B1 g-h assessed task

Q1) Put the following into order of size, starting with the smallest:
nucleus *gene* *DNA molecule* *chromosome*

[4]

……..
……..
……..
……..

Q2) Which of the following statements are true? Tick the true ones.

A – Genes are made of a chemical called PNA.
B – Many chromosomes are joined together to form a gene.
C – A nucleus is found inside every chromosome.
D – Most cells contain chromosomes in matching pairs.

[2]

Q3) Circle the following characteristics which are controlled by our genes:

height *eye colour* *scars* *nose shape* *tattoos*

[2]

Q4) The diagram shows how sex is determined.

	X	X
X	XX	XX
Y	XY	XY

a) Which are the sex chromosomes that determine males?
b) Which are the sex chromosomes that determine females?
c) Use the diagram to explain why equal numbers of boys and girls are born.

[3]

Q5) In a new baby, what proportion of genes come from each parent?
Circle the correct answer.

A – all from mum
B – all from dad
C – half from mum and half from dad
D – none from mum or dad

[1]

Q6) Mutations are changes to the DNA in genes.
a) Which of the following can cause mutations to DNA?

water radiation chemicals sound

[1]

b) Explain whether most mutations are harmful or beneficial.

[2]

Q7) Chromosomes are found inside the nucleus.

a) How many chromosomes are found in the nucleus of most human cells?

b) Is this number the same for all living organisms?

c) What is unusual about the number of chromosomes found in all living organisms?

d) If a horse contains 64 chromosomes, how many chromosomes are in its sex cells?

[4]

Q8)
a) How many letters are in the DNA alphabet?

[1]

b) Explain how a complete set of DNA manages to fit inside the nucleus of a cell

[2]

Q9)
a) What do we call a gene that has been changed?

[1]

b) List 2 disorders that can be inherited.

[2]

Q10) The table describes some of Grace's characteristics.

characteristic	Grace
gender	female
eye colour	blue
spoken language	English
scars	one on left leg

(a) Some of Grace's characteristics have been inherited.

Some are caused by her environment.

(i) Write down one characteristic that has been inherited by Grace.

Choose from the table.

..... [1]

(ii) Write down one characteristic caused by Grace's environment .

Choose from the table.

..... [1]

(b) Grace's inherited characteristics are controlled by her chromosomes.

Finish the following sentences about Grace's chromosomes.

Choose words from the list.

cytoplasm DNA egg genes

nucleus protein sperm

Grace's chromosomes are long threads of a chemical called ..... .

They are found in the ..... of every cell in her body.

Chromosomes carry information in sections called ..... .

[3]

c) Grace is pregnant.

The baby will have some of Grace's characteristics.

(i) Explain why the baby will have some of Grace's characteristics.

.....

..... [1]

(ii) Explain why the baby will not have all the same characteristics as Grace.

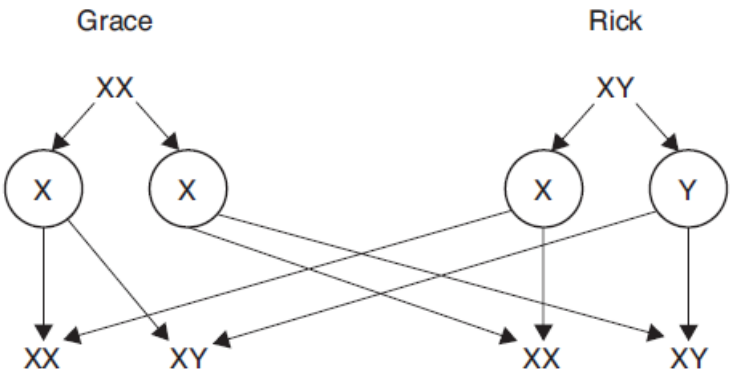
.....

..... [1]

[Total: 7]

d)

The diagram shows how Grace and Rick can pass on their sex chromosomes.



There is an equal chance of Grace and Rick's baby being a boy or a girl.

Explain why.

Use the diagram to help you.

.....

..... [2]

e)

Grace and Rick discover that their baby may have inherited a genetic disorder.

Grace and Rick do not have this genetic disorder.

But they have found out that they are both **heterozygous** (carriers).

Draw a genetic diagram to work out the probability of Grace and Rick's baby having the disorder.

Use **N** for the normal allele and **n** for the allele for the disorder.

probability = ... [3]

f)

Suggest why Grace and Rick's discovery has made them think carefully about having more children.

.....

.....

.....

..... [2]

Q11)

This article appeared in a recent newspaper.

Did some mammoths have blond hair?

Scientists have managed to extract **DNA** from the **cells** of a mammoth that has been dead for 43 000 years.

They have discovered a **gene** that codes for a **protein**.

This protein affects hair colour in humans and other animals.

The mammoth had two versions of the gene.

One is **dominant** and makes hair dark.

The other is **recessive** and makes hair blond.

Six words in the article are in **bold**.

The following are meanings of three of these words.

Write down the best word in the space next to its meaning.

(a) A chemical that makes up chromosomes ..... .

(b) A coded instruction containing a length of genetic code ..... .

(c) A chemical that is made up of amino acids ..... . [3]

Q12) Read the following question about a new discovery made by students.

Then answer the questions that follow.

Scientists have been investigating how ultraviolet (UV) radiation in sunlight can cause mutation.
They have been shining UV radiation at the bases in DNA.
They have found that at least two of the bases, **C** and **T**, can take in the energy from UV light.
The bases then hold on to the energy for longer than originally thought.
The scientists think that this increases the chances of a mutation occurring.

(a) The scientists found results for the bases **C** and **T**.

What letters represent the **other two** bases that are found in DNA?

..... and ..... [1]

(b) When DNA absorbs energy, it might mutate.

How may the structure of DNA change in a mutation?

.....

.....[1]

(c) Why can a mutation change how a cell functions?

.....

.....[1]

(d) Radiation such as UV light can cause mutations.

Apart from UV radiation, write down **one other** cause of mutations.

.....[1]

END OF TEST