

**AQA, OCR, Edexcel**

**A Level**

# **A Level Biology**

**Transcription and Translation  
Questions**

Name:

**M**

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**Total Marks:    /29**

### Transcription & Translation

1. The genetic code is made up of genes. Genes direct the synthesis of proteins which then carry out specific functions in the body.

This question is about transcription and the genetic code.

a) Describe the process of transcription in detail (4 marks)

c) The genetic code is essentially a set of instructions that the cell reads to know which proteins to synthesise.

i) How is the genetic code interpreted by the cell in a way that determines the order of amino acids? (2 marks)

ii) What is a stop codon and how does it work? (2 mark)

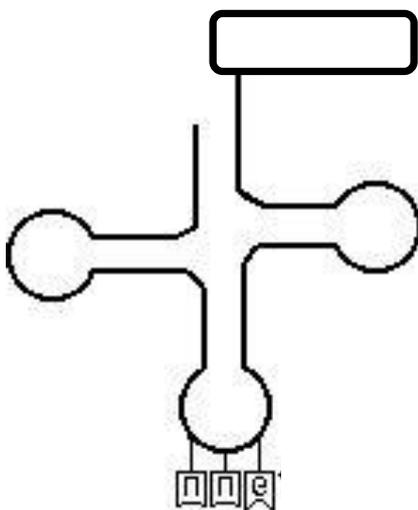
iii) Glycine is coded for by codons GGA, GGU, GGC, GGG, why is this advantageous? (2 marks)

2. Once transcription is complete and the mRNA strand has been formed, it exits the nucleus so the next stage, translation can occur.

a) Why does translation occur in the cytoplasm and not the nucleus? (1 mark)

b)

i) Use the diagram below to describe the structure of a tRNA molecule. (3 marks)



ii) What is the function of the tRNA molecule in translation? (2 marks)

c)

- i) What reaction is required for the formation of the polypeptide chain during translation and why is ADP produced? (3 marks)
- ii) Explain the path that a polypeptide chain, newly synthesised in translation, must take in order to appear in the cell surface membrane as a fully functional receptor or channel protein? (4 marks)

3. The presence of a genetic code is something that is universal across living organisms, and the body's ability to interpret this code allows it to carry out all its necessary functions. Using the section of DNA below, the amino acid table and your knowledge of mRNA, identify what each codon codes for (6 marks).

DNA CODE:  
T A C T G C C G A A G T G A A C A T A T T

	U	C	A	G	
U	UUU } Phe	UCU } Ser	UAU } Tyr	UGU } Cys	U
	UUC } Phe	UCC } Ser	UAC } Tyr	UGC } Cys	C
	UUA } Leu	UCA } Ser	UAA* } Stop	UGA* } Stop	A
	UUG } Leu	UCG } Ser	UAG* } Stop	UGG } Trp	G
C	CUU } Leu	CCU } Pro	CAU } His	CGU } Arg	U
	CUC } Leu	CCC } Pro	CAC } His	CGC } Arg	C
	CUA } Leu	CCA } Pro	CAA } Gln	CGA } Arg	A
	CUG } Leu	CCG } Pro	CAG } Gln	CGG } Arg	G
A	AUU } Ile	ACU } Thr	AAU } Asn	AGU } Ser	U
	AUC } Ile	ACC } Thr	AAC } Asn	AGC } Ser	C
	AUA } Ile	ACA } Thr	AAA } Lys	AGA } Arg	A
	AUG** } Met	ACG } Thr	AAG } Lys	AGG } Arg	G
G	GUU } Val	GCU } Ala	GAU } Asp	GGU } Gly	U
	GUC } Val	GCC } Ala	GAC } Asp	GGC } Gly	C
	GUA } Val	GCA } Ala	GAA } Glu	GGA } Gly	A
	GUG** } Val	GCG } Ala	GAG } Glu	GGG } Gly	G