

Principles of molecular biology Burton E. Tropp 12th edition

Chapter 1 (1.3 – 1.6) Test

1) The deoxyribose sugar and the ribose sugar differ in:

- A) only one substituent: deoxyribose has a hydrogen atom at carbon-3
- B) only two substituents: deoxyribose has a hydrogen atom at carbon-1 and carbon-3
- C) only two substituents: deoxyribose has a hydrogen atom at carbon-2 and carbon-3
- D) only one substituent: deoxyribose has a hydrogen atom at carbon-2
- E) None of the above

2) Streptococcus pneumoniae is:

- A) A bacterial strain responsible for human pneumonia
- B) Was studied by Fred Griffith
- C) Has a surrounding polysaccharide capsule that protects it from the body's defense systems
- D) A+C
- E) All the above

3) Which of the following is false:

- A) T, C, A, and G combine with deoxyribose to form a class of compounds called deoxyribonucleosides
- B) Each purine base is linked to the pentose ring by a bond that joins N-9
- C) The bond that is established between a ribose sugar and a nitrogen base is called an N-glycosylic bond
- D) All pyrimidines have an oxygen linked to its second carbon
- E) Thymidine-5'-triphosphate is phosphomonoester

4) A piece of DNA molecule has [A=35] [G=25] [C=??] [T=??] which of the following is true about it:

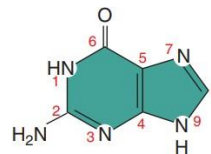
- A) The length of the DNA piece is 408 Å
- B) There are 145 hydrogen bonds
- C) There are 270 hydrogen bonds
- D) The length of the DNA piece is approximately 20.4 nm
- E) B+D

5) Choose the correct answer of the following:

- A) α -anomer is represented by drawing the hydroxyl group attached to C-1 above the plane of the ring
- B) β -anomer is represented by drawing the hydroxyl group attached to C-1 below the plane of the ring
- C) The only difference between uracil and thymine structure is that the latter contains an ethyl group attached to carbon-5
- D) Ribofuranose and deoxyribofuranose have puckered rather than planar conformations
- E) A+B

6) The following molecule is a:

- A) Adenine
- B) Guanine
- C) Cytosine
- D) Thymine
- E) Uracil



7) Everything about Chargaff is true except:

A) His rule states that double stranded DNA has equimolar adenine and thymine concentrations as well as equimolar guanine and cytosine concentrations

B) His rule states that DNA composition varies from one genus to another

C) He came with his rule in 1950

D) His rule contributed to Watson's and Crick model

E) All of the above

8) The atom that acts as a bridge between C-1 and C-4 in ribose is:

A) Nitrogen

B) Carbon

C) Oxygen

D) Hydrogen

E) Phosphate

9) An experiment is done in which a Guanine is put with desaturase (an enzyme that desaturates the molecule by removing hydrogen atoms and forms a double bond), an oxidase (an enzyme that reduces the molecule and removes the bound oxygen) and aminotransferase that transfers NH₂ group to the molecule, depending on what you studied the most accurate expected product from the following is:

A) Adenine

B) Thymine

C) Uracil

D) Guanine

E) Cytosine

10) The aldehyde group in the pentose is in:

A) Carbon-2

B) Carbon-1

C) Carbon-3

D) Carbon-4

E) Carbon-5

11) The following molecule is called:

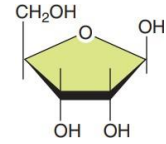
A) α -D-ribofuranose

B) β -D-ribofuranose

C) α -D-deoxyribofuranose

D) β -D-deoxyribofuranose

E) None of the above



12) Which of the following is false:

A) Phosphodiester bond is formed between neighboring nucleosides

B) Ester bond is formed between a phosphate molecule and a single sugar

C) N-glycosylic bond is formed between the backbone of a nucleotide contents

D) 3'-CMP is also called cytidylate E) C+D

13) Which of the following is true:

A) tRNA molecules carry inactivated amino acids to programmed ribosomes

B) The central dogma states that the information flow from DNA to RNA to protein

C) A codon is 3 adjacent nucleotides which specifies the same amino acid in bacteria, plants, and animals

D) B+C E) The genetic code isn't universal

14) Which of the following is true:

A) Uracil is a purine B) Adenine is a pyrimidine C) Cytosine is a pyrimidine D) A+B E) All choices

15) In a strand of a DNA molecule the ratio of Adenine to all nitrogen bases in the strand was 0.2, the expected number of all nitrogen bases in the complementary strand of the same DNA is:

- A) [A=17] [G=33] [C=17] [T=53]
B) [A=45] [G=34] [C=56] [T=15]
C) [A=12] [G=22] [C=18] [T=28]
D) [A=40] [G=28] [C=12] [T=20]
E) [A=33] [G=18] [C=12] [T=27]

16) The complementary strand for the following strand pApCpTpApGpTpApGpC is written as:

- A) 5' -GCTACTAGT-3' B) 5' -GCTCATAGT-3' C) 5' -GCTACTATG-3'
D) A+E E) 3' -TGATCATCG -5'

17) Oswald Avery, Colin MacLeod, and Maclyn McCarty did:

- A) determine the chemical nature of the transforming principle
- B) show that the transforming principle was a deoxyribose-containing nucleic acid
- C) they confirmed that DNA is the hereditary material with conclusive proof to all scientists
- D) All the above
- E) A+B

18) Which of the following is true about a DNA molecule that has a length of 680 Å:

- A) Its diameter is 20 nm
- B) It has 200 nucleotides
- C) It has approximately 20 major grooves
- D) Its strands aren't antiparallel to each other
- E) B+C

19) The pentose sugars in DNA and RNA are called furanoses because:

- A) Because the sugar rings are derivatives of furan
- B) Because they are furans with an aldehyde substituent
- C) Because of their 3D space
- D) Relatively to the scientist furan
- E) None of the above

Answers:

1) *D*

6) *B*

11) *B*

16) *D*

2) *E*

7) *E*

12) *E*

17) *D*

3) *E*

8) *C*

13) *D*

18) *C*

4) *E*

9) *A*

14) *C*

19) *A*

5) *D*

10) *B*

15) *D*

BY:MOLECULAR TEAM 022