

Unit 13 - Week 11

Course outline

How does an NPTEL online course work?

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Week 11

- Lecture 23 : Bioenergetics - I
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- Lecture material of Week 11
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Week 11 Assignment 11

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2020-04-15, 23:59 IST.

- 1) Which of the following acts as a storage form of high energy phosphate? 1 point
- a) Glucose-6-phosphate
b) Phosphoenolpyruvate
c) Phosphagens
d) Glycerol phosphate
- a)
 b)
 c)
 d)
- No, the answer is incorrect.
Score: 0
Accepted Answers:
c)
- 2) What is the standard free energy change of ATP? 1 point
- a) Small and negative
b) Large and positive
c) Small and positive
d) Large and negative
- a)
 b)
 c)
 d)
- No, the answer is incorrect.
Score: 0
Accepted Answers:
d)
- 3) What is the relationship between ΔG and ΔG^0 ? 1 point
- a) $\Delta G = \Delta G^0 + RT \ln \left(\frac{[products]}{[reactants]} \right)$
b) $\Delta G = \Delta G^0 - RT \ln \left(\frac{[products]}{[reactants]} \right)$
c) $\Delta G = \Delta G^0 + RT \ln \left(\frac{[reactants]}{[products]} \right)$
d) $\Delta G = \Delta G^0 - RT \ln \left(\frac{[reactants]}{[products]} \right)$
- a)
 b)
 c)
 d)
- No, the answer is incorrect.
Score: 0
Accepted Answers:
a)
- 4) The biochemical reaction $A \rightleftharpoons B$ has a large and positive change in free-energy ($\Delta G \gg 1$) under physiological conditions; which of the following is the best estimate for the equilibrium constant K_{eq} ? 1 point
- a) $K_{eq} > 1$
b) $K_{eq} < 1$
c) $K_{eq} = 1$
d) $K_{eq} \gg 1$
- a)
 b)
 c)
 d)
- No, the answer is incorrect.
Score: 0
Accepted Answers:
b)
- 5) Which of the following is NOT a feature of complex IV? 1 point
- a) In order to generate two water molecules, complex IV must go through the catalytic cycle two times
b) For every electron passed to complex IV, two protons are consumed from the matrix (N) side
c) Cytochrome c is a one-electron donor
d) Copper is an essential metal for the reaction
- a)
 b)
 c)
 d)
- No, the answer is incorrect.
Score: 0
Accepted Answers:
a)
- 6) Which of the following is an inorganic substance that is tightly bound to enzymes and is required for their activity? 1 point
- a) Coenzymes
b) Prosthetic groups
c) NAD
d) Vitamins
- a)
 b)
 c)
 d)
- No, the answer is incorrect.
Score: 0
Accepted Answers:
b)
- 7) Biologically which of the following has the highest redox potential? 1 point
- a) Carbohydrates
b) Proteins
c) Oxygen
d) Lipids
- a)
 b)
 c)
 d)
- No, the answer is incorrect.
Score: 0
Accepted Answers:
c)
- 8) Metabolism is best defined as 1 point
- I. the breakdown of glucose with the release of energy
II. building nucleic acids with the input of energy
III. the breakdown of proteins into amino acids
- a) II and III
b) I and III
c) I and II
d) I, II and III
- a)
 b)
 c)
 d)
- No, the answer is incorrect.
Score: 0
Accepted Answers:
d)
- 9) An endergonic reaction : 1 point
- a) Requires energy overall
b) Releases energy overall
c) Proceeds spontaneously
d) Does not require any activation energy
- a)
 b)
 c)
 d)
- No, the answer is incorrect.
Score: 0
Accepted Answers:
a)
- 10) A hydrolase: 1 point
- a) joins two molecules together using energy from ATP
b) transfers part of one molecule to another molecule
c) splits a bond by adding a water molecule
d) removes a group from a molecule forming a double bond, or adds a group to double bond
- a)
 b)
 c)
 d)
- No, the answer is incorrect.
Score: 0
Accepted Answers:
c)
- 11) Which of the following electron carriers is not able to transfer one electron at a time? 1 point
- a) NADH
b) FMN
c) FAD
d) Ubiquinone
- a)
 b)
 c)
 d)
- No, the answer is incorrect.
Score: 0
Accepted Answers:
a)
- 12) Reduced QH₂ is not formed by which of the following? 1 point
- a) Complex I and NADH
b) Complex III and cytochrome c
c) Complex II and succinate
d) Oxidation of glycerol-3-phosphate
- a)
 b)
 c)
 d)
- No, the answer is incorrect.
Score: 0
Accepted Answers:
b)
- 13) If electron transfer in tightly coupled mitochondria is blocked (with antimycin A) between cytochrome b and cytochrome c, then 1 point
- a) ATP synthesis will continue, but P/O ratio will drop to one
b) electron transfer from NADH will cease, but O₂ uptake will continue
c) all ATP synthesis will stop
d) electron transfer from succinate to O₂ will continue unabated.
- a)
 b)
 c)
 d)
- No, the answer is incorrect.
Score: 0
Accepted Answers:
c)
- 14) When the ΔG^0 of the ATP synthesis reaction is measured on the surface of the ATP synthase enzyme, it is found to be close to zero. This is likely to be due to: 1 point
- a) a very low energy of activation
b) enzyme-induced oxyphosphate exchange
c) stabilization of ADP relative to ATP by enzyme binding
d) stabilization of ATP relative to ADP by enzyme binding
- a)
 b)
 c)
 d)
- No, the answer is incorrect.
Score: 0
Accepted Answers:
d)
- 15) The relative concentrations of ATP and ADP control the cellular rates of: 1 point
- I. glycolysis
II. oxidative phosphorylation
III. pyruvate oxidation
- a) II and III
b) I and III
c) I, II and III
d) I and II
- a)
 b)
 c)
 d)
- No, the answer is incorrect.
Score: 0
Accepted Answers:
c)