Chapter 2: Biological and Environmental Foundations and Prenatal Development

Test Bank

Multiple Choice

1. The nucleus of every human cell contains 46 structures called _____.
a. chromosomes
b. gametes
c. alleles
d. genes
Ans: A
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Knowledge
Answer Location: Genetics
Difficulty Level: Easy

2. The cells for sexual reproduction are called _____.
a. chromosomes
b. gametes
c. zygotes
d. alleles
Ans: B
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Knowledge
Answer Location: Cell Reproduction
Difficulty Level: Easy

3. Which differentiates mitosis from meiosis?
a. Mitosis is cell reproduction only for the sex cells.
b. Meiosis is the cell reproduction for most all of the cells in the human body.
c. Mitosis is the cell reproduction for most all of the cells of the human body.
d. Meiosis is the reproduction for cells such as the sickle cell trait.
Ans: C
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Analysis
Answer Location: Cell Reproduction
Difficulty Level: Medium

4. The process in which most cells reproduce in the human body is _____.
a. polygenic inheritance
b. genomic imprinting

c. meiosis
d. mitosis
Ans: D
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Knowledge
Answer Location: Cell Reproduction
Difficulty Level: Easy

5. A zygote is defined as_____.
a. the cells for sexual reproduction
b. the set of specific instructions for all physical characteristics
c. the fertilized egg cell once the sperm and ovum have joined
d. the rod-shaped structures
Ans: C
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Knowledge
Answer Location: Cell Reproduction
Difficulty Level: Easy

6. _____ is the process in which most cells in the human body reproduce.
a. Mitosis
b. Meiosis
c. Polygenic inheritance
d. Genomic imprinting
Ans: A
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Knowledge
Answer Location: Cell Reproduction
Difficulty Level: Easy

7. Which is classified as a gamete?
a. Ovum
b. Allele
c. Chromosomes
d. Zygote
Ans: A
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Comprehension
Answer Location: Sex Determination
Difficulty Level: Medium

8. Twins Martin and Ian both have green eyes, brown hair, and a fair skin tone. As they grow, Ian begins to tower over Martin in height. He is also heavier in weight. Martin's eye color changes to a hazel color while Ian's remains green. Ian's hair color continues to darken while Martin's becomes a lighter brown. By age three, they look distinctly different physically. Martin and Ian are _____.

a. dizygotic
b. monozygotic
c. dominant
d. polygenic
Ans: A
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Application
Answer Location: Genes Shared by Twins
Difficulty Level: Hard

9. Which inference can be drawn from a set of twins who have different eye color, hair color, and nose shape?
a. They are monozygotic twins.
b. They are dizygotic twins.
c. They have the same DNA.
d. They have the same range of reaction.
Ans: B
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Analysis
Answer Location: Genes Shared by Twins
Difficulty Level: Medium

10. A researcher interested in studying twins who originated from one zygote would focus on _____.
a. dizygotic twins
b. monozygotic twins
c. mitosis
d. meiosis
Ans: B
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Comprehension
Answer Location: Genes Shared by Twins
Difficulty Level: Medium

11. Jamal has blond hair but neither of his parents have blond hair. They both have brown hair. He has green eyes, which both of his parents express. In order for Jamal to have blond hair, he must have inherited _____.
a. one recessive gene for hair color
b. one dominant gene for hair color
c. two dominant genes for hair color
d. two recessive genes for hair color
Ans: D
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Application
Answer Location: Dominant-Recessive Inheritance
Difficulty Level: Hard

12. Sophie is doing a science experiment for school. She decides to look at dominant and recessive inheritance in flowers. She grows some yellow and red daisies. She cross pollinates them to see which color would be dominant. Instead, she gets orange flowers. This illustrates _____.
a. polygenic inheritance
b. dominant-recessive inheritance
c. incomplete dominance
d. genomic imprinting
Ans: C
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Application
Answer Location: Incomplete Dominance
Difficulty Level: Hard

13. _____ is a genetic inheritance pattern in which the stronger allele does not overtake the expression of the weaker allele.
a. Dominant-recessive inheritance
b. Polygenic inheritance
c. Genomic Imprinting
d. Incomplete dominance
Ans: D
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Knowledge
Answer Location: Incomplete Dominance
Difficulty Level: Easy

14. Researchers who are interested in weaker alleles showing up against a dominant allele would focus on _____.
a. gametes
b. meiosis
c. sickle cell trait
d. incomplete dominance
Ans: D
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Comprehension
Answer Location: Incomplete Dominance
Difficulty Level: Medium

15. Scientists interested in personality trait inheritance would focus on _____.
a. polygenic inheritance
b. dominant-recessive inheritance
c. meiosis
d. sickle cell trait
Ans: A
Learning Objective: 2.1: Discuss the genetic foundations of development.

Cognitive Domain: Comprehension
Answer Location: Polygenic Inheritance
Difficulty Level: Medium

16. Which differentiates polygenic inheritance from dominant-recessive inheritance?
a. Dominant-recessive inheritance cannot be traced to just one or two genes.
b. Polygenic inheritance cannot be traced to just one or two genes.
c. One dominant gene will always be expressed.
d. A recessive gene will only express if it is carried on multiple genes.
Ans: B
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Analysis
Answer Location: Polygenic Inheritance
Difficulty Level: Medium

17. Kumar is studying genetic heredity. He is using his family tree as the basis for understanding height. He is 5’9" tall ,while his mother is considerably shorter. He looks back to his maternal grandparents and sees that they are significantly taller than his mother. As he looks at his father’s side of the family, there seems to be no patterns as to height in the family. Since he cannot see a dominant-recessive relationship, he determines that height must be _____.
a. niche-picking
b. polygenic
c. incomplete
d. genomic
Ans: B
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Application
Answer Location: Polygenic Inheritance
Difficulty Level: Hard

18. Which refers to an abnormality passed through inheritance from the mother and/or the father?
a. Canalization
b. Range of reaction
c. Genetic disorder
d. Alleles
Ans: C
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Knowledge
Answer Location: Chromosomal and Genetic Problems
Difficulty Level: Easy

19. A common recessive disorder tested for at birth is _____.
a. Phenylketonuria

b. Fragile X
c. Down Syndrome
d. Huntington's disease
Ans: A
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Knowledge
Answer Location: Dominant-Recessive Disorders
Difficulty Level: Easy

20. How would you classify Phenylketonuria?
a. Dominant
b. Recessive
c. Monozygotic
d. Dizygotic
Ans: B
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Analysis
Answer Location: Dominant-Recessive Disorders
Difficulty Level: Medium

21. Which factor differentiates Huntington's disease from other dominant genetic disorders?
a. Huntington's disease can be viewed on an ultrasound.
b. Huntington's disease is also epigenetic.
c. Huntington's disease is a third chromosome on the 21st pair.
d. Huntington's disease symptoms do not present themselves until age 35 or after.
Ans: D
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Analysis
Answer Location: Dominant-Recessive Disorders
Difficulty Level: Medium

22. Jamal is a hemophiliac. His blood does not clot normally. This disorder is not expressed by either of his parents. His parents have told him that his disorder is genetic and recessive. In science class, they are learning about dominant-recessive genes. Jamal has recently discovered that something recessive on the X chromosome can override the Y. This illustrates his understanding of a(n) _____.
a. epigenetic disorder
b. range of reaction
c. allele
d. X-linked disorder
Ans: D
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal

abnormalities.
Cognitive Domain: Application
Answer Location: X-Linked Disorders
Difficulty Level: Hard

23. Ryan was recently diagnosed as being on the autistic spectrum. When he was born he had distinct facial features presenting as a long, narrow face. He also presented with large testes. Ryan was born with a dominant genetic disorder. This most likely illustrates _____.
a. sickle cell trait
b. Huntington's disease
c. fragile X syndrome
d. down syndrome
Ans: C
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Application
Answer Location: X-Linked Disorders
Difficulty Level: Hard

24. Scientists focused on X-Linked disorders would be interested in _____.
a. sickle cell trait
b. PKU
c. autistic spectrum disorder
d. hemophilia
Ans: D
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Comprehension
Answer Location: X-Linked Disorders
Difficulty Level: Medium

25. One way hemophilia and Fragile X are differentiated from one another within the X-linked disorders is that _____.
a. Hemophilia is recessive while Fragile X is a dominant disorder
b. Fragile X is recessive while Hemophilia is a dominant disorder
c. Hemophilia does not show up in boys until age 35 or after
d. Fragile X does not allow for a protein to be broken down during digestion
Ans: A
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Analysis
Answer Location: X-Linked Disorders
Difficulty Level: Medium

26. Fragile X syndrome is diagnosed often with _____.

a. sickle cell trait
b. alzheimers
c. autistic spectrum disorder
d. niche-picking
Ans: C
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Knowledge
Answer Location: X-Linked Disorders
Difficulty Level: Easy

27. Hemophilia is a(n) _____.
a. dominant disorder
b. chromosomal disorder
c. X-linked disorder
d. epigenetic disorder
Ans: C
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Knowledge
Answer Location: X-Linked Disorders
Difficulty Level: Easy

28. Trisomy 21 is a chromosomal disorder more commonly known as _____.
a. canalization
b. PKU
c. Huntington's disease
d. Down syndrome
Ans: D
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Knowledge
Answer Location: Chromosomal Abnormalities
Difficulty Level: Easy

29. Researchers focused on down syndrome would most likely also focus on _____ due to the sharing of genetic markers.
a. sickle cell trait
b. alzheimers
c. Fragile X syndrome
d. hemophilia
Ans: B
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Comprehension
Answer Location: Chromosomal Abnormalities

Difficulty Level: Medium

30. Carter was born with very distinct facial features. He presents with a flat nose and almond shaped eyes. The doctor has informed his parents that he has a congenital heart defect along with poor vision. The doctors have educated his parents on his chromosomal abnormality known as _____.
a. Down syndrome
b. hemophilia
c. Huntington's disease
d. sickle cell trait
Ans: A
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Application
Answer Location: Chromosomal Abnormalities
Difficulty Level: Hard

31. Hanna works as an X-ray tech at the local hospital. There was a problem with one of the machines, and everyone was exposed to a low dose of radiation. She has just found out that she is pregnant with her first child. She and her husband have been screened for genetic disorders and have both cleared. Hanna's baby could still be at risk for abnormal genetic structures due to _____.
a. polygenic inheritance
b. mutation
c. niche-picking
d. canalization
Ans: B
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Application
Answer Location: Mutation
Difficulty Level: Hard

32. Scientists focused on chromosomal abnormalities due to changes from the environment would most likely be focused on _____.
a. mutation
b. niche-picking
c. canalization
d. ultrasound
Ans: A
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Comprehension
Answer Location: Mutation
Difficulty Level: Medium

33. Where might mutation may be beneficial to human development?
a. If the mutation is not too serious.
b. If the mutation is polygenic in its inheritance.
c. If the mutation provides an adaptive advantage.
d. If the mutation is involved in canalization.
Ans: C
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Analysis
Answer Location: Mutation
Difficulty Level: Medium

34. Jamal and Kate have been trying to conceive a child. They have experienced three miscarriages, all in the first trimester. They decide that they should visit a genetic counselor to be screened for genetic abnormalities. After the interview, a few medical tests are also conducted. It is revealed that the miscarriages may be influenced by _____.
a. amniocentesis
b. sperm chromosomal abnormalities
c. canalization
d. genomic imprinting
Ans: B
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Application
Answer Location: Genetic Counseling
Difficulty Level: Hard

35. Which refers to the determination of risk of a child inheriting a genetic defect or chromosomal abnormality?
a. Gene–environment interactions
b. Range of reaction
c. Genomic imprinting
d. Genetic counseling
Ans: D
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Knowledge
Answer Location: Genetic Counseling
Difficulty Level: Easy

36. Doctors interested in reproductive technologies would focus on _____.
a. fetoscopy
b. fetal MRI
c. in vitro fertilization
d. canalization

Ans: C
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Comprehension
Answer Location: Reproductive Technology
Difficulty Level: Medium

37. Which is an example of artificial insemination?
a. A woman has the fertilized zygote placed in her uterus.
b. A woman has sperm injected into her.
c. A couple has their fertilized zygote placed into another woman to carry.
d. A couple has decided to adopt a child.
Ans: B
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Comprehension
Answer Location: Reproductive Technology
Difficulty Level: Medium

38. Which inference can be drawn from using in vitro fertilization to conceive?
a. Another party will carry the fetus to term.
b. An ultrasound will identify a genetic abnormality.
c. There is a greater chance of multiple pregnancies.
d. There is a lesser change of multiple pregnancies.
Ans: C
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Analysis
Answer Location: Reproductive Technology
Difficulty Level: Medium

39. Which conclusion could be drawn from a couple using a surrogate?
a. An ultrasound will identify a genetic abnormality.
b. There is a lesser chance of multiple pregnancies.
c. Multiple pregnancies are a guarantee when using a surrogate.
d. Genetic or chromosomal abnormalities may be detected through genetic counseling.
Ans: D
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Analysis
Answer Location: Reproductive Technology
Difficulty Level: Medium

40. The assisted reproductive technology that screens for potential genetic abnormalities is _____.
a. canalization

b. amniocentesis
c. ultrasound
d. in vitro fertilization
Ans: D
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Knowledge
Answer Location: Reproductive Technology
Difficulty Level: Easy

41. The procedure in which fertilization takes place outside of the body, and once fertilized the zygote is placed into the uterus is known as _____.
a. artificial insemination
b. in vitro fertilization
c. ultrasound
d. chorionic villus sampling
Ans: B
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Knowledge
Answer Location: Reproductive Technology
Difficulty Level: Easy

42. _____ allows for a doctor to observe the fetus and measure its growth prenatally.
a. Ultrasound
b. Chorionic villus sampling
c. In vitro fertilization
d. Amniocentesis
Ans: A
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Knowledge
Answer Location: Prenatal Diagnosis
Difficulty Level: Easy

43. The test used to detect genetic and chromosomal anomalies using the fluid from around the fetus is _____.
a. fetoscopy
b. fetal MRI
c. amniocentesis
d. canalization
Ans: C
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Knowledge
Answer Location: Prenatal Diagnosis

Difficulty Level: Easy

44. 37-year-old Priya has just come from her regular prenatal visit. Everything has been going well with her pregnancy. Priya discusses some concerns about her age as well as her partner's family background. Priya's doctor would most likely recommend which test?
a. Amniocentesis
b. Fetal MRI
c. Ultrasound
d. Fetoscopy
Ans: A
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Application
Answer Location: Prenatal Diagnosis
Difficulty Level: Hard

45. Clark and Louise have had difficulties conceiving a child. They have experienced multiple miscarriages. They have also tried in vitro fertilization in order to have a baby. They have gone to genetic counseling and undergone many tests to get to the bottom of their fertility issues. It has been determined that it would be very difficult and expensive for Louise to conceive a child and carry it to term. Which of these may be the best option for them?
a. Artificial insemination
b. Niche-picking
c. Adoption
d. Chorionic villus sampling
Ans: C
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Application
Answer Location: Prenatal Diagnosis
Difficulty Level: Hard

46. A doctor has seen some possible abnormalities on an ultrasound. Which would most likely be recommended next?
a. Amniocentesis
b. Fetoscopy
c. In vitro fertilization
d. Fetal MRI
Ans: D
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Comprehension
Answer Location: Prenatal Diagnosis
Difficulty Level: Medium

47. Carly has just found out that she is pregnant. She and her partner are very excited for this new chapter in their lives. Carly wants to begin designing the nursery, but knows she will need to wait until the doctor can tell her the sex of her child. This would be revealed most likely in which test?
a. Amniocentesis
b. Ultrasound
c. In vitro fertilization
d. Artificial insemination
Ans: B
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Application
Answer Location: Prenatal Diagnosis
Difficulty Level: Hard

48. Doctors focused on finding genetic issues between the 9th and 12th week of pregnancy through extraction of genetic material would most likely use _____.
a. chorionic villus sampling
b. ultrasound
c. fetal MRI
d. canalization
Ans: A
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Comprehension
Answer Location: Prenatal Diagnosis
Difficulty Level: Medium

49. One way tamniocentesis is differentiated from chorionic villus sampling is that an amniocentesis _____.
a. extracts genetic material through the abdomen
b. extracts genetic material vaginally
c. allows the doctor to view a picture of the fetus
d. is a non-invasive procedure
Ans: A
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Analysis
Answer Location: Prenatal Diagnosis
Difficulty Level: Medium

50. _____ is the genetic makeup that is inherited from our biological parents.
a. Genotype
b. Phenotype
c. Gametes

d. Canalization
Ans: A
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Knowledge
Answer Location: Heredity and Environment
Difficulty Level: Easy

51. The traits that we ultimately show and express is the _____.
a. genotype
b. phenotype
c. mitosis
d. meiosis
Ans: B
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Knowledge
Answer Location: Heredity and Environment
Difficulty Level: Easy

52. Identical twins Olivia and Sophia are taking part in a study. Olivia has shown a distinct propensity towards math while Sophia towards language. Since they share 100% of the same DNA, these differences cannot be attributed to _____.
a. environment
b. genetics
c. mitosis
d. meiosis
Ans: B
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Application
Answer Location: Methods of Behavioral Genetics
Difficulty Level: Hard

53. Passive gene-environment correlation differs from evocative gene-environment correlation in that it _____.
a. occurs regardless of the child's behavior
b. occurs because of the child's behavior
c. is biologically preprogrammed traits that cannot change
d. occurs on many different genes in the genotype
Ans: A
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Analysis
Answer Location: Gene-Environment Interaction
Difficulty Level: Medium

54. Researchers interested in understanding why children pick the activities that they do would most likely focus on _____.
a. canalization
b. niche-picking
c. genomic imprinting
d. chorionic villus sampling
Ans: B
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Comprehension
Answer Location: Gene-Environment Interaction
Difficulty Level: Medium

55. The interplay that determines our characteristics, behavior, development, and health is _____.
a. genotype
b. dominant-recessive inheritance
c. gene-environment interaction
d. genomic imprinting
Ans: C
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Knowledge
Answer Location: Gene-Environment Interaction
Difficulty Level: Easy

56. Which inference can be drawn about genotype in the range of reaction of a phenotype?
a. The range of reaction can be altered only by severe deprivation.
b. The genotype is how most of the cells in the human body reproduce to create the range of reaction in the phenotype.
c. The genotype acts as the boundary for the many different expressions of the phenotype due to the environment.
d. The phenotype acts as the boundary or the many different expressions of the genotype due to the environment.
Ans: C
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Analysis
Answer Location: Range of Reaction
Difficulty Level: Medium

57. Developmental scientists interested in biologically programmed traits would focus on those traits that are _____.
a. incomplete

b. correlated
c. dominant
d. canalized
Ans: D
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Comprehension
Answer Location: Canalization
Difficulty Level: Medium

58. 7-month-old Carter has not yet been able to sit up without support. He is in an orphanage where the caregivers only make sure that they are fed and clean. There is little to no interaction. Eventually, Carter will most likely learn to sit up without support as this piece of motor development is _____.
a. niche-picking
b. incomplete
c. recessive
d. canalized
Ans: D
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Application
Answer Location: Canalization
Difficulty Level: Hard

59. 10-year-old Billy wants to join the school orchestra. He wants to learn how to play many of the different string instruments. His grandfather played cello for several years in his youth, demonstrating a particular excellence with music. This illustrates _____.
a. incomplete dominance
b. dominant-recessive inheritance
c. niche-picking
d. genomic imprinting
Ans: C
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Application
Answer Location: Gene-Environment Correlations
Difficulty Level: Hard

60. The tendency to pick out experiences and environments that support our genetic tendencies is _____.
a. niche-picking
b. polygenic inheritance
c. canalization
d. heritability
Ans: A

Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Knowledge
Answer Location: Gene-Environment Correlations
Difficulty Level: Easy

61. Two-year-old Rosa is a happy toddler. She smiles at people and initiates interactions. This organically makes adults drawn to her in positive ways, increasing her environmental interactions. It could be said that Rosa is influencing her own social world to help to support her genotype. This illustrates _____.
a. evocative gene-environment correlation
b. passive gene-environment correlation
c. niche-picking
d. canalization
Ans: A
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Application
Answer Location: Gene-Environment Correlations
Difficulty Level: Hard

62. _____ is the understanding that our genes provide the blueprint for development while the context or situation controls the expression of the phenotypes.
a. Mutation
b. Gametes
c. Imprinting
d. Epigenetics
Ans: D
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Knowledge
Answer Location: Epigenetic Influences on Development
Difficulty Level: Easy

63. 7-month-old Carrie has warm and supportive parents. They make sure that she is actively engaged in her environment. They pay close attention to the nutrition that she gets as well. This environment allows her genes to switch on and off according to _____.
a. niche-picking
b. epigenetics
c. genotype
d. genomic imprinting
Ans: B
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Application

Answer Location: Epigenetic Influences on Development
Difficulty Level: Hard

64. Scientists interested in the blueprint for human development would focus on the _____.
a. range of reaction
b. canalization
c. genotype
d. phenotype
Ans: C
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Comprehension
Answer Location: Epigenetic Influences on Development
Difficulty Level: Medium

65. How would you classify epigenetic changes in human development?
a. These epigenetic changes would be positive in human development.
b. Epigenetics makes reversing the canalization of motor development possible.
c. Epigenetic mechanisms can turn genes off, avoiding negative consequences.
d. Epigenetic mechanisms can turn genes on or off influencing development positively or negatively.
Ans: D
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Analysis
Answer Location: Epigenetic Influences on Development
Difficulty Level: Medium

Short Answer

1. Describe how incomplete dominance works with in a heterozygous person. Give an example of how this would present.
Ans: The dominant allele does not completely dominate the recessive allele. In a heterozygous person, this could present as an AB blood type. Sickle cell trait is another example of incomplete dominance. Student answers may vary.
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Comprehension
Answer Location: Incomplete Dominance
Difficulty Level: Medium

2. Explain how genomic imprinting affects expression of a gene.
Ans: Genomic imprinting refers to the process wherein a gene is expressed differently depending on whether or not it was inherited from the mother or the father.
Learning Objective: 2.1: Discuss the genetic foundations of development.

Cognitive Domain: Comprehension
Answer Location: Genomic Imprinting
Difficulty Level: Medium

3. Are there more recessive or dominant abnormal genes? Why is this is the case?
Ans: There are more recessive abnormal genes than dominant abnormal genes because dominant disorders are not passed down due to the low survivability of a person with a dominant genetic disorder. Huntington's disease is a rare exception to this. Answers may vary.
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Comprehension
Answer Location: Dominant-Recessive Disorders
Difficulty Level: Medium

4. What inference can be made as to why X-linked disorders express themselves more in males than in females?
Ans: A female has XX chromosomes, while a male has XY. Since males have only one X, it cannot be masked the way it would in a female having XX. This leaves males more vulnerable to an X-linked disorder.
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Analysis
Answer Location: X-Linked Disorders
Difficulty Level: Medium

5. Identify the differences between hemophilia and fragile X syndrome within the X linked disorders.
Ans: Student answers should include that hemophilia is a recessive disorder while fragile X is dominant. This means that females carry hemophilia while males will express the disorder. With fragile X, both sexes are prone to expression of the disorder.
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Analysis
Answer Location: X Linked Disorders
Difficulty Level: Medium

6. Who would benefit from genetic counseling? Why?
Ans: Genetic counseling can be beneficial and may be recommended for those who have a relative with a genetic condition, women over the age of 35, couples experiencing fertility problems, and those experiencing recurrent miscarriage problems. Many of these issues can be the result of genetic or chromosomal issues.
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Comprehension
Answer Location: Genetic Counseling

Difficulty Level: Medium

7. Identify the outcomes for children who are adopted.
Ans: Answers may vary. Adopted children may experience greater stress prenatally. Research has shown that academic achievement may be lower among adopted children. Yet, parents tend to spend more time with adopted children and provide more educational resources.
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Analysis
Answer Location: Adoption
Difficulty Level: Medium

8. Identify a drawback of using an amniocentesis as a means to detect a genetic or chromosomal abnormality.
Ans: Answers may vary. An amniocentesis is an invasive test which naturally poses risks. There is an increase chance of miscarriage as well.
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Analysis
Answer Location: Prenatal Diagnosis
Difficulty Level: Medium

9. Imagine you are an adopted child who has no information about your biological parents. From your phenotype, what could you determine about your biological parents?
Ans: Answers will vary. Students should show an understanding of phenotypes. Students should also show an understanding of how genetic and environment influences a person's characteristics.
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Application
Answer Location: Heredity and Environment
Difficulty Level: Hard

10. In determining heritability, behavioral geneticists seek to understand which processes?
Ans: Behavioral geneticists examine the heritability of traits and behaviors through the contributions of the genotype and the role of experience in determining phenotypes.
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Comprehension
Answer Location: Methods of Behavioral Genetics
Difficulty Level: Medium

Essay

1. Can you infer whether or not there are more dominant or recessive abnormal genes and disorders? Explain why this is the case.
Ans: Answers should include that there are more recessive abnormal genes (not disorders) than dominant as those with a dominant abnormal gene usually do not survive long enough to pass it along. Most dominant disorders are severely disabling. Recessive abnormal genes can be expressed or remain as a carrier.
Learning Objective: 2.1: Discuss the genetic foundations of development.
Cognitive Domain: Analysis
Answer Location: Dominant-Recessive Inheritance
Difficulty Level: Medium

2. Why is it important in a course on child development to study genetics? Discuss three specific reasons.
Ans: Answers will vary. Students may include understanding the difference of dominant and recessive disorders for detection. Other reasons that could be discussed would include to treat genetic disorders such as PKU; to advance medical treatments of accompanying issues, such as with Down's syndrome; to increase the lifespan and the quality of life for those effected; and to understand mutation of genetics due to environmental exposure.
Learning Objective: 2.2: Identify examples of genetic disorders and chromosomal abnormalities.
Cognitive Domain: Comprehension
Answer Location: Chromosomal and Genetic Problems
Difficulty Level: Medium

3. What are some of the benefits and possible problems with in vitro fertilization as an answer to infertility issues for couples? Discuss these pros and cons to reproductive technologies.
Ans: Answers may vary. Students should reference some of the following: the benefits for single or lesbian women to conceive a child; couples with fertility issues to conceive; and screening for genetic defects, which takes place with in vitro fertilization. Drawbacks to these procedures are the expense and multiple births, which can lead to poorer outcomes.
Learning Objective: 2.3: Examine the choices available to prospective parents in having healthy children.
Cognitive Domain: Analysis
Answer Location: Reproductive Technology
Difficulty Level: Medium

4. How do twin and adoption studies benefit behavioral geneticists? Discuss in detail.
Ans: Twin studies are able to use monozygotic and dizygotic twins to understand the role of genetics. Adoption studies are able to look closely at environment since the children share no DNA with the parents. Students answers should expand on this understanding.

Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Comprehension
Answer Location: Methods of Behavioral Genetics
Difficulty Level: Medium

5. Identify and examine at least two different gene-environment interactions. Discuss in detail.
Ans: Student answers will vary. They may choose from range of reaction, canalization, gene-environment correlations, or epigenetic frameworks.
Learning Objective: 2.4: Summarize the interaction of heredity and environment, including behavioral genetics and the epigenetic framework.
Cognitive Domain: Analysis
Answer Location: Gene-Environment Interaction
Difficulty Level: Medium