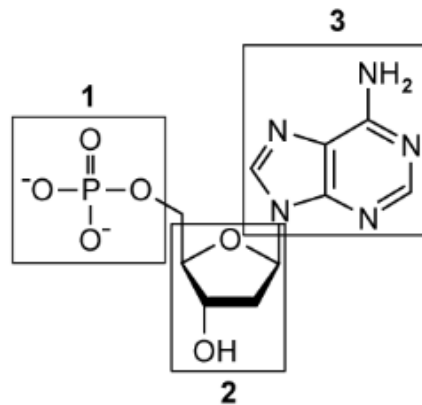




Question 1 :

The following diagram represents the structure of a nucleotide.



Which row of the following table correctly identifies all the components of this nucleotide?

	1	2	3
A.	Adenine	Pentose sugar	Phosphate group
B.	Phosphate group	Adenine	Pentose sugar
C.	Pentose sugar	Phosphate group	Adenine
D.	Phosphate group	Pentose sugar	Adenine



Question 2 :

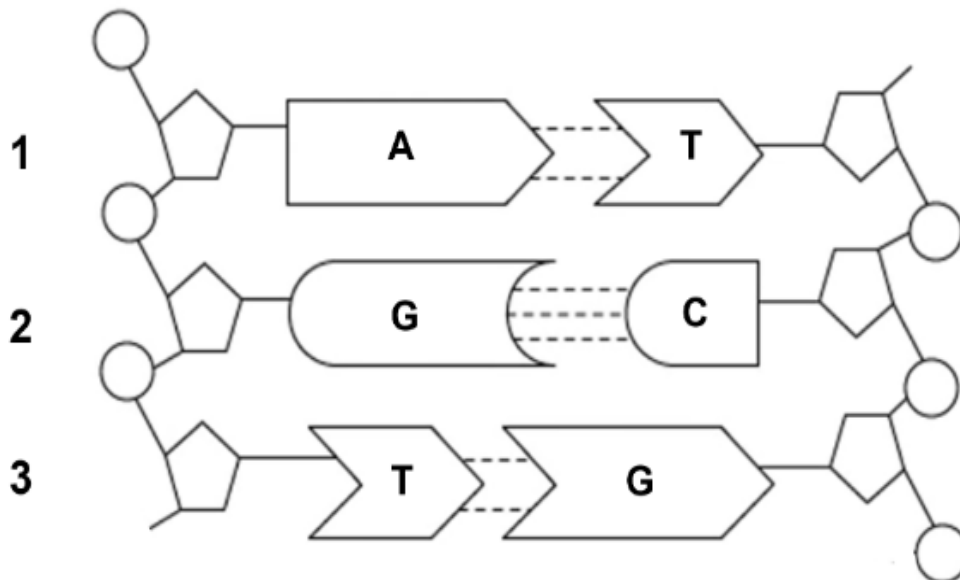
Which of the following statements **only** apply to RNA?

- I. The molecule is in the shape of a double helix, with antiparallel strands
- II. The four bases are adenine, cytosine, guanine, thymine
- III. Ribose is present as the pentose sugar in its nucleotides
- IV. It is a polymer formed by the linkage of many nucleotides

- A.** I and III
- B.** I, II and IV
- C.** II, III and IV
- D.** III and IV

Question 3 :

The following diagram shows a section of a DNA molecule.



Which of these base pairs are **not** correct?

A. None

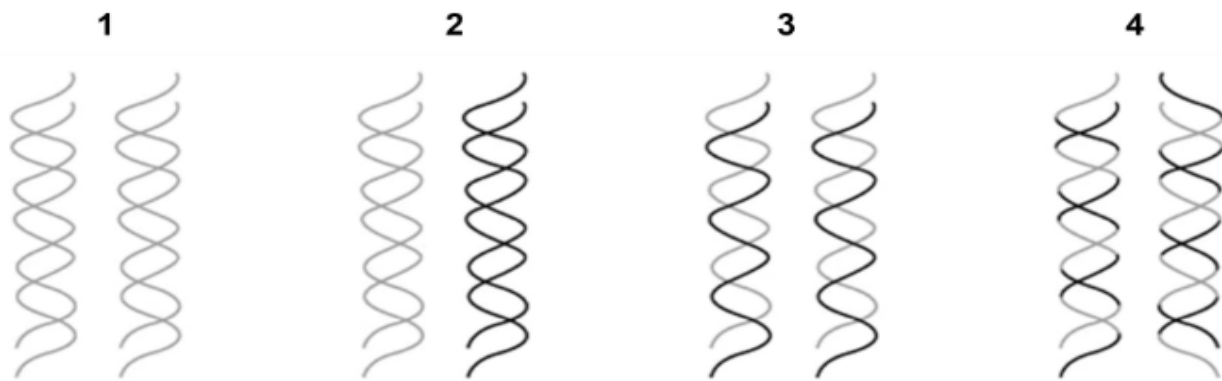
B. 1

C. 2

D. 3

Question 4 :

The diagram shows the outcomes from four different models of DNA replication after one nuclear division. The parent DNA is shown in black and the newly synthesised DNA is shown in grey.



Which diagram represents semi-conservative DNA replication?

A. 1

B. 2

C. 3

D. 4

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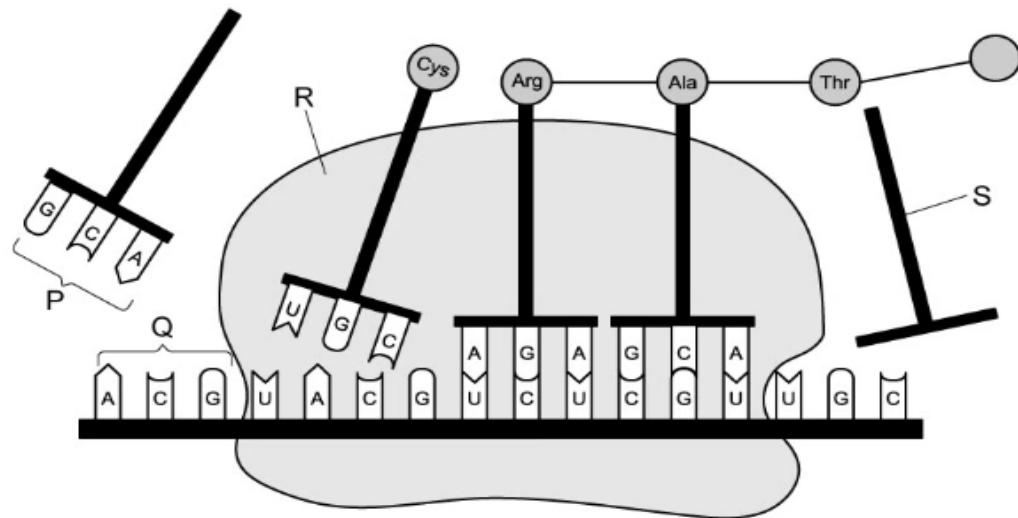
Question 5 :

Which of the following steps is **not** involved in the process of transcription?

- A. The DNA double helix separates into single strands
- B. DNA polymerase binds to one of the single strands and moves along the gene**
- C. Free RNA nucleotides are joined together by covalent bonds
- D. The RNA molecule detaches from the DNA template strand at the end of the gene

Question 6:

The following diagram shows the process of translation.



Which row of the following table correctly identifies the labelled components?

	P	Q	R	S
A.	anticodon	codon	ribosome	mRNA
B.	codon	anticodon	ribosome	tRNA
C.	anticodon	codon	ribosome	tRNA
D.	codon	anticodon	mRNA	ribosome

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Question 7 :

A section of a DNA molecule contains the following base sequences:

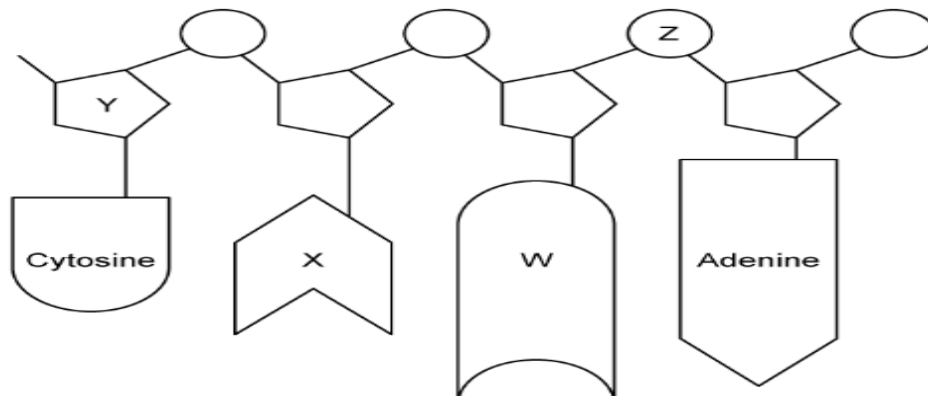
ATA CCT GCA

Which of the following would represent the base sequences of the codons on the mRNA molecule after transcription?

- A.** ATA CCT GCA
- B.** AUA CCU GCA
- C.** TAT GGA CGT
- D.** UAU GGA CGU

Question 8 :

The image below shows a representation of several nucleotides in a molecule of DNA.



Identify the structures marked **Y** and **Z**.

Y : deoxyribose **Z : phosphate**

Identify the nitrogenous bases in part b) marked **X** and **W**.

W : guanine **X: thymine**

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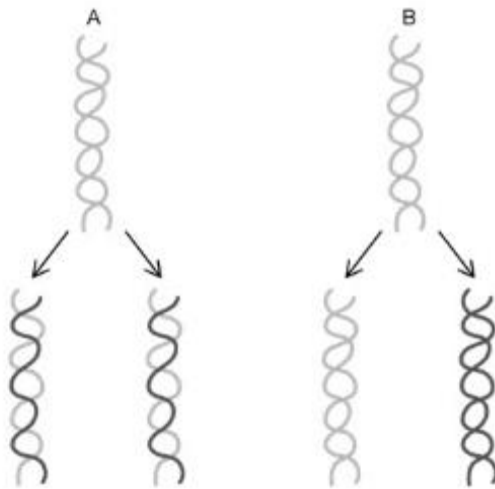


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Question 9 :

The diagrams below show two models of DNA replication.



State, with a reason, which diagram, **A** or **B**, is correct.

A shows semi - conservative replication / half of the new double helix contains original DNA while half contains new DNA .

Question 10 :

Which of the following processes involve **both** DNA and RNA?

I. Replication

II. Transcription

III. Translation

IV. Protein synthesis

A. I and II

B. I, II and IV

C. III only

D. II and IV

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Question 11 :

A section of a DNA molecule contains the following base sequences:

ATA CCT GCA

Which of the following would represent the base sequences of the codons on the mRNA molecule after transcription?

- A.** ATA CCT GCA
- B.** AUA CCU GCA
- C.** TAT GGA CGT
- D.** UAU GGA CGU

Question 12 :

Which row of the table contains three correct statements about DNA replication, transcription and translation?

	DNA replication	Transcription	Translation
A	produces mRNA	occurs in the cytoplasm	tRNA involved
B	DNA polymerase involved	RNA polymerase involved	produces mRNA
C	is semi-conservative	produces mRNA	occurs at a ribosome
D	occurs in the nucleus	occurs in the nucleus	RNA polymerase involved

Question 13 :

Describe the process of transcription .

Transcription is the copying of a DNA sequence to make mRNA, using the catalyst RNA polymerase (it occurs in the nucleus)

It involves the following stages:

1. RNA polymerase uncoils a section (gene) of the DNA double helix.
2. RNA polymerase links free RNA nucleotides to form an RNA strand (using a DNA strand as a template). This is done through complementary base pairing, however, in the RNA chain, the base thymine is replaced by uracil.
3. The mRNA strand then elongates and separates from the DNA template.
4. The DNA strands then reform a double helix.
5. The mRNA leaves the nucleus and moves out through the pores on the nuclear membrane.

Question 14 :

Compare and contrast mRNA and tRNA.

Both contain RNA mono nucleotides / ribose sugar / uracil , adenine ,cytosine ,guanine .

Both are single stranded

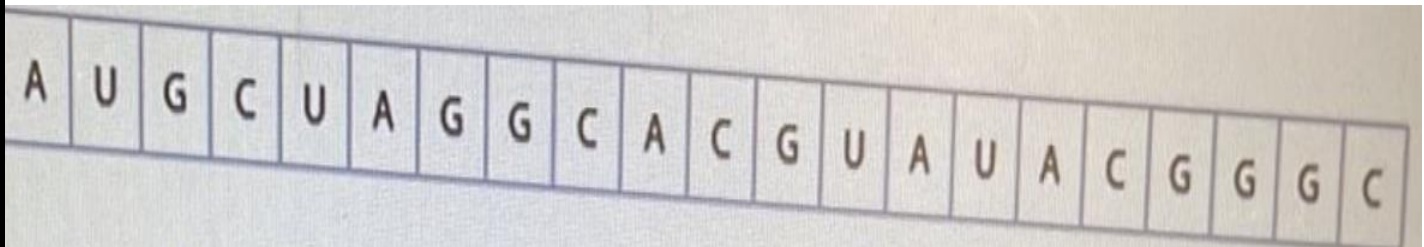
Differences : mRNA tRNA

Straight chain folded

Has codons anti codon

Question 15 :

The diagram shows part of a mRNA base sequence



- a. Give the sequence of the first six bases of the DNA that was transcribed to give this mRNA sequence .

TACGAT

- b. Give the maximum number of amino acids that would be in the part of the polypeptide chain produced from this mRNA base sequence .

7 seven

- c. Give the maximum number of different tRNA molecules that would be needed to produce the polypeptide chain produced from this base sequence .

5 five