

- 1) The reactions of glycolysis occur in this eukaryotic cell compartment:**
  - a. Cytoplasm
  - b. Mitochondria
  - c. Nucleus
  - d. Both cytoplasm and mitochondria
  
- 2) The fate of pyruvate during glycolysis depends primarily on the availability of:**
  - a. NAD<sup>+</sup> to keep the pathway going
  - b. Molecular oxygen
  - c. ADP for conversion to ATP
  - d. Coenzyme A for further metabolism of pyruvate
  
- 3) Enzymes with the following name types are used in isomerization reaction:**
  - a. Dehydrogenase
  - b. Kinase
  - c. Mutase
  - d. Phosphatase
  
- 4) An enzyme that transfers a phosphate group from ATP to substrate is usually called:**
  - a. A kinase
  - b. An isomerase
  - c. A mutase
  - d. A dehydrogenase
  
- 5) Glycolysis :**
  - a. Does not require O<sub>2</sub> to generate energy
  - b. Requires O<sub>2</sub> to generate energy
  - c. Is inhibited by O<sub>2</sub>
  - d. Rate is increased in the presence of O<sub>2</sub>
  
- 6) The binding of glucose to hexokinase:**
  - a. Is an example of lock-and-key binding of a substrate to the active site of an enzyme
  - b. Involves large conformational changes in the enzyme
  - c. Differs from the binding of substrate to other kinases
  - d. Is not well characterized

**12)** The step that commits the cell to metabolize glucose is catalyzed by:

- a. Hexokinase
- b. Phosphoglucomutase
- c. Aldolase
- d. Phosphofructokinase

**13)** Glycolysis involves:

- a. 4 Irreversible steps
- b. 3 Irreversible steps
- c. 2 Irreversible steps
- d. 1 Irreversible step

**14)** Which of the following statements is CORRECT regarding phosphofructokinase

- a. It acts as a control point in glycolysis
- b. Exists in blood in 4 different isozyme forms
- c. Its activity increased in the presence of high concentration of ATP
- d. Its activity is not affected by the level of fructose-2,6-bisphosphate

**15)** The only enzymatic reaction of glycolysis that catalyzes a cleavage reaction is:

- a. Enolase
- b. Aldolase
- c. Triose phosphate isomerase
- d. Glycerophosphate-3-phosphate dehydrogenase

**16)** Cleavage of fructose-1,6-bisphosphate to give two 3-carbon fragments is catalyzed by:

- a. Aldolase
- b. Enolase
- c. Isomerase
- d. Dehydrogenase

**7) In glycolysis NADH is produced in an intermediate step, then its converted to NAD+ in association with:**

- a. Conversion of pyruvate to lactate
- b. Conversion of lactate to pyruvate
- c. Conversion of phosphoenolpyruvate to pyruvate
- d. Conversion of glyceraldehydes-3-phosphate to 1,3bisphosphoglycerate

**8) Which of the following enzymes catalyzes a control step in glycolysis?**

- a. Phosphofructokinase-1
- b. Phosphofructokinase-2
- c. Fructose-2,6-bisphosphatase
- d. Fructose-1,6-bisphosphatase

**9) The only reaction of glycolysis that produce NADH is catalyzed by:**

- a. Enolase
- b. Aldolase
- c. Triose phosphate isomerase
- d. Glyceraldehydes-3-phosphate dehydrogenase

**10) After a degradation of glucose through the glycolytic pathway, one mole of glucose will produce a net of:**

- a. Two ATP moles
- b. Four ATP moles
- c. Three moles of acetyl-CoA
- d. Three ATP moles

**11) In glycolysis NADH is produced in an intermediate step in association with:**

- a. Conversion of pyruvate to lactate
- b. Conversion of lactate to pyruvate
- c. Conversion of phosphoenolpyruvate to pyruvate
- d. Conversion of glyceraldehydes-3-phosphate to 1,3-bisphosphoglycerate

**17)** How many net ATP molecules are produced from the conversion of one molecules of glyceraldehydes-3-phosphate to pyruvate?

- a. 1 ATP
- b. 3 ATP
- c. 2 ATP
- d. 4 ATP

**18)** In human, pyruvate can be converted to:

- a. Acetyly-CoA only
- b. Lactate only
- c. Ethanol only
- d. Acteyle-CoA and lactate

**19)** Starting form glucose and UTP and ATP, how many high energy phosphate bonds are broken to add glucose to glycogen molecule?

- a. 1
- b. 2
- c. 3
- d. 4

**20)** Advantages that glycogen provides to muscle cells in which it is stored all the following EXCEPT:

- a. Its available for quick energy needs
- b. It requires no energy to metabolize glucose residues for metabolism
- c. It gives anaerobic metabolism a boost
- d. It draws more water into the cells than glucose would

**21)** Concentration of all of the following molecules directly regulates the activity of glycogen synthase EXCEPT:

- a. Glucose
- b. Glucose-6-phosphate
- c. AMP
- d. ATP

The reaction of Fructose 1,6 Bisphosphate to give glyceraldehyde 3-P and dihydroxyacetone phosphate is an example of

- a. a reverse aldol condensation
- b. Hydrolysis
- c. oxidation
- d. dehydration

20) Starting from Glucose-6-P, Glycolytic reaction will produce:

- a. 2 ATP, 2 NADH
- b. 3 ATP, 2 NADH
- c. 4 ATP, 2 NADH
- d. 2 ATP, 4 NADH

21) starting from Fructose 6-P, Glycolytic reactions will produce the net of:-

- a. 2 ATP, 2 NADH
- b. 3 ATP, 2 NADH
- c. 4 ATP, 2 NADH
- d. 2 ATP, 4 NADH

22) if the glycolytic reactions not coupled with ATP synthesis the overall  $\Delta G$  would be:-

- a. more negative
- b. less negative
- c. more positive
- d. less positive

1 → A

2 → B

3 → C

4 → A

5 → A

6 → B

7 → A

8 → A

9 → D

10 → A

11 → D

12 → D

13 → B

14 → A

15 → B

16 → A

17 → C

18 → D

19 → A

20 → B

21 → C

22 → A