**1.** What sequence of processes is carried out by the structure labelled X during translation?



A. Combining with an amino acid and then binding to an anticodon

B. Binding to an anticodon and then combining with an amino acid

C. Binding to a codon and then combining with an amino acid

D. Combining with an amino acid and then binding to a codon

(Total 1 mark)

**2.** The table below shows the codons that determine different amino acids in protein translation.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **First base** | **Second base in codon** | | | | **Third base** |
| **in codon** | **U** | **C** | **A** | **G** | **in codon** |
| U | Phe | Ser | Tyr | Cys | U |
|  | Phe | Ser | Tyr | Cys | C |
|  | Leu | Ser | — | — | A |
|  | Leu | Ser | — | Trp | G |
| C | Leu | Pro | His | Arg | U |
|  | Leu | Pro | His | Arg | C |
|  | Leu | Pro | Gln | Arg | A |
|  | Leu | Pro | Gln | Arg | G |
| A | Ile | Thr | Asn | Ser | U |
|  | Ile | Thr | Asn | Ser | C |
|  | Ile | Thr | Lys | Arg | A |
|  | Met | Thr | Lys | Arg | G |
| G | Val | Ala | Asp | Gly | U |
|  | Val | Ala | Asp | Gly | C |
|  | Val | Ala | Glu | Gly | A |
|  | Val | Ala | Glu | Gly | G |

What is the sequence of the amino acids that is being translated from the following mRNA sequence?

5´ AUGGGUGCUUAUUGGUAA 3´

A. Met-Pro-Arg-Ile-Thr

B. Met-Cys-Ser-Tyr-Trp

C. Met-Gly-Ala-Tyr-Trp

D. Met-Gly-Tyr-Ala-Thr

(Total 1 mark)

**3.** What does the universal nature of the genetic code allow?

A. Change of genetic code in the same species

B. Transfer of genes between species

C. Formation of clones

D. Infection by bacteria

(Total 1 mark)

**4.** (a) State the type of bonds that

(i) connect base pairs in a DNA molecule.

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(1)

(ii) link DNA nucleotides into a single strand.

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(1)

(b) Distinguish between DNA and RNA nucleotides by giving **two** differences in the chemical structure of the molecules.

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(2)

(c) Explain the role of transfer RNA (tRNA) in the process of translation.

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(2)

(Total 6 marks)