

Answers to examination-style questions

Answers	Marks	Examiner's tips
1 a) GCAAUG	2	Allow one mark if T instead of U, i.e. GCAATG.
b) i) DNA is edited / introns present in DNA	1	Allow reference to 'or non-coding DNA'.
ii) 220; three bases / nucleotides code for one amino acid;	2	Allow 218 or 219. Allow two marks if correct explanation is given for 218 or 219.
c) mRNA has no base-pairing, tRNA has base-pairing / mRNA linear, tRNA clover-leaf shape; mRNA has no binding site for amino acids, tRNA has; mRNA different for each gene / many kinds, only few / 20 / 64 kinds of tRNA;	2 max.	Accept mRNA longer / larger / more nucleotides than tRNA.
2 a) AGC; TTC;	2	
b) anticodon complementary to codon / reads message on mRNA; specific amino acid; carried / transferred (to ribosome); correct sequence of amino acids along polypeptide;	3 max.	
c) (Met), Phe, Gln, Gln, Lys, Gln, Phe	2	Three/four/five correct = 1 mark; six correct = 2 marks.
3 a) protein made of (chain of) amino acids; each amino acid has its own base code / code; triplet codes;	2 max.	
b) UCA = 2 marks TCA = 1 mark	2	
c) CCG; GGG GGG;	2	
d) changes base sequence; of later triplets / amino acid codes;	2	

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e)	6 max.	
1.		mRNA leaves (nucleus) through nuclear pore;
2.		to ribosome;
3.		tRNA molecules bring amino acids (to ribosome);
4.		specific tRNA molecule for specific amino acid;
5.		anticodon of tRNA corresponds / complementary to codon on mRNA;
6.		peptide bonds form between amino acids;
7.		tRNA detaches and collects another amino acid;
8.		ribosome moves along mRNA;
4 a) i)	1	join / attach nucleotides, to form a strand / along backbone / phosphodiester bonds
ii)	1	ribosome / RER
b) i)	1	CGTTACCAA
ii)	1	CGU UAC CAA
c)	1	substitution
d) i)	1	alanine
ii)	2	(<i>mutation 1</i>) no change (to sequence of amino acids); codon for alanine / degenerate codon / same amino acid coded for;
	2	(<i>mutation 2</i>) (change in sequence) valine replaced by alanine / codon for alanine ; folding / shape / tertiary structure / position of bonds may change;