

Part C

- 21. Two different sources of variation in a population are mutation and the random arrangement and sorting of chromosomes during meiotic cell division.
- 22. The type of selection for racehorses is different from the selection for giraffes because humans are selecting to breed the horses that have the traits we find desirable or useful to us, while “nature” is selecting the giraffes that have what it takes to survive in the environment.
- 23. The two events of sexual reproduction that produce the variations upon which natural or artificial selection is based are meiosis and fertilization. Meiosis “shuffles” the genetic material available and randomly distributes half of it to each gamete. The particular sperm and egg that combine at fertilization is another random process, each combination being unique.
- 24.

Feature of Evolution	Example
Variation	Ancient populations of giraffes varied in the relative lengths of their body parts.
Struggle for existence	Giraffes compete for food, especially during droughts.
Survival of the fittest	Those that can browse the highest are most likely to survive.

- 25. Gradualism suggests that the changes are slow and continuous, while punctuated equilibrium suggests there are long periods of no change and some short periods of rapid change.
- 26. Gradualism suggests that the accumulation of small variations results in new species.
- 27. The presence of transitional or intermediate forms in fossils indicates that evolutionary change may occur in a time frame known as gradualism.
- 28. The female turtle may dig two holes because it is confusing for predators attempting to dig up the eggs.
- 29. The turtles in the past who dug two holes had a greater number of offspring survive. Those offspring inherited the trait from their parents and continued the process.
- 30. The variation of resistance to the insecticide in the cockroaches most likely came about by a mutation in the sex cells of a cockroach in the past.
- 31. Since the insecticide kills many more of the nonresistant ones, many of the resistant ones survive and reproduce, having offspring that are also resistant.
- 32. When the streptomycin was added, it acted as a selection agent, leaving mostly the resistant ones alive to reproduce and pass on their resistance to their offspring.
- 33. The substance that is responsible for the resistance and allows it to be passed to offspring is DNA.
- 34. *E. coli* have a very rapid reproductive rate. This allows them to go from just a few survivors with the resistance to a huge population with the resistance in a very short time.

- 35. If *Titanotheres* changed to get larger over time, periods when lots of food was available and other periods when food was very scarce may have favored those who could eat a lot and create huge fat reserves to store it for the times when no food was available.
- 36. The *Titanotheres*’ large size may have made them less able to get away from predators, leading to their extinction.

ANSWERS TO REVIEW QUESTIONS–TOPIC 6

Review Questions

- 1. 3 2. 1 3. 1
- 4. 1 5. 2 6. 3
- 7. 2 8. 2 9. 4
- 10. 1 11. 3 12. 3
- 13. 3 14. the rosebush 15. 4
- 16. The number of toads would decrease.
- 17. 4 18. 3 19. 3
- 20. 1 21. 1 22. 4
- 23. 1 24. 2 25. 1
- 26. 1 27. 4 28. 2
- 29. 3 30. 4 31. 2
- 32. 2 33. 2 34. 2
- 35. 3 36. 3 37. 1
- 38. 3 39. 1
- 40. The pesticide killed the bees and other insects that pollinate the flowers. Without pollination of the flowers, no berries would form.
- 41. The line should be drawn from the lower left corner up to the upper right corner of the graph.
- 42. 2
- 43. As we lose biodiversity, we lose organisms that might have been a source of medicines to treat or cure human diseases.
- 44. If a disease infects the plants, they will all get it since they are genetically alike, and the crop will probably be lost. In a diverse group of plants, some would probably have some resistance to the disease, which could save at least some of the crop.
- 45. 1 46. 1 47. 4
- 48. 1
- 49. The area would probably first become a field, then slowly go through a succession of stages from the field to a forest environment again in several hundred years. In fifty years, the area may only be in the shrub or early tree stage.
- 50. 1
- 51. The soil got deeper and drier as the lake receded; therefore, it was able to support the growth of these tree species, which would produce too much shade for the grasses to grow there.
- 52. 2 53. 4 54. 3
- 55. 4

Regents Practice

Part A

- 1. 4 2. 3 3. 4
- 4. 4 5. 3 6. 3