Variation

(MUF0031 Biology Unit 2 Past Year Topical Questions)

Sample Exam Paper

Question 15

Identify the most likely selective pressure that drove the evolution of white fur in polar bears.

A White fur improves camouflage in the snow and increases the success of hunting seals.

B White fur reflects sunlight and helps prevent overheating.

C White fur is not genetically inherited but is a result of excessive sun bleaching.

D White fur does not produce as much oil as brown fur, so it is less water resistant.

Question 16

A number of iguana species live on the Galapagos Islands.

Images from: Shutterstock

The left image shows an iguana that lives on land. The right image shows an iguana species that swims and forages for food underwater. It is likely that both of the Galapagos iguanas evolved from a single ancestral species.

This is an example of

A analogous structures.

B bottleneck effect.

C divergent evolution.

D genetic drift.

Question 17

Which one of the following adaptations distinguishes primates from other mammals?

A Production of milk by females to feed offspring

B Fur or hair covering the body

C Opposable digits on hands and/or feet

D Eye structure to allow for night vision

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Mitosis & Meiosis

(MUF0031 Biology Unit 2 Past Year Topical Questions)

Sample Exam Paper

Question 3

Below is a photograph of a cell during cell division.

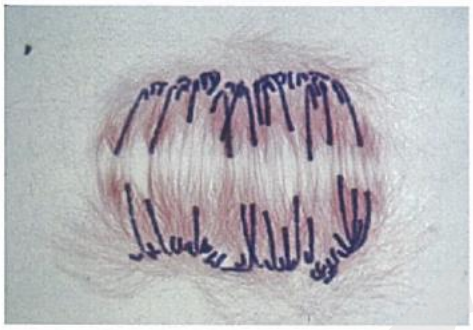


Image from: Andrew S. Bajer, University of Oregon, Eugene, OR

Identify the stage of division the cell is most likely at.

A Anaphase I of meiosis

B Anaphase of mitosis

C Cytokinesis of meiosis

D Cytokinesis of mitosis

Question 4

A normal somatic cell of a sunflower plant contains a total of 34 chromosomes. The total of chromosomes in a normal sunflower sperm cell is

A 1

B 17

C 34

D 68

Question 12

A genetic process heats a target sequence of DNA and separates the strands. Primers are added and bind to the DNA as it cools. A heat resistant form of polymerase adds free nucleotides to the sequence to create new copies. The process can be repeated to form multiple copies of the same sequence.

This process is called

A DNA hybridisation.

B DNA replication.

C Polymerase chain reaction.

D Transcription.

Question 13

The following diagram shows the exposed sequence of DNA after it was cut with a restriction enzyme.

Which one of the following sequences could be joined to the sequence pictured above, in the presence of an appropriate ligase?

A
5' ... G A T C C G T A ...
3' ... C T A G G C A T ...

B
5' ... C T A G G C A T ...
3' ... G A T C C G T A ...

C
5' ... A C G T T A C G ...
3' ... T G C A A T G C ...

D
5' ... T G C A A T G C ...
3' ... A C G T T A C G ...

Inheritance & Characteristics

(MUF0031 Biology Unit 2 Past Year Topical Questions)

Sample Exam Paper

Question 5

A type of plant produces flowers of either yellow or orange. The orange allele is dominant over the yellow allele. A test cross was carried out with an orange flowering plant to determine if it could be used to breed yellow flowering plants. The 10 offspring plants from this test cross all had orange flowers.

Which of the following is the **BEST** conclusion based on the results?

A With 100% of offspring showing orange flowers, the unknown parent must be heterozygous for flower colour.

B Not enough offspring were produced to conclusively determine whether the unknown parent is homozygous or heterozygous.

C Yellow flowers is a rare mutation and it is not possible to deliberately breed yellow flowering plants.

D With 100% of offspring showing orange flowers, the unknown parent must be homozygous for yellow flower colour.

Question 6

In a dihybrid cross between two individuals that are heterozygous for both genes, an F_1 phenotype ratio of 9:3:3:1 would indicate that

A at least one of the genes is showing incomplete dominance.

B one of the genes has three alleles.

C the two genes are sorting independently.

D the two genes are controlling a polygenic character.

Question 7

A polygenic character is controlled by two different genes. Each gene shows complete dominance. Each gene has two alleles. How many possible genotypes are there for this character?

A 2

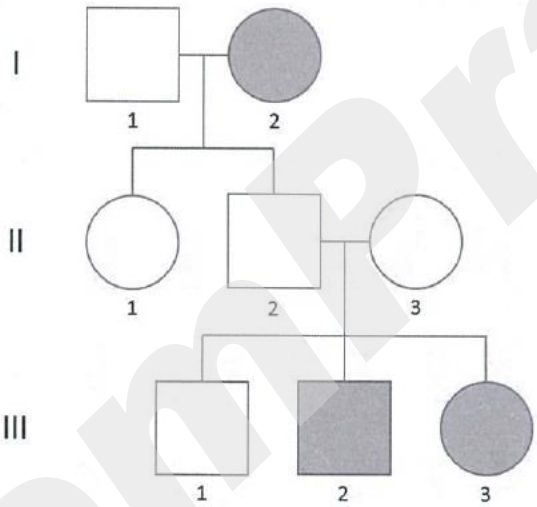
B 6

C 8

D 9

Question 8

The disorder shown in the pedigree below is **NOT** an X-linked recessive disorder.



Which one of the following pieces of evidence supports this claim?

A If the disorder was X-linked recessive, then individual II2 would have inherited the disorder from his mother.

B If the disorder was X-linked recessive, then individual II1 would have inherited the disorder from her mother.

C If the disorder was X-linked recessive, then it is not possible for individual III2 to have the disorder.

D If the disorder was X-linked recessive, then it is not possible for individual III3 to have the disorder.

Question 14

A gene for coat colour in dogs has two alleles – B (black fur) and b (brown fur). In a population of 10 black dogs, only 5 of the dogs have the genotype BB.

What is the allele frequency of the B allele in this gene pool?

A 25%

B 50%

C 75%

D 100%