Solutions

Each answer shows the steps, then the **result**.

2.1

(a)

- messenger RNA (mRNA)

(b)

- transfer RNA (tRNA)

2.2

- `TAC`
- mRNA `AUG`
- anticodon `UAC`; `CGA`
- mRNA `GCU`
- anticodon `CGA`

3.1 B

- A codon is a triplet of mRNA bases coding for one amino acid (or stop)

3.2 B

- A deletion causes a frameshift, changing every later triplet

3.3

(a)

- RNA polymerase binds and the DNA unwinds at the gene; free RNA nucleotides pair with the template strand (A with U); they are joined into mRNA, which leaves the nucleus

(b)

- each tRNA brings a specific amino acid and its anticodon pairs with the matching mRNA codon; the ribosome moves along the mRNA and joins the amino acids by peptide bonds in order

3.4

(a)

- most amino acids are coded by more than one triplet, so the changed triplet may still code for the same amino acid

(b)

- introns are non-coding; if left in they would be translated into wrong/extra amino acids, giving a faulty polypeptide

3.5

(a)

- the strand used is the **template strand** (transcribed strand)
- the other strand is the **non-transcribed strand** (coding strand)

(b)

- 5′ **AUG CCA GUU** 3′: complementary to the template and antiparallel, with U in place of T

(c)

- the same sequence (5′ ATG CCA GTT 3′), except that the mRNA has **U** where the DNA strand has **T**