

Example questions for the Master of Biochemistry entrance exam

Please keep in mind that the entrance exam will be significantly longer (at least 20 questions) and that we will not use the example questions for the real entrance exam.

1. How are the following DNA lesions repaired? Name one mechanism for each case:
 - a) Thymine dimer,
 - b) DNA double strand break,
 - c) mismatched base pair.
2. What are the three steps of pre-mRNA processing in eukaryotes?
3. Name an example for an amino acid with a
 - (a) basic,
 - (b) acidic and
 - (c) aromatic side chain.
4. What is apoptosis? What is the biochemical activity of caspases in this process?
5. What is a (
 - a) karyotype,
 - (b) gonosome,
 - (c) autosome?
6. Name three metabolic functions or pathways that take place in the mitochondrion.
7. Draw the chemical structure of adenosyl triphosphate.
8. What is the function of U1 and U2 snRNAs in mRNA splicing?
9. List the important functional elements of an *E. coli* plasmid vector.
10. Explain how the following chromatographic techniques separate proteins:
 - a) affinity chromatography,
 - b) size exclusion chromatography,
 - c) hydrophobic interaction chromatography.