

1) Among the differences between fatty acid biosynthesis and fatty acid oxidation is the fact that:

- a. Biosynthesis proceeds in the mitochondria and oxidation in the cytosol
- b. Biosynthesis uses NADH and oxidation uses FAD
- c. Malonyl-CoA is an intermediate in oxidation, but not in biosynthesis
- d. The acyl group form different thioester in biosynthesis and oxidation

2) Which of the following is a glucocorticoid?

- a. Cholic acid
- b. Cortisone
- c. Cholesterol
- d. Aldosterone

3) Which of the following enzymes and coenzyme pairs required for the first oxidative step in the β -oxidation of fatty acids?

- a. 3-ketoacyl-CoA dehydrogenase and NAD⁺
- b. Acyl-CoA dehydrogenase and FAD
- c. 3-hydroxyacyl-CoA dehydrogenase and NAD⁺
- d. Beta-ketothiolase and CoASH

4) The correct sequence of the carrier of acetyl group during fatty acid biosynthesis is:

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- 6) Which of the following pairs of compounds are derived from cholesterol?**
- Progesterone and aldosterone
 - Cortisone and glycogenin
 - Glycocholate and glycogenin
 - Mevalonate and estradiol
- 7) Which of the following is CORRECT about the beta oxidation of arachidic acid [20:0]**
- Its complex oxidation requires 10 molecules of water
 - Its complex oxidation produces 9 CoA molecules
 - Occurs in 9 cycles
 - Occurs in the cell cytosol
- 8) Each of the following can be synthesized from cholesterol EXCEPT:**
- Insulin
 - Progesterone
 - Cholic acid
 - Testosterone
- 9) Free fatty acids required by cells are obtained from all of the following sources EXCEPT:**
- Hydrolysis of triacylglyceride
 - Hydrolysis of phospholipids
 - Internal biosynthesis
 - Hydrolysis of sphingosine
- 10) Free fatty acids obtained from hydrolysis of triacylglycerol can undergo all the following process EXCEPT:**
- Re-use by cells for different purposes
 - Conversion into acetyl-CoA in cytosol
 - Conversion into acetyl-CoA in mitochondria
 - Complete oxidation

- 11)** Which of the following is NOT an intermediate in the biosynthesis of cholesterol?
- Malonyl-CoA
 - Acetoacetyl-CoA
 - Mevalonate
 - Sequalene
- 12)** The first condensation step in the biosynthesis of fatty acid occurs between?
- Acetyl group bounded to the enzyme synthase and malonyl group bounded to acyl carrier protein
 - Acetyl group bounded to the acyl carrier protein and malonyl group bounded to coenzyme A
 - Acetyl group bounded to the coenzyme A and malonyl group bounded to acyl carrier protein
 - Both acetyl and malonyl groups bound to acyl carrier protein
- 13)** What is the net number of ATP produced from the complete oxidation of butanoic acid [C4:0] into CO₂ and H₂O?
- 18
 - 20
 - 22
 - 24
- 14)** Regarding the Ketone bodies, which of the following statements is INCORRECT?
- They are formed mainly in the liver and used by other organs
 - Their presence in the blood causes ketoacidosis
 - They are water insoluble
 - They can be used by heart muscles as a source of energy
- 15)** In human cells acetyl-CoA can be used for the synthesis of the following compounds EXCEPT:
- Malonyl-CoA
 - Acetone
 - Pyruvate
 - Cholesterol

- 16)** The reaction β -enoyl-CoA \rightarrow β -hydroxyacyl-CoA take place in:
- Beta-oxidation of fatty acids
 - Alcohol fermentation
 - Pentose phosphate pathway
 - Ketone bodies synthesis
- 17)** Which of the following is NOT an intermediate in the biosynthesis of cholesterol?
- Beta-hydroxybutyrate
 - Acetoacetyl-CoA
 - Mevalonate
 - Sequalene
- 18)** Which of the following statements is CORRECT about β -oxidation of cis-vaccinic acid [16:1 Δ 11]
- Occurs in 8 cycles
 - It does not undergo complete oxidation
 - Require cis-trans isomerase
 - Occurs in cytosol
- 19)** Which of the following is necessary for fatty acid biosynthesis?
- NADPH
 - NADH
 - NAD⁺
 - NADP⁺
- 20)** The last carrier of the malonyl group during fatty acid biosynthesis is:
- CoA-SH
 - Beta-ketoacyl-S-ACP synthase [HS-Sase]
 - ACP-SH
 - Biotin

- 21)** The essential fatty acid from the following is:
- Stearate
 - Oleate
 - Linoleate
 - Palmitate
- 22)** How many ATP molecules are produced from complete oxidation of acetoacetate in the brain
- 20 ATP
 - 10 ATP
 - 7.5 ATP
 - 15 ATP
- 23)** Which of the following statements about beta-oxidation is INCORRECT?
- It occurs in the mitochondrial matrix
 - It starts at the methyl group
 - It is an oxidation process
 - It requires carnitine
- 24)** Which of the following enzymes catalyzes the rate limiting step in the cholesterol synthesis?
- Acetyl-CoA carboxylase
 - Citrate lyase
 - HMG-CoA reductase
 - Mevalonate kinase
- 25)** Under starvation conditions acetoacetate is the preferred source of energy in:
- Brain
 - Liver
 - Heart muscle
 - Red blood cells

- 26)** Which of the following statements is NOT CORRECT regarding lipid metabolism?
- It represent a more efficient way of energy storage than carbohydrate
 - Epinephrine decreases lipid catabolism
 - Fatty acids are the main source of energy in lipid metabolism
 - Bile acids are derived from cholesterol
- 27)** Which of the following statements is NOT CORRECT regarding activation of fatty acid for catabolism?
- It occurs in the cytosol
 - It releases pyrophosphate
 - It is catalyzed by acyl-CoA synthetase enzyme
 - It produces acetyl-CoA
- 28)** Which of the following statements is CORRECT regarding ketone bodies?
- They arise when excessive intake of carbohydrate compared to fat
 - They arise when an excess of acetyl-CoA produced from beta-oxidation of fatty acids and shortage of oxaloacetate in the cells
 - They are formed in the cytosole
 - Causes a condition called alkalosis
- 29)** During fatty acid synthesis, chain lengthening and formation of double bonds occur in
- Endoplasmic reticulum
 - Cytosol
 - Mitochondrial matrix
 - Mitochondrial intermembrane space
- 30)** Presence of high cholesterol in the cells causes all of the following EXCEPT:
- Activate acyl-CoA:cholesterolacyltransferase
 - Inhibit HMG reductase
 - Inhibit synthesis of mevalonate
 - Activate synthesis of LDL-receptors

C

A

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A

B

C

A

B

D

B

A

D