

GCSE Biology A (Gateway)

J247/04 Biology A B4-B6 and B7 (Higher Tier)

Question Set 25

Multiple Choice Questions

B5: Genes, Inheritance and Selection

1 A mouse has a diploid chromosome number of 40.

Which row in the table shows the correct number of chromosomes in each cell?

	Number of chromosomes in	
	a mouse egg cell	a mouse eye cell
A	40	40
B	20	20
C	20	40
D	40	20

Your answer

C

[1]

2 FOP is a disorder that causes soft tissue in the body to turn to bone. It is caused by a dominant allele.

People who have this condition are often infertile.

Natural selection predicts that the number of children born with the condition will go down.

Which explanation can explain why the number of people with FOP is staying constant?

- A The allele is being produced regularly by mutation.
- B Dominant alleles can remain hidden for generations.
- C The allele may increase the rate of meiosis.
- D The allele has no effect on a person's phenotype.

Your answer

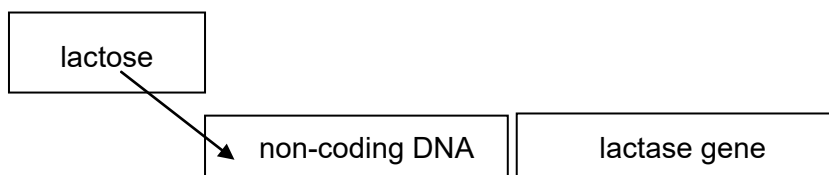
A

[1]

3 Bacteria can produce an enzyme called lactase which digests lactose.

The enzyme is only made when lactose is present.

This is because there is a non-coding area of DNA which switches the lactase gene on.



Bacteria can have a mutation in the non-coding DNA.

What is a possible effect of such a mutation?

- A Lactase cannot be made even if lactose is present.
- B Lactase is made but will have a different order of amino acids.
- C Lactase is made but it will be the wrong shape to digest lactose.
- D Lactase is made rather than lactase.

[1]

Your answer

A

4 Which of these processes can produce a **new** allele?

- A A change in the environment
- B Asexual reproduction
- C Mutation
- D Selective breeding

[1]

Your answer

C

5 Why is the process of meiosis important in making gametes?

- A The cells produced are diploid.
- B The cells produced are genetically identical.
- C The cells produced are much smaller in size.
- D The cells produced have half the number of chromosomes.

Your answer

D

[1]

- 6 What is a genome?
- A A description of the number of chromosomes in an organism.
 - B All the proteins that one organism can produce.
 - C A store of seeds to preserve genetic variation.
 - D The entire genetic material of an organism.
- [1]

- 7 Your answer
- A harmful protein can cause pain in the joints. A new treatment is being developed to stop the protein causing pain.
- What effect would this treatment have on the person's phenotype and genotype?
- A Changes both the phenotype and genotype
 - B Changes the genotype only
 - C Changes the phenotype only
 - D No change to their phenotype or genotype

- 8 Your answer
- Which statement **best** describes the development of the theory of evolution by natural selection?
- A Darwin and Mendel working together
 - B Darwin and Wallace working independently
 - C Darwin and Wallace working together
 - D Mendel working on his own
- [1]

- 9 Your answer
- Which approach would be used to classify organisms by phylogenetics?
- A Compare the structure of the organisms' internal organs
 - B Look at DNA base sequences
 - C Look at the behaviour of the organisms
 - D Study fossils

- Your answer
- [1]

10 What was Mendel's contribution to modern genetics?

- A He developed the theory of natural selection.
- B He discovered that most characteristics are controlled by multiple genes.
- C He worked out how sex determination occurs in mice.
- D He found a pattern that shows how characteristics are passed on.

Your answer

D

[1]

11 Which of these is a feature of an **artificial** classification system?

- A It shows evolutionary links between organisms.
- B It can be based on similarities in DNA.
- C It may compare the amino acids in proteins.
- D It uses a single difference or similarity between organisms.

Your answer

D

[1]

12 How does the fossil record provide evidence for evolution?

- A It provides information about **all** extinct organisms.
- B It shows that all organisms have evolved at the same rate.
- C It shows that many small changes can result in a large change in organisms over time.
- D It shows that changes in phenotype occurring during life can be passed on in the genes.

E

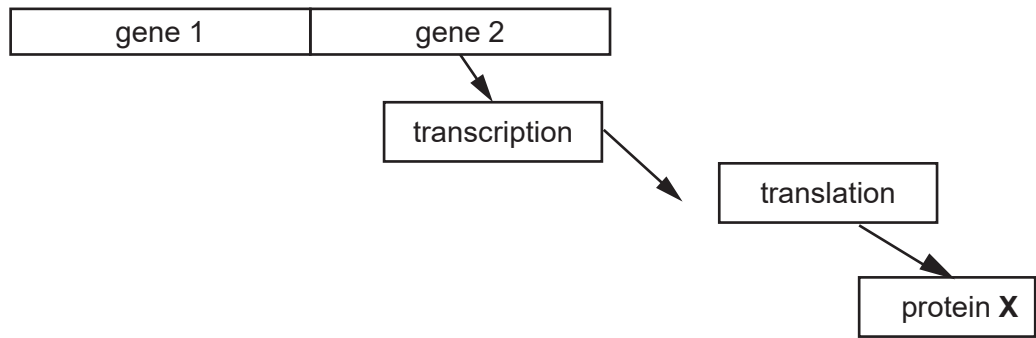
Your answer

C

[1]

13

Gene 1 and gene 2 are both needed for the production of protein X.



What is the function of **gene 1** in this process?

- A It codes for the amino acids in protein X.
- B It codes for the mRNA needed to make protein X
- C It acts as the site for protein synthesis.
- D It controls the expression of **gene 2**.

Your answer

B

[1]

Total Marks for Question Set B5: 13

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