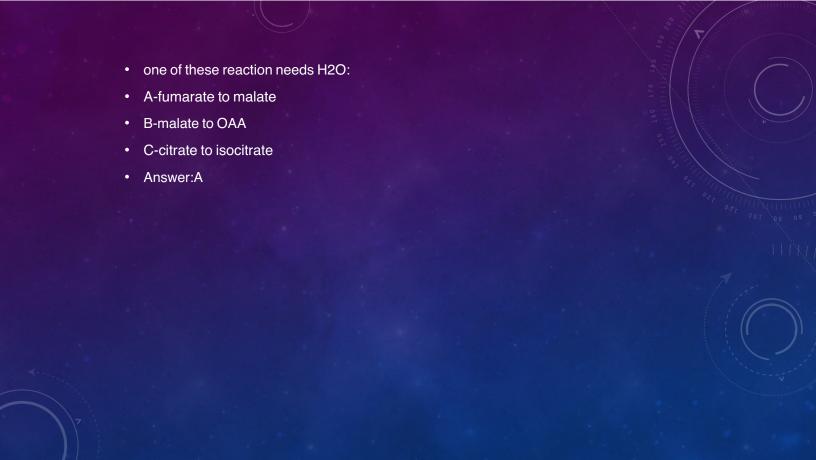
Answer:D

- Which of the following will cause the highest loss of energy at ATP production.
- A-CN
- B-CO
- C-N3
- D-Amytal
- E-Antimycin A
- Answer:D (it inhibits complex 1, which is the first pathway of ETC)

- which one of the following conditions decrease the oxidation of acetyl coA by the citric acid cycle:
- A-a high availability of calcium
- B-a high acetyl coA/ coA ratio
- C-a low ATP/ADP ratio
- D-a low NAD+/NADH ratio
- Answer :D

- which of the following does not included in TCA cycle:
- A-alpha ketoglutarate to succinyl coA
- B-pyruvate to acetyl coA
- C-succinate to fumarate
- D-malate to oxaloacetate
- Answer:B





- During electron transport, protons are pumped out of the mitochondrion ateach of the major sites except for:
- a) Complex I.
- b) Complex II.
- c) Complex III.
- d) Complex IV.
- e) Complex MIM
- Answer: B

- Release of CoA from specific compounds in the mitochondrial matrix aids directly in:
- a. Substrate level phosphorylation
- b. Oxaloacetateproduction
- c. Formation of NADH
- d. Formation of FADH2
- e. Release of CO2
- Answer: A (GTP = ATP)

- The complex in electron transport chain that DOES NOT have a direct link to coenzyme Q in some form is:
- a. Cytochrome c oxidase
- b. ComplexIII
- c. ComplexII
- d. Succinatedehydrogenase complex
- e. Complex I
- Answer: A

- Which of the following is TRUE considering TCA cycle?
- a. If citrate is very high in concentration, TCA cycle will run less effectively
- b. When oxidation occurs, an accompanying decarboxylation takes place
- c. The overall ΔG is considered zero at physiological conditions
- d. ADP is an allosteric activator for 2 of the three dehydrogenases included
- e. All enzymes are allocated within the mitochondrial matrix
- Answer: A

- The reactions in which succinate is converted to oxaloacetate are, in order:
- a. three successive oxidation reactions
- b. an oxidation, a hydration, and an oxidation
- · c. an oxidation, a dehydration, and an oxidation
- D. an oxidative decarboxylation, a dehydration, and a condensation
- E. a condensation, a dehydration, and an oxidative decarboxylation
- Answer: B

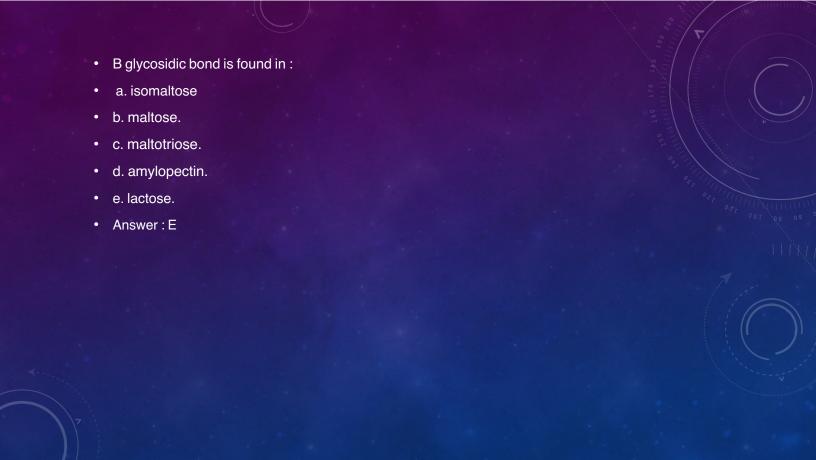
- Which statement is CORRECT considering ATP generation in the electron transport chain?
- a. Entry of protons occurs through the F0 piece into the mitochondrial matrix.
- B. The FO piece of the ATP synthase is composed of one subunit.
- C. The FI piece of the ATP synthase is composed of one subunit.
- d. The FO piece of the ATP synthase binds ADP and Pi tightly before ATP synthesis occurs.
- e. Conformational changes are minimal in the FO piece compared to the FI piece
- Answer: A

- During oxidative decarboxylation of a- ketogluterate, the following happens:
- a. Oxidation of an acetate group
- b. Addition of Coenzyme A to a 2-carbon fragment
- c. Oxidation of NADH
- D. Removal of 2 CO2 molecules
- e. Oxidation of 2 thiol groups by FAD
- Answer :E

- Uncoupling in mitochondria refers to:
- a. Stopping ATP synthesis but not stopping electron flow
- b. Increasing the pH value inside the mitochondrial matrix
- c. Blocking NADH electrons from entering the electron transport system
- d. Interruption of electron flow
- e.Stopping electron flow but not stopping ATP synthesis
- Answer: A

I APOLOGISE IF THERE IS ANY MISTAKE

- Metabolism :Weak 3 Past papers —> carbohydrates & Glycolysis
- Collected by : Abdulrahman Ghanem



- The products of glycolysis under aerobic conditions in the muscle are
- a. pyruvate, NADPH and ATP.
- b. lactate, NADH and ATP.
- c. lactate and ATP.
- d. pyruvate, NADH and ATP.
- e. lactate, NADPH and ATP.
- Answer: D

- The glucose transporter GLUT4
- a. is found in the pancreatic cells.
- b. is found in liver cells.
- c. can transport glucose against concentration gradient.
- d. isactuallyfructosetransporter.
- e. is insulin sensitive.
- Answer: E

- Glycolysis is inhibited by
- a. Hydrogenions.
- b. phosphorylation of glyceraldehyde 3- phosphate dehydrogenase.
- c. high ADP/ATP ratio.
- d. fructose2,6bisphosphate
- e. dephosphorylation of pyruvate kinase.
- Answer: A

- The most important controlled step in the glycolytic pathway is:
- A) the formation of fructose 1,6-bisphosphate by PFK1
- B) the formation of glucose 6-phosphate
- C) the formation of glyceraldehyde 3 phosphate
- D) the formation of phosphoenolpyruvate .
- Answer: A

- which of the following enzyme of glycolysis catalyze the reaction of phosphoenolpyruvate (PEP) to pyruvate while making one molecule of ATP in the process?
- A) enolase
- B)phosphoglycerate kinase
- C) pyruvate kinase
- D) aldolase
- Answer: C

- glycolysis will cease if:
- A) Phosphofructokinase is activated
- B) Mitochondria aren't present in the cell
- C) NADH is not oxidized
- Answer: C

- Which of the following enzymes of glycolysis is/are regulated?
 A) Glucokinase/hexokinase
- B) Aldolase
- C) Pyruvate kinase
- D) A AND C
- Answer: D

- The rate-limiting enzyme in glycolysis is:
 A) Hexokinase
 B) Glucokinase
 C) Phosphatase-1
- D) Phosphofructokinase-1
- E) Aldolase
- Answer: D

the enzyme that has low km and low Vmax for glucose is :
A) Hexokinase
B) Glucokinase
C) Phosphofructokinase-1
D) Aldolase

Answer: A

- under anaerobic conditions, skeletal muscle tissue may continue to generate ATP from glucose metabolism (via glycolysis), resulting in the conversion of glucose to:
- A) Acetyl-CoA
- B) Succinate
- C) Lactate
- D) Citrate
- E) Malonate
- Answer : C

- glucokinase, the liver enzyme has which of the following properties:
- A) A lower Km for glucose than hexokinase
- B) Can be inhibited by glucose6-phosphate
- C) A higher Km for glucose than hexokinase
- D) B+C
- Answer : C (inhibited by Fructose-6-phosphate)

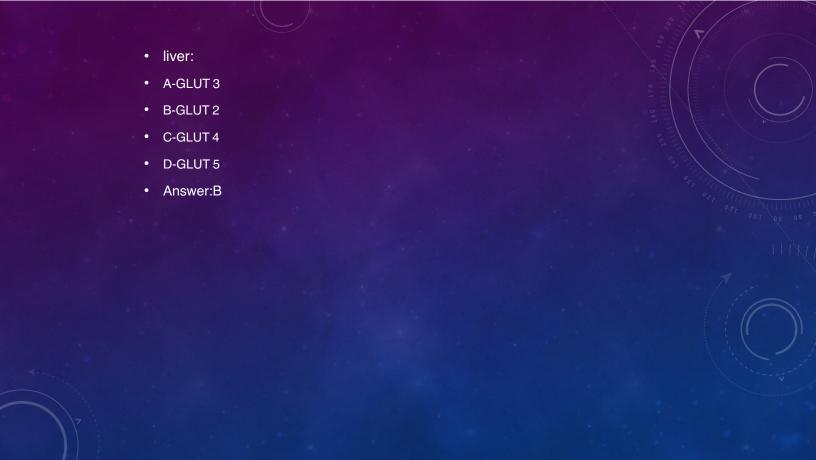
- Citrate is used as:
- a-PFK inhibitor
- b-PFK activator
- c-Hexokinase inhibitor
- d-Glucokinase inhibitor
- Answer: A

- • The beta type glycosidic bond connecting C1 to C4 is cleaved during digestion by
- a.Sucrase.
- b.Lactase.
- c.lsomaltase.
- d.Maltase.
- e.Sucrase/isomaltase.
- Answer: B

- Cleavage of fructose 1-phosphate will form:
- a-Glyceraldehyde and DHAP
- b-G3P and DHAP
- c-Dihydroxyacetone and G3P
- d-Dihydroxyacetone and Glyceraldehyde
- Answer: A

- The products of anaerobic glycolysis?
- A) 2 ATP, 2 acetyl coA, 2 CO2
- B) 2 ATP, 2 pyruvate, 2 NADH
- C) 2 ATP, 2 ethanol, 2 CO2
- D) 2 ATP, 2 lactate
- Answer: D

- Isomaltase is a _____ enzyme that is used in the digestion of _____ bond:
- a. Mucosal cell-membrane bound, alpha 1,2
- b. Pancreatic, alpha 1,1
- c. Mucosal cell-membrane bound, beta 1,4
- d. Mucosal cell-membrane bound, alpha 1,6
- e. Pancreatic, alpha 1,4
- Answer: I guess D (according to it's bond type)



- What are the effects of increased concentration of citrate?
- a) Increases the inhibitory effect of ATP
- b) Decreases the inhibitory effect of ATP
- C) Increases the activity of ATP
- d) Increases the activity of AMP
- Answer: A

- The first step in glycolysis that uses lyase generates
 a) Two aldoses
 b) Two ketoses
- c) An aldose and a ketose
- d) Only a ketose
- Answer: C

- Which of the following are an example of epimers?
- a. glucose and galactose
- b. glucose and ribosec
- c. mannose and glucose
- D.glucose and sucrose
- e.a+c
- Answer: E

- The reaction that produces ATP in glycolysis is accompanied by production of
- A.glyceraldehyde 3-phosphate
- B.phosphoenolpyruvate
- C.3-phosphoglycerate
- D.dihydroxyacetone phosphate
- E.1,3 bisphosphoglycerate
- Answer: C

• $\alpha(1-4)$ bond is found in: • A. sucrose B. Maltose C. Lactose • D. Galactose Answer: B

- What is the net yield of NADH when 1 mole of glucose 6-phosphate isoxidized by aerobic glycolysis to yield pyruvate?
- A. 0 mole NADH
- B. 1 mole NADH
- C. 2 Mole NADH
- D. 3 mole NADH
- Answer: C

- All of the following can result in lactic acidosis EXCEPT:
- a. Respiratory failure associated with COVID19.
- b. Direct inhibition of oxidative phosphorylation
- c. Uncontrolled haemorrhage
- d. Reduced tricarboxylic acid cycle activity.
- e. Activated gluconeogenesis.
- Answer: E

