

Question 1 [7 marks]

Double-stranded RNA (dsRNA) is RNA with two complementary strands found in cells. In dsRNA viruses, the double-stranded genome is used as a template by the viral RNA dependent RNA polymerase (RdRp) to transcribe a positive-strand RNA functioning as messenger RNA (mRNA) for the host cell's ribosomes, which translate it into viral proteins.

http://en.wikipedia.org/wiki/Double-stranded_RNA

a. Draw and label a dsRNA nucleotide in the space below.

2 marks



b. Compare the structural features and functional role of dsRNA, mRNA and tRNA in dsRNA viruses.

4 marks

Question 1 [7 marks]

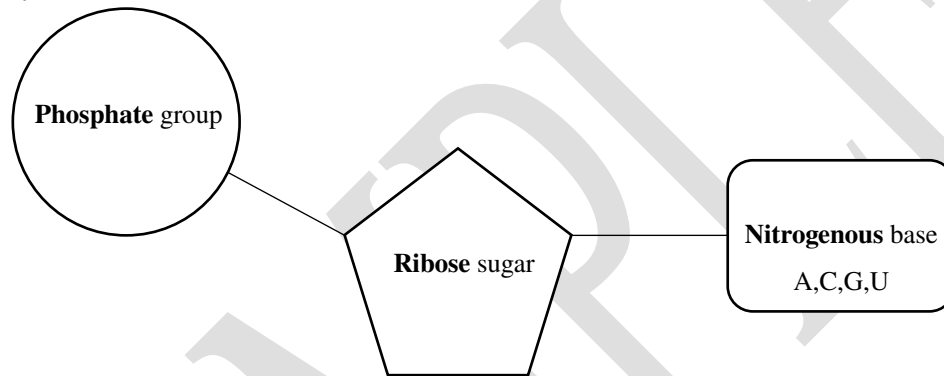
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a. Draw and label a dsRNA nucleotide in the space below.

2 marks

Solution:



- b. Compare the structural features and functional role of dsRNA, mRNA and tRNA in dsRNA viruses.

5 marks

Solution:

*Tip: Break the question down to **structural** + **functional**.*

- **Structural:**
 - (similarity) dsRNA, mRNA and tRNA nucleotides all consist of a phosphate group, ribose sugar and nitrogenous base (A,U,C,G).
 - (difference) dsRNA is double stranded, forming a **double-helix** shape, while mRNA and tRNA are single-stranded.
- **Functional:** *note that all dsRNA, mRNA and tRNA have **different** functions, so we can just list their different functions.*
 - dsRNA contains the **template strand** coding for specific proteins in dsRNA viruses.
 - mRNA carries a **transcribed** copy of dsRNA (*viral*) **gene sequence** to the ribosome.
 - tRNA carries a **specific amino acid** to ribosome during translation, which are joined together to form *viral proteins*.

The **compare** command term asks us to outline both the **similarities and differences** of two or more things.

Make it clear to your assessor that you are *showing* the **similarities and differences**.