

BIG IDEA 2.E Formatives**Multiple Choice**

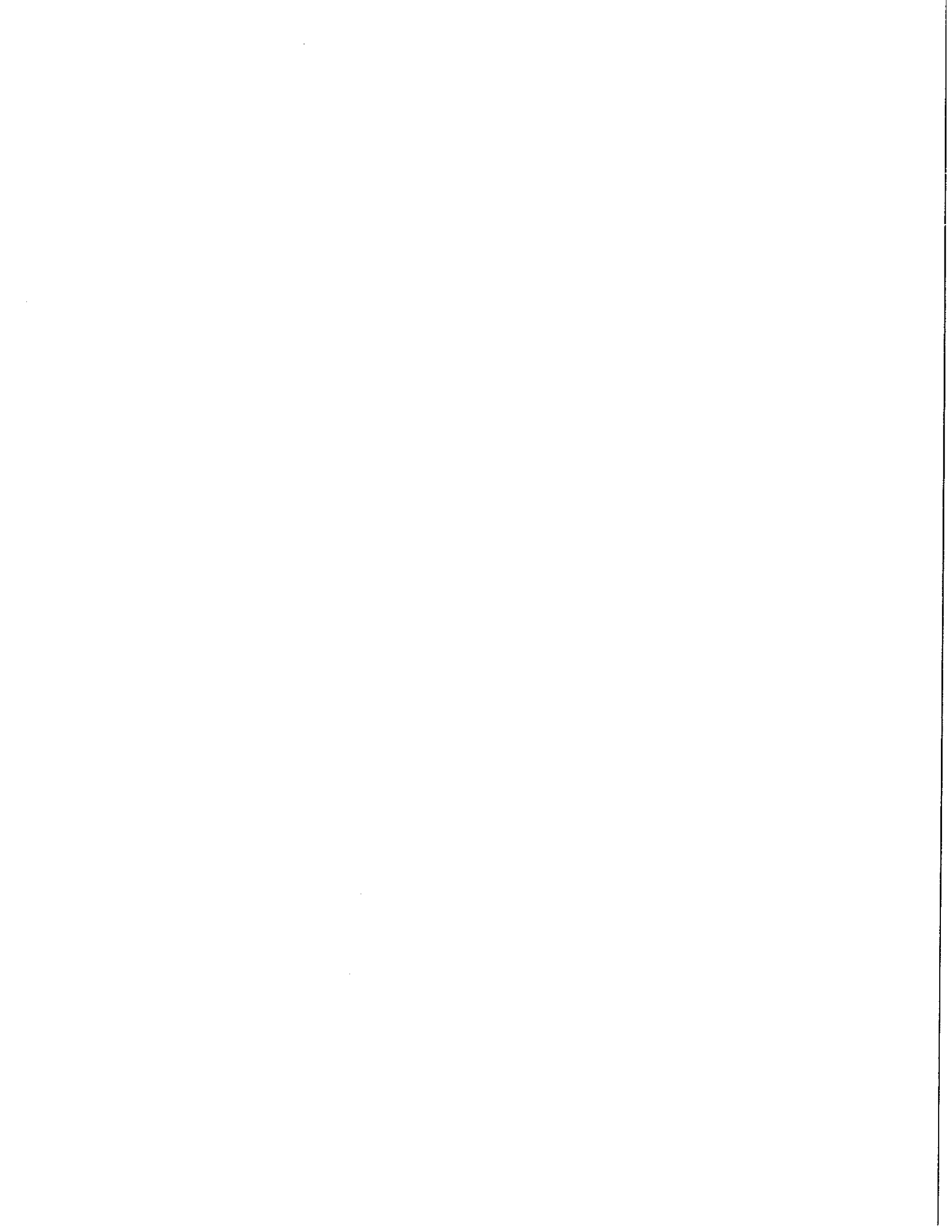
Identify the letter of the choice that best completes the statement or answers the question.

- _____ 1. Differentiation of cells is not easily reversible because it involves
- changes in the nucleotide sequence of genes within the genome.
 - changes in chromatin structure that make certain regions of the genome inaccessible.
 - chemical modifications of histones and DNA methylation.
 - B and C only
 - A, B, and C
- _____ 2. In most cases, differentiation is controlled at the level of
- replication of the DNA.
 - nucleosome formation.
 - transcription.
 - translation.
 - post-translational activation of the proteins.
- _____ 3. Which of the following serve as sources of developmental information?
- cytoplasmic determinants such as mRNAs and proteins produced before fertilization
 - signal molecules produced by neighboring cells
 - ubiquitous enzymes such as DNA polymerase and DNA ligase
 - A and B only
 - A, B, and C
- _____ 4. The general process that leads to the differentiation of cells is called
- determination.
 - specialization.
 - identification.
 - differentialization.
 - cellularization.
- _____ 5. Which of the following involves apoptosis?
- Interactions between muscle cells and bone cells guide the growth of the muscle to a specific location so that it can attach to the bone.
 - Cells from the top of the mouth combine with cells from the base of the brain to form the pituitary.
 - A gonad begins as an undifferentiated organ that can form either an ovary or a testis. The formation depends on the hormonal signals that control the growth of some cells and the death of others.
 - If part of the developing spinal cord in a frog embryo is transplanted to under the skin of its back, it will stimulate development of an eye in that location.
 - The bones of the spinal column develop from blocks of undifferentiated tissue called somites.
- _____ 6. In vertebrates, programmed cell death is essential for all of the following *except*
- normal development of the nervous system.
 - normal operation of the immune system.
 - normal morphogenesis of human feet.
 - normal removal of damaged cells.
 - normal triggering of the signal transduction pathways.

- _____ 7. Which of the following is *not* true concerning homeotic genes?
- They are found in all animals, but nothing like them exists in plants.
 - A specific 180-nucleotide DNA sequence is common to all of the genes.
 - They were first identified in *Drosophila* by Edward Lewis.
 - The peptide gene product is a regulatory protein that controls transcription.
 - A mutation may cause alterations in the identity of body segments.
- _____ 8. The first step in the germination of a seed is usually
- pollination.
 - fertilization.
 - imbibition of water.
 - hydrolysis of starch and other food reserves.
 - emergence of the radicle.
- _____ 9. A puppy is born with a malformed right leg. A veterinarian studies the animal and determines that all of the correct types of cells are present, but that the leg simply took on the wrong shape. This is most likely a problem of
- morphogenesis.
 - cell differentiation.
 - histogenesis.
 - preformation.
 - fertilization.
- _____ 10. As an embryo develops, new cells are formed and different types of cells develop by the process of
- differentiation and morphogenesis.
 - preformation and cell differentiation.
 - cell division and differentiation.
 - preformation and morphogenesis.
 - preformation and epigenesis.
- _____ 11. Which of the following statements is (are) true of plants?
- Unlike animals, plants cannot respond to stimuli.
 - Plants are stationary and are incapable of movement.
 - Plants adjust their growth and development in response to environmental cues.
 - Only A and B are true.
 - A, B, and C are true.
- _____ 12. Seed packets give a recommended planting depth for the enclosed seeds. The most likely reason some seeds are to be covered with only 1/4 inch of soil is that the
- seedlings do not produce a hypocotyl.
 - seedlings do not have an etiolation response.
 - seeds require light to germinate.
 - seeds require a higher temperature to germinate.
 - seeds are very sensitive to waterlogging.
- _____ 13. In legumes, it has been shown that "sleep" movements are correlated with
- positive thigmotropisms.
 - rhythmic opening and closing of K^+ channels in motor cell membranes.
 - senescence (the aging process in plants).
 - flowering and fruit development.
 - ABA-stimulated closing of guard cells caused by loss of K^+ .

- _____ 14. Biological clocks cause organisms to perform daily activities on a regular basis. Which of the following is a *false* statement about this kind of "circadian rhythm"?
- It may have the same signal transduction pathway in all organisms.
 - It must be reset on a daily basis.
 - It may help to cause photoperiodic responses.
 - Once set, it is independent of external signals.
 - The exact mechanism of biological clocks remains unknown.
- _____ 15. The biological clock controlling circadian rhythms must ultimately
- depend on environmental cues.
 - affect gene transcription.
 - stabilize on a 24-hour cycle.
 - speed up or slow down with increasing or decreasing temperature.
 - do all of the above.
- _____ 16. Plants often use changes in day length (photoperiod) to trigger events such as dormancy and flowering. It is logical that plants have evolved this mechanism because photoperiod changes
- are more predictable than air temperature changes.
 - alter the amount of energy available to the plant.
 - are modified by soil temperature changes.
 - can reset the biological clock.
 - are correlated with moisture availability.
- _____ 17. Sow bugs become more active in dry areas and less active in humid areas. This is an example of
- taxis.
 - tropism.
 - kinesis.
 - cognition.
 - net reflex.
- _____ 18. You turn on a light and observe cockroaches scurrying to dark hiding places. What have you observed?
- taxis
 - learned behavior
 - migration
 - visual communication
 - operant conditioning
- _____ 19. Which statement below about mating behavior is *incorrect*?
- Some aspects of courtship behavior may have evolved from agonistic interactions.
 - Courtship interactions ensure that the participating individuals are nonthreatening and of the proper species, sex, and physiological condition for mating.
 - The degree to which evolution affects mating relationships depends on the degree of prenatal and postnatal input the parents are required to make.
 - The mating relationship in most mammals is monogamous, to ensure the reproductive success of the pair.
 - Polygamous relationships most often involve a single male and many females, but in some species this is reversed.

- _____ 20. One way to understand how early environment influences differing behaviors in similar species is through an experimental technique known as "cross fostering." Suppose that the curly-whiskered mud rat differs from the bald mud rat in several ways, for example curly-whiskered rats are much more aggressive. How would you set up a cross-fostering experiment to determine if environment plays a role in this mud rat's aggression?
- a. You would cross curly-whiskered mud rats and bald mud rats and hand-rear the offspring.
 - b. You would place newborn curly-whiskered mud rats with bald mud rat parents, newborn bald mud rats with curly-whiskered mud rat parents, and let some mud rats of both species be raised by their own species. Then compare the outcomes.
 - c. You would remove the offspring of curly-whiskered mud rats and bald mud rats from their parents and raise them in the same environment.
 - d. You would see if curly-whiskered mud rats bred true for aggression.
 - e. None of these schemes describes cross fostering.



**BIG IDEA 2.E Formatives
Answer Section****MULTIPLE CHOICE**

- | | |
|------------|-------------------|
| 1. ANS: D | TOP: Concept 21.2 |
| 2. ANS: C | TOP: Concept 21.2 |
| 3. ANS: D | TOP: Concept 21.2 |
| 4. ANS: A | TOP: Concept 21.2 |
| 5. ANS: C | TOP: Concept 21.3 |
| 6. ANS: E | TOP: Concept 21.3 |
| 7. ANS: A | TOP: Concept 21.3 |
| 8. ANS: C | TOP: Concept 38.2 |
| 9. ANS: A | TOP: Overview |
| 10. ANS: C | TOP: Overview |
| 11. ANS: C | TOP: Concept 39.1 |
| 12. ANS: C | TOP: Concept 39.3 |
| 13. ANS: B | TOP: Concept 39.3 |
| 14. ANS: D | TOP: Concept 39.3 |
| 15. ANS: B | TOP: Concept 39.3 |
| 16. ANS: A | TOP: Concept 39.3 |
| 17. ANS: C | TOP: Concept 51.1 |
| 18. ANS: A | TOP: Concept 51.1 |
| 19. ANS: D | TOP: Concept 51.2 |
| 20. ANS: B | TOP: Concept 51.3 |