Test questions

From the Chemistry Exam to the Final Exam in Biochemistry

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Question

Which of the following vitamins is required for the transamination reactions?

a. Coenzyme A
b. Pyridoxal-phosphate
c. Folic acid
d. Biotin
e. Cobalamine

Question

Urea is synthesized in:

a. Cytoplasm
b. Mitochondria
c. Lysosome
d. Peroxysome
e. Both cytoplasm and mitochondria

Question

Which of the following is a common compound shared by the TCA cycle and the urea cycle?

a. Isocitrate
b. α-Ketoglutarate
c. Succinyl-CoA
d. Fumarate
e. Oxaloacetate

Question

All of the following amino acids are both glucogenic as well as ketogenic, *except*:

a. Isoleucine
b. Leucine
c. Tyrosine
d. Phenylalanine
e. Threonine

Question

Which of the following amino acids is a precursor of a mediator in allergies and inflammation?

a. Histidine
b. Tyrosine
c. Glutamic acid
d. Phenylalanine
e. Tryptophan

Question

Glycine and proline are the most abundant amino acids in the structure of:

a. Hemoglobin
b. Myoglobin
c. Collagen
d. Glucagon
e. Insulin

Question

In scurvy, which amino acid that is normally part of collagen is not synthesized?

a. Hydroxy-alanine
b. Hydroxy-tryptophan
c. Hydroxy-tyrosine
d. Hydroxy-proline
e. Hydroxy-threonine

Question

Which of the following amino acids is the uncharged derivative of an acidic amino acid?

a. Cysteine
b. Glutamine
c. Tyrosine
d. Tryptophan
e. Serine

Question

Dopamine is synthesized from which of the following amino acids?

a. Tyrosine
b. Tryptophan
c. Histidine
d. Methionine
e. Serine

Question

Choose the right set of amino acids in the structure of glutathione:

a. Glutamine - Glycine - Cysteine
b. Cysteine - Glycine - Glutamic acid
c. Glutamic acid - Glycine - Cysteine
d. Glutamine - Cysteine - Glycine
e. Glutamic acid - Cysteine - Glycine

Question

Maple syrup urine disease results from an inborn error of metabolism of certain amino acids. Which ones?

a. Phenylalanine and tyrosine
b. Leucine, isoleucine, and valine
c. Serine and threonine
d. Any acidic amino acids
e. Cysteine and methionine

Question

A deficiency of which of the following enzymes would result in high blood levels of homocysteine (and also methionine)?

A. Tyrosine hydroxylase
B. Cystathionine β-synthase
C. Threonine dehydratase
D. Glutathione reductase
E. L-amino acid oxidase

Question

Which of the following answers describes best the order of defective enzymes in phenylalanine degradation?

A. Phenylketonuria - Tyrosinemia type II - Tyrosinemia type I - Alkaptonuria - Tyrosinemia type III

B. Tyrosinemia type I - Tyrosinemia type II - Tyrosinemia type III - Phenylketonuria - Alkaptonuria

C. Alkaptonuria - Tyrosinemia type II - Tyrosinemia type I - Tyrosinemia type III - Phenylketonuria

D. Phenylketonuria - Tyrosinemia type II - Tyrosinemia type III - Tyrosinemia type I - Alkaptonuria

E. Phenylketonuria - Tyrosinemia type II - Tyrosinemia type III - Alkaptonuria - Tyrosinemia type I

Question

Which of the following contributes nitrogen atoms to both purine and pyrimidine rings?

a. Aspartate
b. Glutamate
c. Carbon dioxide
d. Glycine
e. Carbamoyl-phosphate

Question

Which of the following is an analogue of hypoxanthine?

a. Cytosine arabinoside
b. Allopurinol
c. Ribose phosphate
d. PRPP
e. Fluoro-uracil

Question

DNA is an organic polymer (a big molecule) composed of monomers (building blocks) called…

a. amino acids

b. nucleic acids

c. nucleotides

d. phospholipids

e. peptides

Question

Which is true about the pairing of bases in the DNA molecule?

a. purines always pair with pyrimidines

b. a single ring base pairs with another single ring base

c. a double ring base pairs with another double ring base

d. purines pair with purines and pyrimidines with pyrimidines

Question

Which nucleotide bases could be found in a molecule of DNA?

a. adenine, guanine, cytosine, thymine

b. adenine, guanine, thymine

c. adenine, guanine, cytosine, uracil

d. sugar, phosphate and base

Question

Replication is when...

a. proteins are made

b. RNA is made from the DNA template

c. another copy of DNA is made

d. DNA is made from the RNA template

Question

If the molar amount of G in a DNA sample is 20%, what is the molar amount of T in the same sample?

a. 20%
b. 30%
c. 40%
d. 60%

Question

The template is read in replication in the

a. 3’-5’ direction
b. 5’-3’ direction
c. From both directions
d. Any of these directions
e. None of these directions

Question

In a newly synthesized prokaryotic DNA strand, the primers are removed by:

a. DNA polymerase I
b. DNA polymerase II
c. DNA polymerase III
d. DNA ligase
e. Topoisomerase II

Question

The 5’-3’ exonuclease activity involves all except:

a. Removal of one nucleotide at a time in the properly base paired DNA
b. Altered nucleotides can also be removed
c. Activity of both DNA polymerase I and III
d. DNA repair can also be undertaken by this activity

Question

Which nucleotide bases could be found in a molecule of RNA?

a. adenine, guanine, cytosine, thymine
b. adenine, guanine, thymine
c. adenine, guanine, cytosine, uracil
d. sugar, phosphate and base

Question

An endonuclease is an enzyme that hydrolyzes:

a. A nucleotide from only the 3’ end of an oligonucleotide
b. A nucleotide from either terminal of an oligonucleotide
c. A phosphodiester bond located in the interior of a polynucleotide
d. A bond only in the specific sequence of nucleotides
e. A nucleotide from only the 5’ end of an oligonucleotide

Question

Which of the following RNAs contains both a 7-methyl-guanosine cap and a polyadenylate segment?

a. miRNA
b. tRNA
c. snRNA
d. mRNA
e. rRNA

Question

Which of the following does not need a primer in order to function?

a. DNA polymerase I
b. DNA polymerase II
c. DNA polymerase III
d. RNA polymerase

Question

Which of the following is required to end joining of DNA?

a. DNA polymerase I
b. DNA polymerase II
c. DNA polymerase III
d. RNA polymerase
e. DNA ligase

Question

Transcription is when...

a) a new DNA molecule is made

b) a complementary RNA molecule is made based on information in the DNA template

c) protein is made by the coordinated efforts of DNA and RNA

d) the replication bubble unwinds in the antiparallel direction

Question

Which of the following processes is not involved in the posttranscriptional processing of tRNA?

a. Attachment of polyA tail
b. Cutting by RNase P and RNase D
c. Splicing
d. Attachment of CCA arm
e. Base modification

Question

What is the function of snRNPs?

a. Attachment of polyA tail
b. 5’ capping in mRNA
c. Splicing
d. Base modification
e. All of the above

Question

Which of the following types of RNA participate in mRNA processing?

a. tRNA
b. rRNA
c. siRNA
d. snRNA
e. snoRNA

Question

Which of the following types of RNA participate in rRNA processing?

a. tRNA
b. rRNA
c. siRNA
d. snRNA
e. snoRNA

Question

The RNA primer is removed from the Okazaki fragment by:

a. DNA polymerase I
b. DNA polymerase II
c. DNA polymerase III
d. RNA polymerase
e. DNA ligase

Question

Telomerase does which of the following:

a. Joins Okazaki fragments on the lagging strand
b. Catalyzes DNA replication at the ends of the chromosome
c. Enhances transcription
d. Requires dCTP

Question

Eukaryotic RNA polymerase I is specialized to transcribe which of the following?

a. Messenger RNA
b. Transfer RNA
c. Ribosomal RNA
d. Mitochondrial RNA

Question

Actinomycin D is an inhibitor of:

a. Replication
b. Transcription
c. Translation
d. All of the above

Question

Which of the following describes the role of CCA triplet in tRNA?

a. Ribosome binding
b. Amino acid binding
c. Stability of tRNA
d. Protein chain binding
e. mRNA binding

Question

Which type of RNA includes the anticodon and brings the amino acids to the site of protein synthesis?

a. mRNA
b. rRNA
c. tRNA
d. siRNA
e. snoRNA

Question

Translation is when...

a. a new DNA molecule is made

b. a complimentary RNA molecule is made based on information in the DNA template

c. protein is made by the coordinated efforts of DNA and RNA

d. the replication bubble unwinds in the antiparallel direction

Question

What is added to the 3’ end of many eukaryotic mRNAs after transcription?

a. Introns
b. Cap of modified G nucleotide
c. PolyA tail
d. Trinucleotide CCA

Question

What is added to the 5’ end of many eukaryotic mRNAs after transcription?

a. Introns
b. Cap of modified G nucleotide
c. PolyA tail
d. Trinucleotide CCA

Question

What is added to the 3’ end of many eukaryotic tRNAs after transcription?

a. Introns
b. Cap of modified G nucleotide
c. PolyA tail
d. Trinucleotide CCA

Question

All of the following are used in PCR except:

a. Taq polymerase

b. Restriction enzymes

c. Oligonucleotide primers

d. Deoxynucleoside triphosphates

Question

The anticodon region is an important structural component of:

a. mRNA
b. tRNA
c. rRNA
d. DNA
e. miRNA

Question

What do second messengers do?

a) transport a signal molecule through the lipid bilayer and into the cytoplasm

b) relay a message from the receptor of the first messenger throughout the cytoplasm

c) transmit a message from the outside of the membrane to the extracellular fluid

d) produce a cellular response such as the production of a protein

Question

The metabolic effects of epinephrine and glucagon differ in that

a) only glucagon stimulates gluconeogenesis.
b) only epinephrine mobilizes fatty acids.
c) only epinephrine stimulates glycogen breakdown.
d) only epinephrine stimulates glycolysis.

Question

Which of the following enzyme's gene expression is inhibited by insulin?

a) Hexokinase II
b) Hexokinase IV
c) PEP carboxykinase
d) Pyruvate kinase

Question

Insulin receptor is an example of

a) Steroid receptors

b) Serpentine receptors

c) Adhesion receptors

d) Receptor enzymes

Question

Which of the following is an intracellular second messenger?

a) Acetylcholine

b) Glycine

c) IP_3

d) Glutamate

Question

Which of the following catalyzes the cutting of PIP_2 into IP_3 and diacylglycerol in cell signaling?

a) Phosphokinase C

b) Phospholipase C

c) Lipokinase

d) Phosphodiesterase C

Question

Which of the following statements best describes insulin?

a. It is a small peptide composed of a single chain bridged by disulfide groups.
b. It does not have a prohormone form.
c. Its action is antagonistic to that of glucagon.
d. It promotes glucose absorption from intestine and renal tubular cells.
e. It has a direct role in the uptake of glucose in nerve and red blood cells.

Question

The cGMP-dependent protein kinase is also called

a) Protein kinase B

b) Protein kinase A

c) Protein kinase G

d) Protein kinase C

Question

Which of the following is a short-lived messenger that acts by stimulating a soluble guanylyl cyclase, raising [cGMP] and stimulating PKG?

a) NO

b) NO_2

c) NO_3^-

d) N_2O

Question

Which of the following amino acids acts as a component of histones and a precursor for nitric oxide (NO)?

a. Asparagine
b. Leucine
c. Histidine
d. Arginine
e. Lysine

Question

Ubiquitin is a

a) Protein kinase

b) Protease

c) Component of the electron transport system

d) Protein that tags another protein for proteolysis

Question

How do steroid hormones produce their effects in cells?

a) By activating key enzymes in metabolic pathways

b) By binding to intracellular receptors and promoting transcription of specific genes

c) By promoting degradation of specific mRNAs

d) By activating translation of certain mRNAs

Question

Which of the following is not involved in signal transduction by β-adrenergic receptor pathway?

a) GTP

b) ATP

c) cAMP

d) cGMP

e) GDP

Question

The enzyme activated by cyclic AMP, passing on the hormonal signal is

a) Protein kinase B

b) Protein kinase A

c) Protein kinase C

d) G protein receptor kinase

Thank you for your attention!