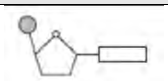
Question Number	Answer	Additional Guidance	Mark
1(a)(i)	C 		(1)

Question Number	Answer	Additional Guidance	Mark
1(a)(ii)	B G-A-U-U-C-A-C-G-U		(1)

Question Number	Answer	Additional Guidance	Mark
1(a)(iii)	C 3 1 4 2		(1)

Question Number	Answer	Additional Guidance	Mark
1(b)(i)	8		(1)

Question Number	Answer	Additional Guidance	Mark
1(b)(ii)	6		(1)

Question Number	Answer	Additional Guidance	Mark
1(c)	1. DNA is {double stranded/ has a double helix} and RNA is {single stranded / does not have a double helix} ; 2. DNA has {thymine / T } while RNA has { uracil / U } ; 3. DNA has deoxyribose while RNA has ribose ; 4. DNA is { larger / longer } than RNA / eq ;	**1. ACC T** mixtures e.g. DNA double helix mRNA is single strand **IGNORE** hydrogen bonds **2.NOT** thiamine, thyamine	(3)

Question Number	Answer	Additional Guidance	Mark
2(a)	idea that the (RNA) nucleotides attach to this strand OR idea of {nucleotide / base } sequence that directs the synthesis of {complementary sequence / mRNA / eq} ;	ACCEPT complementary to RNA nucelotides, codes for mRNA, {part of the DNA / antisense } strand that the mRNA is built along, NOT DNA nucleotides, plural strands	(1)

Question Number	Answer	Mark
2(b)(i)	**D** have a sugar-phosphate chain ;	(1)

Question Number	Answer	Mark
2(b)(ii)	**C** semi-conservative replication is possible ;	(1)

Question Number	Answer	Mark
2(b) (iii)	**A** 10% ;	(1)

Question Number	Answer	Additional Guidance	Mark
2(c)	U G A A A G C G G G C U 1. both uracils correct ; 2. the rest of the sequence correct ;		(2)

<table>
<tr><th>Question Number</th><th>Answer</th><th>Additional Guidance</th><th>Mark</th></tr>
<tr><td>2 (d)</td><td>Any three from:

<table>
<tr><th></th><th>replication</th><th>transcription</th></tr>
<tr><td>1</td><td>uses DNA nucleotides</td><td>uses RNA nucleotides / eq ;</td></tr>
<tr><td>2</td><td>uses DNA polymerase / eq</td><td>does not use DNA polymerase / uses RNA polymerase ;</td></tr>
<tr><td>3</td><td>reference to semi-conservative</td><td>not semi-conservative / eq ;</td></tr>
<tr><td>4</td><td>(copies) both DNA strands / eq</td><td>(copies) only {one strand / template / gene / eq} ;</td></tr>
<tr><td>5</td><td>makes DNA double helix / eq</td><td>Makes single strand mRNA / eq ;</td></tr>
</table>
</td><td>Must be clearly comparative for the mark
IGNORE destination of the molecules

1. ACCEPT thymine / T, uracil / U comparison, deoxyribose and ribose, DNA and RNA bases
2. ACCEPT no ligase in transcription

4. ACCEPT whole DNA molecule unzipped for replication with only part for transcription
ACCEPT all {DNA / genome} copied in replication only part in transcription
5. NOT just produces DNA and mRNA
ACCEPT two {new strands of DNA / DNA molecules} compared to one mRNA (each time)
ACCEPT if clear what is being produced elsewhere in the response</td><td>(3)</td></tr>
</table>