Questions recall for biochemistry II

2010-1-16
By darby, bio76

Single choice:

1. Which molecules synthesis is blocked by fluorouracil?

A. UMP
B. UTP
C. dTMP
D. AMP
E. ?

2. Which of the following processes will **decrease** under the physiological level of insulin?
   A. Glucose oxidation
   B. Glycogen phosphorylation
   C. Gluconeogenesis
   D. lipogenesis
   E. Formation of ATP, DNA and RNA
3. Which tissue can use glucose, ketone body and fatty acids as energy sources for ATP production?
   A. Liver
   B. Muscle
   C. Hepatocytes
   D. Brain
   E. Red blood cells
4. Contributing N for both purine and purimidine synthesis?
   A. Glycin
   B. Aspartate
   C. Glutamine
   D. ?
   E. ?
5. What process is involved when pyruvate is converted into PEP?
   A. CO_2 consumption
   B. ATP generation
   C. GTP generation
   D. Pi consumption
   E. ?
6. Carbon fixation happens between CO_2 and:
   A. Ribulose 1,5-bisphosphate
   B. 3-phosphoglycerate

C. Fructose 6-phosphate
D. Ribose 5- phosphate
E. phosphoglycolate

7. Happens in the matrix of mitochondria:
   A. Photosynthesis
   B. Glycolysis
   C. Fatty acid oxidatioin
   D. Oxidative phosphorylation
   E. ?
8. Which of the citric acid cycle and glycolysis intermediates can be used to synthesize glutamine?
9. Which lipid particles can reverse cholesterol:
   A. HDL
   B. LDL
   C. VLDL
   D. Chylomicron
   E. ?
10. Consider the mRNA sequence: (5') AAUGCAGCUUUAGCA (3'). The sequence of the coding strand of DNA is:
    A. (5') ACGATTTCGACGTAA (3')
    B. (3') TTACGTCGAAATCGT (5')
    C. (5') AATGCAGCTTTAGCA (3')
    D. (5') AAUGCAGCUUUAGCA (3')
    E. (3') AATGCAGCTTTAGCA (5')
11. *trp* operon:
    A. catabolic repression
    B. translational repression
    C. ?
    D. ?
12. Which pair correctly matches the enzyme with its allosteric activator?
    A. Phosphofructokinase-1; AMP
    B. Pyruvate kinase; ATP
    C. Hexokinase; ATP
    D. Pyruvate dehydrogenase; NADH
    E. Pyruvate carboxylase; ADP
13. Carnitine's role?
14. Which is the rate limiting step of fatty acid synthesis?
    A. Malonyl-CoA synthesis
    B. ACP…
    C. ?
    D. ?
    E. ?
15. which of the phrase does not describe purine synthesis?
    A. Synthesis of the purine ring independent of PRPP.

B. ?
C. ?
D. ?
E. ?

16. DNA polymerase I's role?
17. Which molecule is required to separate the two strands of DNA in *E.Coli*
    A. DNA gyrase
    B. Helicase
    C. Polymerase
    D. SSB
    E. ?
18. Skeletal muscle does not contribute glucose to the blood because
    A. They don't have glucose 6-phosphatase
    B. ?
    C. ?
    D. ?
    E. ?
19. In bacteria the elongation stage of protein synthesis does not involve:
    A. Aminoacyl-tRNAs
    B. EF-Tu
    C. GTP
    D. IF-2
    E. Peptidyl transferase
20. The conversion of pyruvate to oxaloacetate is likely to require which of the following enzyme?
    A. Biotin
    B. Vitamin B_{12}
    C. Thiamine pyrophosphate
    D. Flavin adenine dinucleotide
    E. Pyridoxal phosphate
21. Which of the following molecule of citric acid cycle or glycolysis can lead to the synthesis of glutamine?
    A. Oxaloacetate
    B. PEP
    C. α-ketoglutarate
    D. ?
    E. ?
22. What kind of amino acids is both ketogenic and glucogenic?
    A. Amino acids that can be converted into pyruvate
    B. Amino acids that can be converted into oxaloacetate
    C. Amino acids that can be converted into fumarate
    D. Amino acids that can be converted into acetyl-CoA
23. Which of the following compounds serves as a primary link between the citric acid and the urea cycle?

A. Malate
B. Succinate
C. Isocitrate
D. Citrate
E. Fumarate

24. What does the term “essential” mean in terms of amino acids in the human diet?
A. Necessary for all the protein synthesis
B. Only available in animal protein
C. Cannot be synthesized by human
D. Cannot be coded for by DNA
E. Cannot be degraded in the liver

25. Which of the following statements about the pentose phosphate pathway is **not** true?
A. It generates NADH for reductive biosyntheses.
B. The reaction occurs in the cytosol
C. It is more active in muscle cells than in fat-storage cells.
D. It interconverts trioses, tetroses, pentoses, hexoses, and haptoses.
E. Through this pathway, excess ribose 5-phosphate can be converted into glycolytic intermediates.

Multiple choices (with more than two correct answers):

1 Which of the following molecules can inhibit purine synthesis?
A ATP
B GTP
C AMP
D GMP
E IMP

2 Ammonia is transported in blood in the form of:
A Glutamate
B Glutamine
C Alanine
D Urea
E

3 Enzymes that involved in producing NADH:
A Isocitrate dehydrogenase
B Pyruvate dehydrogenase
C Succinate dehydrogenase
D Lactate dehydrogenase
E α-ketoglutarate dehydrogenase

4 Using NADPH:
A Fatty acid synthesis
B Cholesterol synthesis
C Robonucleotide reduction
D Gluconeogenesis

E Ketone body formation

5 PFK-1's regulation:
   A Activated by AMP
   B Inhibited by ATP
   C ATP increases the $K_{0.5}$ for fructose 6-phosphate.

6 Assuming the 5' to 3' connection of writing nucleotide sequence, indicate which of the following mRNA codons can be recognized by the tRNA anticodon ICG:
   A UGC
   B UGA
   C CGA
   D CGU
   E CGC

7 What is required by biosythesis of fatty acid?
   A ATP
   B NADH
   C NADPH
   D Acetyl-CoA
   E $FADH_2$

8 The enzyme(s) responsible for the transcription of eukaryotic tRNA:
   A RNA polymerase I
   B RNA polymerase II
   C RNA polymerase III
   D Reverse transcriptase
   E ?

9 Which of the following events occur in the eukaryotic nuclear?
   A DNA replication
   B 5' capping
   C 3' polyadenylation
   D Splicing
   E translation

Simple answer questions:

1. What's an Acetyl-CoA carboxylase inhibitor's effect on fatty acid synthesis and fatty acid oxidation?
2. When using $(CU)_n$ as the template, we get peptide strand consisting of either Leu or Ser. When using $(CCU)_n$ as the template, we get peptide strand consisting of Pro or Leu or Ser. Which code is for Pro? Expain.
3. Although no oxygen is involved in citric acid cycle, when lacking of oxygen, the cycle can not continue, explain why.
4. citrate is an intermediate of citric acid cycle. Please write down two other roles of citrate in the intermediate of metabolism.
5. under what condition(culture medium) is *lac* operon activated?
6. Antimycin A blocks electron transfer between cytochrome *b* and c_1.If intact mitochondria

were incubated with antimycin A, excess NADH and an adequate supply of O_2, which electron carrier would be found to be in the reduced state?

Comprehensive questions:

1. What is the effect of F2,6BP on glycolysis and gluconeogenesis? What is the mechanism by which the F2.6BP regulates the PFK-1 and F1,6BPase? How is glucagons affecting F2,6BP's concentration?(12 points)
2. Demonstrate at least 3 similarities and 3 differences between RNA polymerase based RNA synthesis and DNA polymerase based DNA synthesis.(9 points)