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TOPICS 3–5 | BLM 1-16

ASSESSMENT

Topics 3–5 Test

Goal • Demonstrate your understanding of the concepts presented in Topics 3–5.

What to Do

Read each question carefully before answering in the space provided. If you work at a steady pace, you should have enough time to finish.

Definitions

Define each term. Use full sentences.

1. clone

- an identical copy of a (molecule), gene, cell or entire organism

2. discrete variation

- inherited traits that have a limited number of variations, such as the ability or inability to roll one's tongue

3. mutagen

an agent that can cause changes in genetic information, (DNA) of an organism

4. genetic engineering

the artifical introduction of genes from one organism into the genetic material of another organism.

True or False

In the space provided, indicate whether each statement is true (T) or false (F).

F	5. Binary fission is a primitive form of sexual reproduction.
T	6. Flowering plants can reproduce sexually and asexually.
F	7. Tongue rolling is an example of continuous variation.
F	8. Genetic mutations are always passed on to the next generation.
F	9. A human gamete has twice the number of chromosomes of a human body cell.
T	10. Sexual reproduction requires more energy than asexual reproduction.
F	11. In general, blue eyes are dominant to brown eyes.

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Topics 3–5 Test (continued)

Fill in the Blanks

12. Complete each statement with the correct term.
    (a) Angiosperms differ from other seed plants because they produce seeds inside fruits.
    (b) In animals, the sperm and egg join to form a zygote in a process known as fertilization.
    (c) When mixed with a dominant trait, a recessive trait does not show up in the offspring.
    (d) Changes to the DNA, the genetic material, are called mutations.

Multiple Choice

Circle the best answer for each of the following questions.

13. In angiosperms, the gametes are carried in the:
    (a) ovary, anther, and style
    (b) ovary, anther
    (c) filaments, anthers, pistils
    (d) pollen grains, ovules

14. Two requirements must be met in order for sexual reproduction to succeed:
    (a) both the male and female gametes must arrive at the same place at the same time
    (b) the zygote must receive enough food and moisture
    (c) the offspring must be clones of the parents
    (d) both (a) and (b) above

15. Which of the following types of human traits is influenced by both "nature" and "nurture"?
    (a) ABO blood group
    (b) body weight
    (c) attached or unattached earlobes
    (d) bent-back thumb or straight thumb

16. Which of the following human traits cannot be inherited?
    (a) certain behaviours
    (b) scars
    (c) blue eye colour
    (d) pointed hairline

17. In the formation of the gametes, cell division
    (a) occurs once
    (b) occurs twice
    (c) occurs four times
    (d) occurs before the DNA is replicated

18. Transgenic mammals are used to produce human proteins because
    (a) transgenic animals cannot pass on the genes for human proteins to their offspring
    (b) the proteins can be collected in the animal's milk
    (c) animals can produce large, complex proteins
    (d) both (b) and (c) above

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Topics 3–5 Test (continued)

Short Answer

19. Indicate whether the following methods of reproduction are asexual (A) or sexual (S).
   A (a) budding
   A (b) vegetative growth in plants
   S (c) conjugation in bread mould to form zygospores
   S (d) seed formation
   A (e) binary fission

20. Describe one way in which genetic engineering is used in food production.
Genetically engineered bacteria and mammals to produce proteins for use in medicine; Salmon that are genetically engineered for rapid growth or to resist the cold.

21. Explain why cross-pollination produces more genetic variation in the offspring than self-pollination produces.
In cross-pollination, genetic information from two different parents is combined in the offspring. No new recombinations result from self-pollination, since both gametes come from the same parent.

22. Why might internal fertilization be a useful adaptation for life on land?
In order to survive, the gametes must not dry out. The gametes must also be able to meet. Internal fertilization provides adequate moisture and protection for the gametes and for the sperm to swim to the egg.

23. Why might scientists use clones to learn about inherited traits?
Clones have identical genetic information. By studying clones, scientists can try to determine which traits are due to genetics; which are due to environmental.

Long Answer

24. Describe two advantages and one disadvantage of asexual reproduction using at least one type of organism as an example.
Asexual reproduction allows for rapid reproduction in relatively static environmental conditions. There is no need to find a mate, and compared to sexual reproduction, the amount of energy invested in reproduction is fairly low. However, asexual reproduction itself does not contribute to variation in the species. In changing environmental conditions, sexually reproducing species would be more able to adapt, since there would be more genetic variation in a sexually reproducing population than one that reproduces asexually.