ALBERTA BIOLOGY 30 · UNIT C · 10 QUESTIONS

Cell Division, Genetics & Molecular Biology — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **A section of mRNA contains the codon GCU. The base sequence of the tRNA anticodon that pairs with this codon is**

- A CGA
- B GCU
- C UCG
- D CAG

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2 **In fruit flies, red eye colour (R) is dominant to white eye colour (r), and the gene is X-linked. A white-eyed female ($X^r X^r$) is crossed with a red-eyed male (XR Y). The probability that a daughter of this cross will be white-eyed is**

A 0.25

B 0.00

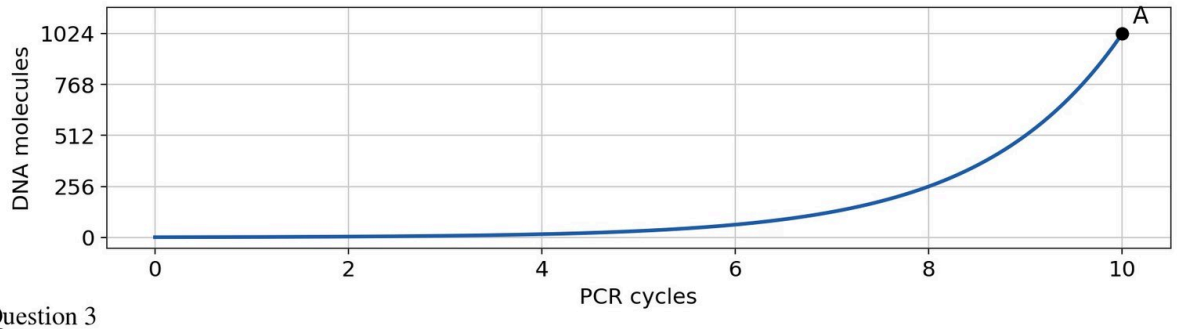
C 0.50

D 1.00

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3

The graph shows DNA molecules during the polymerase chain reaction (PCR), starting from 1 molecule. Point A marks the position after 10 cycles. How many DNA molecules are present at point A? Record your answer as a number.



Question 3

The graph shows DNA molecules during the polymerase chain reaction (*PCR*), starting from 1 molecule. Point A marks the position after 10 cycles. How many DNA molecules are present at point A? Record your answer as a number.

ANSWER

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4 **Manx cats have no tail. The Manx allele (M) is dominant, but kittens with genotype MM die before birth. Two Manx cats are crossed. The proportion of the surviving kittens expected to be Manx is**

- **A** $\frac{1}{4}$
- **B** $\frac{1}{2}$
- **C** $\frac{2}{3}$
- **D** $\frac{3}{4}$

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5 **In cattle, coat colour shows codominance. A roan bull (CR CW) is crossed with a red cow (CR CR). The probability that an offspring will be roan is**

- **A** 0.00
- **B** 0.50
- **C** 0.75
- **D** 1.00

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6 **DNA fragments of different lengths are separated by gel electrophoresis. Fragments of 1200, 400, and 150 base pairs are placed in a gel and an electric current is applied. The fragment that will travel the farthest through the gel is the**

A 1200 base pair fragment

B 400 base pair fragment

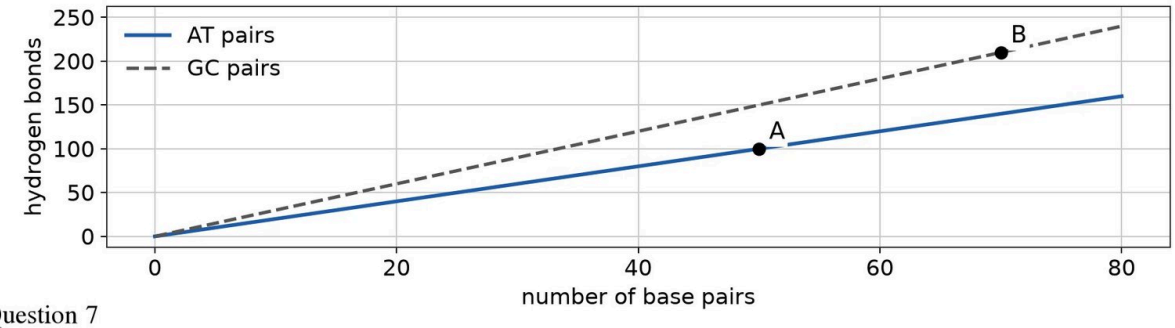
C all three fragments travel the same distance

D 150 base pair fragment

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7

The graph shows hydrogen bonds from adenine-thymine pairs and from guanine-cytosine pairs. Point A is for 50 AT pairs and point B is for 70 GC pairs. A DNA segment contains 50 AT pairs and 70 GC pairs. The total number of hydrogen bonds in this segment is ____. Record your answer as a number.



Question 7

The graph shows hydrogen bonds from adenine – thymine pairs and from guanine – cytosine pairs. Point A is for 50 AT pairs and point B is for 70 GC pairs. A DNA segment contains 50 AT pairs and 70 GC pairs. The total number of hydrogen bonds in this segment is ____. Record your answer as a number.

ANSWER

Understand It with Pulse

Flag a mistake

8 **Genes P and Q are located close together on the same chromosome. A double heterozygote (PpQq) is test-crossed, and most of the offspring show the parental phenotype combinations rather than new combinations. This result occurs because**

- **A** the two genes are linked and are usually inherited together
- **B** the two genes are on different chromosomes and assort independently
- **C** crossing over always separates the two genes in every gamete
- **D** one of the two genes was mutated in the parent

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9 **Siamese cats have dark fur on their ears, paws, and tail, but much lighter fur on the rest of the body. The darker fur on the ears and paws is best explained by**

- **A** a mutation that occurred only in the cells of the ears and paws
- **B** extra copies of the pigment gene in the cells of the ears and paws
- **C** an enzyme that produces pigment and is active only at the cooler temperatures of the extremities
- **D** a lack of blood flow to the ears and paws during development

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10 **In a cross between AaBb and Aabb, the two genes assort independently. The probability that an offspring will have the genotype AAbb is**

A $\frac{1}{16}$

B $\frac{3}{16}$

C $\frac{1}{4}$

D $\frac{1}{8}$

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ANSWER KEY

1.	A	**5.**	B	**9.**	C
2.	B	**6.**	D	**10.**	D
3.	1024	**7.**	310		
4.	C	**8.**	A		

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