

Questions on chapters 7,8,9,10,11

1) Inhibitor of ETC at FMN , CoQ is :

- A. Amytal
- B. Rotenon
- C. Antimycin
- D. Cytochrome c
- E. A&B

2) What is the net yield of NADH when 1 mole of glucose 6-phosphate is oxidized by aerobic glycolysis to yield pyruvate?

- A. 0 mole NADH
- B. 1 mole NADH
- C. 2 Mole NADH
- D. 3 mole NADH

3) The most important controlled step in the glycolytic pathway is:

- A. the formation of fructose 1,6 biphosphate
- B. formation of glucose-6-phosphate
- C. Formation of glyceraldehyde-3-phosphate
- D. formation of fructose-6-phosphate
- E. formation of PEP

4) activators of the enzyme pyruvate kinase include:

- A. Insulin
- B. Fructose 1,6, biphosphate

C. Fructose 2,6biphosphate

D. A + B

E. None of the above

5) which enzyme catalyses reaction of PEP to pyruvate?

A. Enolase

B. Pyruvate kinase

C. phosphoglycerate kinase

D. Mutase

E. Hexokinase

6) Glucagon controls the entry of glycolysis by altering the enzymatic action of PFK2, this results in the inhibition of :

A. Fructose,6,phosphate into fructose,1,6biphosphate

B. Glucose6phosphate into fructose6,phosphate

C. Fructose1,6biphosphate into fructose2,6,biphosphate

D. Fructose1,6biphosphate into fructose 6,phosphate

7) which enzyme participates in both glycolytic and gluconeogenic pathways?

A. Glucose-6-phosphate

B. PEP carboxylase

C. Fructose-1,6,phosphatase

D. Glucokinase

E. Glyceraldehyde 3-phosphate dehydrogenase

8) Fructose 2,6,biphosphate :

- A. is required for gluconeogenesis
- B. stimulates fructose 1,6,biphosphatases
- C. increased by cAMP
- D. inhibits PFK1

9)Rate of Glycolysis is increased by

- A. Increased Insulin/glucagon ratio
- B. ATP
- C. Citrate
- D. Increased glucagon/insulin ratio

10) Most of the ATP made during catabolism through:

- A. First stage
- B. Second stage
- C. Third stage
- D. all stages equally

11) which of the following enzymes are regulated?

- A. Glucokinase/hexokinase
- B. Aldolase
- C. Pyruvate Kinase
- D. A+C

E. none of the above

12) rate limiting enzyme of glycolysis :

- A. hexokinase

B. phosphatase1

C. Phosphofructokinase1

D. Aldolase

E. glucokinase

13) the enzyme having low  $K_m$  and low  $V_{max}$  for glucose is :

A. hexokinase

B. phosphatase1

C. Phosphofructokinase1

D. Aldolase

E. glucokinase

14) Pyruvate carboxylase

A) requires acetyl coA for activity

B) catalyses and irreversible reaction in glycolysis

c) requires biotin

D) A+B

E) A + C

16) Which is inhibited by glucose-6-phosphate :

A. hexokinase

B. glucokinase

C. A + B

D. none

17) Which of the following enzymes is found in the liver but not in the muscle?

- A. Hexokinase
- B. Glucose-6-phosphatase
- C. Glycogen phosphorylase
- D. Lactate dehydrogenase

18) which of the following when found in less than normal amount results in glycogen storage disease V?

- A. Hexokinase
- B. Glucose-6-phosphatase
- C. Glycogen phosphorylase
- D. Lactate dehydrogenase

19) In the cori cycle, carbon in the form of lactate carried by blood to liver then back to the muscle in form of?

- A. glucose
- B. pyruvate
- C. ethanol
- D. Acetyl CoA
- E. ATP

20) a substrate for glycogen synthase is :

- A. Glucose-6-phosphate
- B. glucose-1-phosphate
- C. UDP-glucose
- D. free glucose

E. none of the above

21) Both glucagon and epinephrine stimulate \_\_\_\_\_ and inhibit \_\_\_\_\_ -

A. glycogen synthesis / breakdown

B. glycogen breakdown / synthesis

C. glycolysis / gluconeogenesis

D. cAMP breakdown / cAMP formation

E. Glucose uptake / release

22) Which enzyme activates glycogen phosphorylase?

A. glycogen phosphorylase

B. Protein Kinase A

C. Debranching enzyme

D. Phosphorylase kinase

E. Phosphoprotein phosphatase

23) Which enzyme inactivates phosphorylase kinase?

A. glycogen phosphorylase

B. Protein Kinase A

C. Debranching enzyme

D. Phosphorylase kinase

E. Phosphoprotein phosphatase

24) Which of the following enzymes cleaves glucose residues from glycogen chains?

A. glycogen phosphorylase

- B. Protein Kinase A
- C. Debranching enzyme
- D. Phosphorylase kinase
- E. Phosphoprotein phosphatase

25) Insulin promotes glycogen synthesis in the liver by

- A. inhibiting glycogen synthase
- B. binding to phosphorylase
- C. causing the dephosphorylation of both phosphorylase and glycogen synthase
- D. activating phosphorylase
- E. facilitating the entry of glucose to the cell

26) branching in glycogen is important for :

- A. increasing solubility
- B. increasing synthesis rate
- C. increasing degradation rate
- D. All of the above
- E. none of the above

27) All of the following can be broken down in our body except :

- A. cellulose
- B. Starch
- C. amylopectin
- D. glycogen
- E. Triohose

28) Glycogen phosphorylase is :

- A. catalyses the rate limiting step of glycogenolysis
- B. releases glucose 6-phosphate
- C. acts on branched chain of glycogen
- D. A + B
- E. A + B + C

29) Which enzyme forms  $\alpha(1-6)$  linkages?

- A. glycogen phosphorylase
- B. Protein Kinase A
- C. glycogen branching enzyme
- D. Phosphorylase kinase
- E. Phosphoprotein phosphatase

30)  $\alpha(1-4)$  bond is found in:

- A. sucrose
- B. Maltose
- C. Lactose
- D. Galactose

31) Which of the following slows down TCA?

- A. increased concentration of AMP and pyruvate
- B.  $\text{NAD}^+$  and ADP
- C. calcium ions
- D. ATP and NADH



E. fumarate

32) All of the following co-factors are required in the pyruvate dehydrogenase complex except :

A. lipoic acid

B. NAD<sup>+</sup>

C. TPP

D. FAD

E. All are required

33) NADH is produced in all TCA reactions except :

A) Isocitrate dehydrogenase

B) Malate dehydrogenase

C) succinate dehydrogenase

D)  $\alpha$ -keto-glutarate dehydrogenase

E) it is produced in all of them

34) Substrate level phosphorylation occurs from which of the following enzymes?

A. lactate dehydrogenase

B. Succinate dehydrogenase

C. succinate thiokinase

D. fumarase

E. hexokinase

35) when having thiamine deficiency, which enzymatic activity do you expect to be decreased?

- A. pyruvate carboxylase
- B. malate dehydrogenase
- C. fumarase
- D.  $\alpha$ -ketoglutarate dehydrogenase
- E. lactate dehydrogenase

36) Which of the following reaction does not count as energy yielding?

- A. isocitrate to  $\alpha$ -ketoglutarate
- B. fumarate to malate
- C. succinyl coA to succinate
- D. malate to oxaloacetate
- E. None of the above

37) the conversion of pyruvate to PEP requires :

- A. lactate dehydrogenase
- B. PFK1
- C. pyruvate carboxylase
- D. Glucose-6-phosphate dehydrogenase
- E. All of the above

38) Protein kinase is activated by :

- A. production of cAMP
- B. dissociation of  $\alpha$ -subunit from complex
- C. release of a GTP molecule
- D. A + B

E. A + C

39) During well-feed state, all is true except?

- A. Glycogen synthase is activated
- B. Insulin production stimulates glycogen oligotransfarase
- C. Glycogenlysis is inhibited
- D. glycogenin initiates glucose attachment
- E. nothing is false

40) which of the following results in hepatomegaly?

- A. Glycogen storage disease type I
- B. Glycogen storage disease type II
- C. Glycogen storage disease type III
- D. Glycogen storage disease type V
- E. Glycogen storage disease type VII

1E	2C	3A	4D	5B	6A	7E	8A	9A	10C
11D	12C	13A	14E	15D	16D	17B	18C	19A	20C
21B	22D	23E	24A	25C	26D	27A	28D	29C	30B
31D	32E	33C	34D	35D	36B	37C	38D	39B	40A

Good Luck =)