

Model Questions of Biochemistry Olympiad:

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1. Which of the followings is an accurate statement regarding the differences between DNA and RNA?
  - a. RNA is usually double-stranded, but DNA is usually single-stranded.
  - b. RNA has the sugar deoxyribose, but DNA has the sugar ribose.
  - c. RNA contains three different nucleotides, but DNA contains four different nucleotides.
  - d. Instead of thymine RNA contains the base uracil.

Ans: d

2. The cells in your skin have a different shape and function from the cells in your liver because the two types of cells have different \_\_\_\_\_.
  - a. DNA
  - b. Proteins
  - c. Lipids
  - d. carbohydrates

Ans: b

3. Which type of RNA does not code for proteins?
  - a) Messenger RNA (mRNA)
  - b) Transfer RNA (tRNA)
  - c) Ribosomal RNA (rRNA)
  - d) Both b and c

Ans: d

4. Consider a bacterial gene composed of 120 nucleotides with coding sequence spanning from 19 to 117 nucleotides followed by a stop codon. What would be the maximum length of the proteins encoded by this gene?
  - a) 99
  - b) 33
  - c) 34
  - d) 21

Ans: b

5. How two separate strands of the duplex DNA molecule are held together
- a) By hydrogen bonds
  - b) By Covalent bonds
  - c) By electrostatic force
  - d) All the above

Ans: a

6. Which of the following statement is true for DNA molecule?
- a) DNA is less stable than RNA
  - b) Two separate strands of DNA run in parallel fashion in the duplex DNA molecule.
  - c) DNA is only found in nucleus within the cells
  - d) None of the above

Ans: d

7. Which of the following statement is not correct?
- a) There are 64 codons
  - b) One amino acid can be specified by only one codon.
  - c) Some codons are used for the termination of the transcription process
  - d) There are more codons than amino acids

Ans: b

8. Which one of the following statement is not a feature of catabolic reaction?
- a) They provide energy
  - b) They often produce NADH and FADH<sub>2</sub>
  - c) They involve the synthesis of glycogen
  - d) Glycolysis is an example of catabolic pathway

Ans: c

9. Which one of the following statement regarding the red blood cells is not true?
- a) RBCs contain haemoglobin
  - b) RBCs utilize glucose for energy production
  - c) RBCs carries O<sub>2</sub> from lungs to muscle tissues
  - d) RBCs contain 23 pair of chromosome in the nucleus

Ans: d

10. Which of the following characteristics is correct for human genes

- a) All human genes encode for proteins
- b) One gene can give rise to only one copy of mRNA
- c) Human genes can have non-coding intervening sequences
- d) Total number of human genes is 35,000

Ans: c

11. During the DNA replication, the sequence 5'- TpApGpAp-3' would produce which of the following complementary sequences?

- a) 3'- pTpApGpA-5'
- b) 5'- TpCpTpAp-3'
- c) 5'- ApTpCpTp-3'
- d) 3'- pTpCpApT-5'

Ans: b

12. Suppose you have the following ds DNA sequence representing a gene:

5'-ATGTCACCTGCTTAA-3'----- is the mRNA like strand  
5'-TACAGTGGACGAATT-3'-----is the template strand

What would be the right mRNA sequence for this gene?

- a) 5'-AAUUCGUCCACUGUA-3'
- b) 3'-AAUUCGUCCACUGUA-5'
- c) 5'- ATGTCACCTGCTTAA -3'
- d) 3'-ATGTCACCTGCTTAA-5'

Ans: a

13. Genome of a Virus is composed of-

- a) DNA
- b) RNA
- c) Protein
- d) Either a or b

Ans: d

14. The name of the first cloned mammal (Sheep) was-

- a) Bobby
- b) Dolly
- c) Jolly
- d) None of the above

Ans: b

15. Virus that infects bacteria is called-

- a) Prophage
- b) Virion
- c) Bacteriophage
- d) Megakaryocytes

Ans: c

16. Meiosis occurs in which type of cells?

- a) Somatic cells
- b) Liver cells
- c) Neurons
- d) Germ cells

Ans: d

17. True or False?

- a) All the naturally occurring amino acids found in biological system are L- stereoisomer.

Ans: T

- b) Leucine (L), Isoleucine (I) and Valine (V) are hydrophilic amino acids.

Ans: F

- c) Carbohydrate can be stored as starch in human liver.

Ans: F

- d) Cholesterol is synthesized in plant tissues.

Ans: F

18. Ribosomes are complex arrangements of----

- a. RNA and DNA.
- b. RNA and proteins.
- c. RNA and sugars.
- d. DNA and proteins.

Ans: b

19. In DNA and RNA adenine pairs with ----- and ----- respectively.

- a) Guanine and cytosine
- b) Thymine and uracil
- c) Guanine and thymine
- d) Cytosine and thymine

Ans: b

20. True or false

- a) Eukaryotic mRNA differs from prokaryotic mRNA.

Ans: T

- b) Human genome contains 3.2 billion base pairs.

Ans: T