CfE Higher Biology

Unit 1 DNA and the Genome

Key Area Gene Expression

Marking Instructions

1. B
2. C
3. D
4. A
5. A
6. D
7. B
8. B
9. A

10.

a	i	Intron/Intron1/Intron 2	1
a	ii	(Alternative) RNA splicing	1
a	iii	Depending on which RNA segments are treated as exons and introns (1) different segments can be spliced together to produce different mRNA transcripts (1) **or** appropriate example from diagram	2

11.

(a)		Amino acid	1	
(b)		Protein OR Enzymes	1	
(c)		Cut/cleave **AND** combine polypeptide chains OR add phosphate/carbohydrate	1	NOT – *post translational modification* NOT – *cleave/cut* alone
(d)		Name: **Alternative** (RNA) splicing **(1)** Description: Different (combinations of/variety of) **exons** are included/ spliced together (in the mature transcript/ RNA) **(1)**	2	NOT – a description suggesting the order of exons is changed NOT – depends what sections are treated as exons and introns

12.

a		C U C G **(all four)**	**1**		
b		P at (end of longer chain at) top of diagram	**1**		
c		X anticodon **= 1** (Ensures) specific/correct/right/appropriate amino acid is used **OR** (ensure) amino acids are in correct/right/appropriate order/sequence **= 1**	**2**	Not particular	Production of amino acids

13.

a		Introns are non-coding regions/do not code for protein **AND** exon are coding regions/code for protein	**1**	Expression alone. Have codes/code don't have codes/code	
b		RNA polymerase	**1**		
c		(RNA)/(alternative) splicing	**1**		Post-translational modification **OR** any other processes

14.

(a)		Introns	1	NOT- non-coding regions.
(b)		1,3,4/2,3,4	1	Must be in correct order and inversions not acceptable.

15.

(a)	(i)	1. DNA contains deoxyribose RNA contains ribose 2. DNA contains thymine, RNA contains uracil	2	location chain length one has adenine, one has uracil	
	(ii)	Unwinds/unzips the double helix of DNA **= 1** Adds/brings in RNA nucleotides to produce RNA/a primary transcript **= 1**	2	allow hydrogen bond formation	
	(iii)	Introns/non-codong regions are removed **OR** mRNA composed of exons which have been joined together	1	separated from	
	(iv)	(mRNA) carries/takes/transfers the (genetic) code/order of bases/copy of DNA/gene from the nucleus to the cytoplasm/ribosomes	1		
(b)	(i)	9 hours	1		
	(ii)	Human cells are eukaryotic **= 1** Actinomycin D would inhibit transcription/stop/prevent protein synthesis/transcription in a human patient/us/people/the human body **= 1**	2	transcription of proteins	