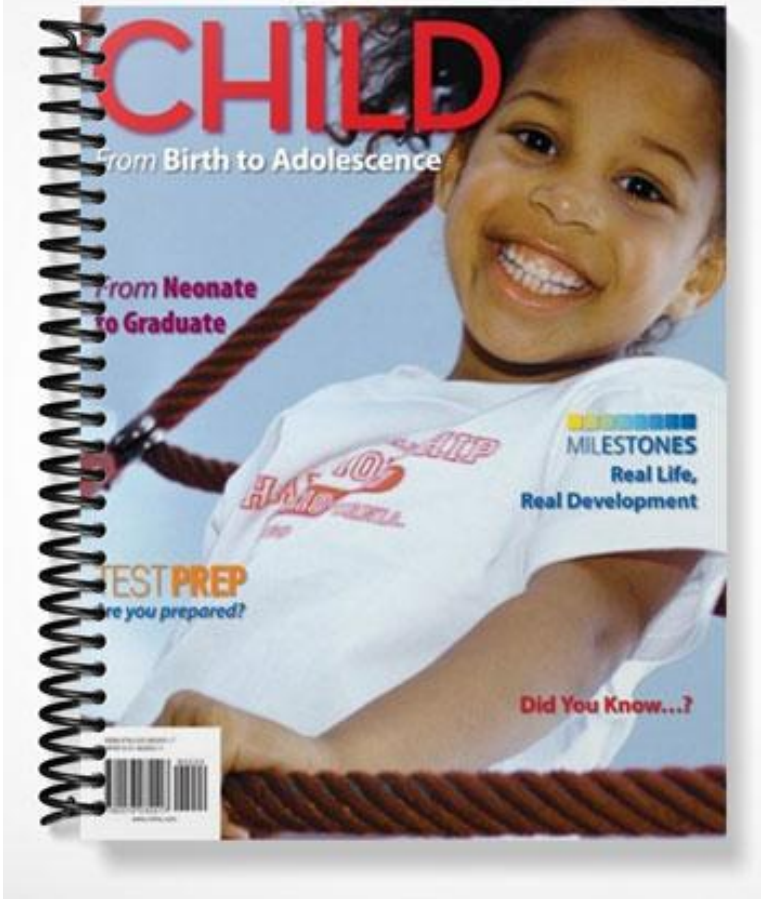
TEST BANK


CHILD
From Birth to Adolescence
From Neonate to Graduate
MILESTONES
Real Life, Real Development
TEST PREP
re you prepared?
Did You Know...?

Chapter 02
Conception, Heredity, and Environment

True / False Questions

1. *(p. 30)* An ovum duplicates itself repeatedly by cell division to produce all the cells that make up a baby.
FALSE

Learning Objective: 02-01 Conception and Infertility

2. *(p. 30)* If fertilization does not occur, the ovum and any sperm cells in the woman's body die.
TRUE

Learning Objective: 02-01 Conception and Infertility

3. *(p. 30)* Women's fertility is less affected by age than men's, but it declines significantly by the late twenties.
FALSE

Learning Objective: 02-01 Conception and Infertility

4. *(p. 30)* Sexually transmitted diseases can lead to infertility indirectly through the development of scar tissue.
TRUE

Learning Objective: 02-01 Conception and Infertility

5. *(p. 31)* In the technique of intracytoplasmic sperm injection, a single sperm is injected into the ovum.
TRUE

Learning Objective: 02-01 Conception and Infertility

6. *(p. 33)* Genes are coils of DNA that consist of smaller segments called chromosomes.
FALSE

Learning Objective: 02-02 Mechanisms of Heredity

7. *(p. 33)* The complete sequence of genes in the human body constitutes the human genome.
TRUE

Learning Objective: 02-02 Mechanisms of Heredity

8. *(p. 34)* It is the mother who determines the sex of the child.
FALSE

Learning Objective: 02-02 Mechanisms of Heredity

9. *(p. 34)* Females' development requires the activation of the SRY gene.
FALSE

Learning Objective: 02-02 Mechanisms of Heredity

10. *(p. 34)* In normal development, male embryos start producing the hormone testosterone at about 6 to 8 weeks after conception.
TRUE

Learning Objective: 02-02 Mechanisms of Heredity

11. *(p. 35)* Different versions of a particular gene are called mutations.
FALSE

Learning Objective: 02-02 Mechanisms of Heredity

12. *(p. 36)* Defects transmitted by recessive inheritance tend to be more lethal at an earlier age, in contrast to those transmitted by dominant inheritance.
TRUE

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

13. *(p. 38)* Incomplete dominance is a pattern of inheritance in which certain characteristics carried on the X chromosome inherited from the mother are transmitted differently to her male and female offspring.
FALSE

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

14. *(p. 38)* Chromosomal abnormalities typically occur because of errors in cell division.
TRUE

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

15. *(p. 39)* Children with Down syndrome are more likely to have a single transverse palmar crease.
TRUE

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

16. *(p. 40)* Heritability refers to the relative influence of heredity and environment in a particular individual.
FALSE

Learning Objective: 02-04 Interactions of Heredity and Environment

17. *(p. 42)* The tendency to seek out environments compatible with one's genotype is called niche-picking.
TRUE

Learning Objective: 02-04 Interactions of Heredity and Environment

18. *(p. 43)* Obesity is measured by body mass index (BMI).
TRUE

Learning Objective: 02-05 Characteristics Influenced by Heredity and Environment

19. *(p. 44)* Autism is characterized by loss of contact with reality; hallucinations and delusions; loss of coherent, logical thought; and inappropriate emotionality.
FALSE

Learning Objective: 02-05 Characteristics Influenced by Heredity and Environment

20. *(p. 44)* Advanced paternal age is a risk factor for schizophrenia.
TRUE

Learning Objective: 02-05 Characteristics Influenced by Heredity and Environment

Multiple Choice Questions

21. *(p. 30)* The union of sperm and ovum to produce a zygote is known as
A. menstruation.
B. ovulation.
C. attachment.
D. fertilization.

Learning Objective: 02-01 Conception and Infertility

22. *(p. 30)* _____ is a one-celled organism resulting from fertilization.
A. Zygote
B. Ovum
C. Blastula
D. Spermatozoon

Learning Objective: 02-01 Conception and Infertility

23. *(p. 30)* Which of the following statements is true about fertilization?
A. Women are born with a large number of immature ova at birth.
B. Fertilization typically occurs before the ovum reaches the fallopian tube.
C. The fertilization process typically involves only one sperm being released into the vagina.
D. Women begin to produce ova only upon attaining sexual maturity.

Learning Objective: 02-01 Conception and Infertility

24. *(p. 30)* In a sexually mature woman, ovulation occurs about once every _____ days until menopause.
A. 7
B. 10
C. 19
D. 28

Learning Objective: 02-01 Conception and Infertility

25. *(p. 30)* Fertilization typically occurs while the ovum is passing through the
A. testes.
B. fallopian tube.
C. follicle.
D. cervix.

Learning Objective: 02-01 Conception and Infertility

26. *(p. 30)* Sperm are produced by the _____ at a rate of several hundred million a day and are ejaculated in the semen at sexual climax.
A. ovary
B. cervix
C. testes
D. uterus

Learning Objective: 02-01 Conception and Infertility

27. *(p. 30)* One of the most common causes of infertility in men is
A. low sperm count.
B. artificial insemination.
C. high sperm motility.
D. malnutrition.

Learning Objective: 02-01 Conception and Infertility

28. *(p. 31)* Dan and Fiona decided to utilize technology to overcome their infertility problems. They chose a procedure in which a mature ovum was surgically removed, fertilized in a laboratory dish, and then implanted in the Fiona's uterus. This technique is called
A. artificial insemination.
B. in vitro fertilization.
C. gamete intrafallopian transfer.
D. surrogacy.

Learning Objective: 02-01 Conception and Infertility

29. *(p. 31)* The simplest form of assisted reproductive technology (ART) is _____ in which sperm is injected into a woman's vagina, cervix, or uterus.
A. ovum transfer
B. gamete intrafallopian transfer
C. artificial insemination
D. in vitro fertilization

Learning Objective: 02-01 Conception and Infertility

30. *(p. 31)* Fred and Wilma have discovered that their infertility is due to Fred's extremely low sperm count. In an attempt to conceive, Wilma's doctor injects a collection of her husband's sperm directly into her cervix. This procedure is called
A. in vitro fertilization.
B. gamete intrafallopian transfer.
C. artificial insemination.
D. ovum transfer.

Learning Objective: 02-01 Conception and Infertility

31. *(p. 33)* Which of the following is true of the genetic code?
A. DNA has a cylindrical structure.
B. Chromosomes are found only in the gamete cells.
C. The human genome represents the complete sequence of genes in the human body.
D. A single gene can be located in numerous potential points on a chromosome.

Learning Objective: 02-02 Mechanisms of Heredity

32. *(p. 33)* The chemical component that plays a major role in heredity is
A. threonine.
B. adenosine monophosphate.
C. arachidonic acid.
D. deoxyribonucleic acid.

Learning Objective: 02-02 Mechanisms of Heredity

33. *(p. 33)* _____ are the functional units of heredity.
A. Zygotes
B. Genes
C. Follicles
D. Gametes

Learning Objective: 02-02 Mechanisms of Heredity

34. *(p. 33)* How many pairs of chromosomes does a normal human being have?
A. 25
B. 23
C. 46
D. 48

Learning Objective: 02-02 Mechanisms of Heredity

35. *(p. 33)* Which of the following is true of meiosis?
A. It results in two cells, each with 46 chromosomes.
B. It reduces the number of chromosomes by half.
C. It refers to the addition of an extra 21st chromosome.
D. It represents the process by which the egg and sperm combine.

Learning Objective: 02-02 Mechanisms of Heredity

36. *(p. 33)* When sperm and ovum fuse at conception, they produce a zygote with _____ chromosomes.
A. 28
B. 50
C. 23
D. 46

Learning Objective: 02-02 Mechanisms of Heredity

37. *(p. 34)* The process of cell division that produces copies of cells with 46 chromosomes each is called
A. diffusion.
B. meiosis.
C. translocation.
D. mitosis.

Learning Objective: 02-02 Mechanisms of Heredity

38. *(p. 34)* Male embryos begin to show signs of sexual differentiation only after the activation of the
A. HOX genes.
B. SRY gene.
C. autosomes.
D. Wnts.

Learning Objective: 02-02 Mechanisms of Heredity

39. *(p. 34)* The normal complement of sex chromosomes for a woman is _____, and for a man it is
A. YO; XO.
B. XY; YX.
C. XX; XO.
D. XX; XY.

Learning Objective: 02-02 Mechanisms of Heredity

40. *(p. 34)* Sex determination of an embryo depends heavily on the
A. 22 pairs of sex chromosomes in humans.
B. pair of sex chromosomes received from the mother.
C. chromosomes present in the father's sperm cell.
D. autosomes received by embryo from both parents.

Learning Objective: 02-02 Mechanisms of Heredity

41. *(p. 34)* _____ are chromosomes that do not impact sexual expression.
A. Allosomes
B. Ribosomes
C. Lysosomes
D. Autosomes

Learning Objective: 02-02 Mechanisms of Heredity

42. *(p. 34)* How many pairs of autosomes do humans normally have?
A. 22
B. 46
C. 44
D. 1

Learning Objective: 02-02 Mechanisms of Heredity

43. *(p. 34)* During the 1860s, Gregor Mendel conducted experiments that laid the foundation for understanding
A. patterns of inheritance.
B. intelligence.
C. the development of autosomes.
D. prenatal development.

Learning Objective: 02-02 Mechanisms of Heredity

44. *(p. 34)* Mendel's most important finding was that
A. genes occur singly, never in pairs.
B. genes do not have fixed positions on chromosomes.
C. individual traits blend into one another.
D. hereditary traits are transmitted independently of each other.

Learning Objective: 02-02 Mechanisms of Heredity

45. *(p. 34)* Genes that produce alternative expressions of a trait are called
A. gametes.
B. alleles.
C. autosomes.
D. karyotypes.

Learning Objective: 02-02 Mechanisms of Heredity

46. *(p. 34)* Matu received identical alleles for dimples from each of his parents. We would say that Matu is _____ for that trait.
A. homozygous
B. multizygous
C. heterozygous
D. monozygous

Learning Objective: 02-02 Mechanisms of Heredity

47. *(p. 34)* Tongue rolling is a dominant trait. This implies that tongue rolling
A. is determined by numerous genes.
B. is manifested only when both alleles received from the parents are recessive.
C. is transmitted through one dominant and one recessive allele inherited from parents.
D. is manifested in the phenotypes of both parents as well as the offspring universally.

Learning Objective: 02-02 Mechanisms of Heredity

48. *(p. 34)* 48**.** Jake has six fingers on his left hand. In which of the following cases would his offspring not have polydactyly?
A. If the alleles inherited by the offspring from Jake and his partner are heterozygous
B. If the alleles inherited by the offspring include one dominant allele and one recessive allele.
C. If both the alleles inherited by the offspring are dominant alleles
D. It both the alleles inherited by the offspring are recessive alleles

Learning Objective: 02-02 Mechanisms of Heredity

49. *(p. 35)* Permanent genetic alterations that may produce harmful characteristics are called
A. genetic imprints.
B. mutations.
C. transductions.
D. genome splits.

Learning Objective: 02-02 Mechanisms of Heredity

50. *(p. 35)* A spontaneous mutation called _____ results in dwarfism.
A. toxoplasmosis
B. achondroplasia.
C. bordetella
D. achlorhydria

Learning Objective: 02-02 Mechanisms of Heredity

51. *(p. 35)* Polygenic inheritance is
A. a pattern of inheritance in which multiple genes at different sites on chromosomes affect a complex trait.
B. a pattern of inheritance in which a child receives identical recessive alleles, resulting in expression of a nondominant trait.
C. a pattern of inheritance in which a child receives two different alleles, resulting in partial expression of a trait.
D. a pattern of inheritance in which, when a child receives different alleles only the dominant one is expressed.

Learning Objective: 02-02 Mechanisms of Heredity

52. *(p. 35)* An individual's _____ consists of his/her observable traits; an individual's _____ is his/her underlying genetic pattern.
A. dominant inheritance; recessive inheritance
B. dominant inheritance; homozygosis
C. incomplete dominance; phenotype
D. phenotype; genotype

Learning Objective: 02-02 Mechanisms of Heredity

53. *(p. 35)* Petra would like to replicate herself. However, she needs to realize that although cloning can produce identical _____, it cannot produce identical _____.
A. phenotypes; autosomes
B. phenotypes; genotypes
C. genotypes; phenotypes
D. autosomes; sex chromosomes

Learning Objective: 02-02 Mechanisms of Heredity

54. *(p. 35)* Louise's blue eyes and petite frame are the observable characteristics that comprise her
A. alleles.
B. genetic imprint.
C. phenotype.
D. genotype.

Learning Objective: 02-02 Mechanisms of Heredity

55. *(p. 35)* Brooklyn has curly hair but carries an allele for straight hair. The allele for straight hair is a component of her _____ in this scenario.
A. genotypic pattern
B. physical features
C. observable characteristics
D. phenotypic expression

Learning Objective: 02-02 Mechanisms of Heredity

56. *(p. 35)* When the police asks you to give a description of an assailant and you say that she is tall with black, curly hair, you are describing the assailant's
A. alleles.
B. genetic pattern.
C. phenotype.
D. genotype.

Learning Objective: 02-02 Mechanisms of Heredity

57. *(p. 35)* _____ is a mechanism that turns genes on or off and determines functions of body cells.
A. Mitosis
B. Meiosis
C. Phagocytosis
D. Epigenesis

Learning Objective: 02-02 Mechanisms of Heredity

58. *(p. 35)* Which of the following is not true about epigenesis?
A. It is a mechanism that turns genes on or off.
B. It works via chemical molecules attached to a gene that "read" the gene's DNA.
C. Epigenetic changes may also contribute to such common ailments as cancer, diabetes, and heart disease.
D. Epigenetic changes focus solely on the role of the genetic material one inherits.

Learning Objective: 02-02 Mechanisms of Heredity

59. *(p. 36)* Krystal was ill as a baby, and before she was a year old she was diagnosed with _____, a genetic defect that causes thick mucus to clog the breathing passages and the digestive system.
A. cystic fibrosis
B. Down syndrome
C. neural tube defect
D. Huntington's disease

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

60. *(p. 36)* Which birth defect afflicts African-Americans more than it does other ethnic groups?
A. Tay-Sachs disease
B. Sickle-cell anemia
C. Cystic fibrosis
D. Thalassemia

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

61. *(p. 36)* Recessive defects are expressed only if the child is _____ for that gene.
A. homozygous
B. unizygous
C. monozygous
D. heterozygous

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

62. *(p. 36)* Incomplete dominance is a pattern of inheritance in which
A. multiple genes at different sites on chromosomes affect a complex trait.
B. a child receives identical recessive alleles, resulting in expression of a nondominant trait.
C. a child receives two different alleles, resulting in partial expression of a trait.
D. a child receives different alleles, but only the dominant one is expressed.

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

63. *(p. 36)* Baby Shanna has been diagnosed with Tay-Sachs disease. However, neither of her parents has shown symptoms of this disease. What can we conclude from this information?
A. Shanna is heterozygous for the Tay-Sachs gene.
B. Tay-Sachs disease is a function of a mutated gene.
C. The Tay-Sachs carrier gene is a recessive gene.
D. One of Shanna's parents is a carrier of Tay-Sachs, the other is not.

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

64. *(p. 38)* A pattern of inheritance in which certain characteristics carried on the X chromosome inherited from the mother are manifested differently in her male and female offsprings is called
A. recessive inheritance.
B. dominant inheritance.
C. multifactorial inheritance.
D. sex-linked inheritance.

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

65. *(p. 38)* Gerald suffers from hemophilia, which is a blood-clotting disorder. He understands that the gene responsible for this disorder is carried by females, but usually affects only males. This is an example of
A. multifactorial inheritance.
B. dominant inheritance.
C. sex-linked inheritance.
D. independent segregation.

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

66. *(p. 38)* Klinefelter syndrome and Turner syndrome are caused by abnormalities of the
A. autosomes.
B. sex chromosomes.
C. teratogens.
D. cilia.

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

67. *(p. 39)* A chromosomal disorder characterized by moderate-to-severe mental retardation and a downward-sloping skin fold at the inner corners of the eyes is called
A. cystic fibrosis.
B. Tay-Sachs disease.
C. Down syndrome.
D. sickle-cell anemia.

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

68. *(p. 39)* Which of the following statements regarding Down syndrome is true?
A. The cognitive functioning of children with Down syndrome is normal.
B. Children with Down syndrome can be helped with dietary changes.
C. Down syndrome is a sex-linked chromosomal disorder.
D. The risk of having a child with Down syndrome rises with the age of the mother.

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

69. *(p. 39)* Clinical service that advises prospective parents of their probable risk of having children with hereditary defects is known as
A. genetic imprinting.
B. teratogenesis.
C. genetic coding.
D. genetic counseling.

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

70. *(p. 40)* A statistical estimate of how much heredity influences individual differences in a specific trait at a certain time within a given population is referred to as
A. gene mapping.
B. heritability.
C. Karyotyping.
D. genetic coding.

Learning Objective: 02-04 Interactions of Heredity and Environment

71. *(p. 41)* Which of the following terms describes the tendency of twins to share the same trait or disorder?
A. Disposition
B. Temperament
C. Concordance
D. Canalization

Learning Objective: 02-04 Interactions of Heredity and Environment

72. *(p. 41)* In an attempt to study the degree to which genetics influences activity levels in newborns, a researcher compares monozygotic and dizygotic twins for their level of similarity on that trait. This research is attempting to determine the _____ of the trait activity levels.
A. teratogenesis
B. genotype
C. karyotype
D. heritability

Learning Objective: 02-04 Interactions of Heredity and Environment

73. *(p. 41)* Doug has been asked by his professor to participate in a family study. Who else will most likely be included in the study?
A. Doug's brother or sister
B. Doug's co-worker
C. Doug's closest friends
D. Doug's sister in-law

Learning Objective: 02-04 Interactions of Heredity and Environment

74. *(p. 41)* Although Roberto's adoptive parents are short in stature, he is growing to be tall like his biological mother. What might we conclude about Roberto's height?
A. It is influenced primarily by environment.
B. It is influenced primarily by heredity.
C. Nutrition did not influence his height.
D. It is primarily a result of independent segregation.

Learning Objective: 02-04 Interactions of Heredity and Environment

75. *(p. 41)* Which of the following most clearly demonstrates the influence of environment?
A. Georgio, who was adopted at birth, resembles his biological father and brother closely.
B. Sally, who was adopted at the age of 2 years, has quickly developed a good vocabulary because her adoptive mother actively engages her in conversations.
C. Bill and Jim, identical twins who were separated at birth, have many similarities like obesity, blood pressure, and left-handedness.
D. Ann and Jennie are fraternal twins who were reared apart and only Ann has high blood pressure.

Learning Objective: 02-04 Interactions of Heredity and Environment

76. *(p. 41)* Susan and Betty are monozygotic twins, whereas Ming and Li are dizygotic twins. If a particular trait is determined primarily by hereditary factors, what would be the relative degree of concordance in these two twin pairs?
A. Ming and Li are more concordant than are Susan and Betty.
B. Susan and Betty are more concordant than are Ming and Li.
C. Given similar environments, the two sets of twins are equally concordant.
D. It is not possible to determine concordance by studying twins.

Learning Objective: 02-04 Interactions of Heredity and Environment

77. *(p. 41)* Depending on environmental conditions, the potential variability in the expression of a hereditary trait is called
A. canalization.
B. concordance rate.
C. reaction range.
D. environmental interaction.

Learning Objective: 02-04 Interactions of Heredity and Environment

78. *(p. 41)* _____ refers to limitation on variance of expression of certain inherited characteristics.
A. Canalization
B. Multifactorial transmission
C. Transduction
D. Mutation

Learning Objective: 02-04 Interactions of Heredity and Environment

79. *(p. 41)* _____ refers to all the potential expressions of a hereditary trait.
A. Canalization
B. Reaction range
C. Transduction
D. Karyotype

Learning Objective: 02-04 Interactions of Heredity and Environment

80. *(p. 42)* A strongly canalized trait is one that
A. is easily influenced by environmental conditions.
B. is affected only by extreme change in environmental conditions.
C. is manifested mostly in males.
D. is characterized by a large reaction range.

Learning Objective: 02-04 Interactions of Heredity and Environment

81. *(p. 42)* Most children learn to walk at about the same time and in the same sequence. We would say that walking, as a trait, is
A. unaffected by reaction range.
B. purely phenotypical.
C. monozygotic.
D. canalized.

Learning Objective: 02-04 Interactions of Heredity and Environment

82. *(p. 42)* _____ usually refers to the effects of similar environmental conditions on genetically different individuals.
A. Teratogenesis
B. Genotype-environment interaction
C. Epigenesis
D. Phenotype-environment interaction

Learning Objective: 02-04 Interactions of Heredity and Environment

83. *(p. 42)* Children select experiences that are consistent with their genetic tendencies. This is due to which of the following types of genotype-environment correlations?
A. Active correlation
B. Passive correlation
C. Evocative correlation
D. Reactive correlation

Learning Objective: 02-04 Interactions of Heredity and Environment

84. *(p. 42)* The environment often reflects or reinforces genetic differences. In other words, certain genetic and environmental influences tend to reinforce each other. This tendency is called
A. environment-phenotype covariance.
B. genotype-environment correlation.
C. nonshared environmental effect.
D. shared environmental effect.

Learning Objective: 02-04 Interactions of Heredity and Environment

85. *(p. 42)* In university, Chandra tried a number of different majors until she found one that was right for her. She was originally interested in a career in research and was very successful academically. She realized that she missed social interaction, so she decided to try teaching high school biology. The first time she stood in front of the classroom, she knew that this was where she belonged. Which of the following terms best explains Chandra's development?
A. Passive genotype-environment correlation
B. Normative genotype-environment correlation
C. Reactive genotype-environment correlation
D. Active genotype-environment correlation

Learning Objective: 02-04 Interactions of Heredity and Environment

86. *(p. 42)* Which of the following types of genotype-environment correlations is only experienced by children raised with their biological parents?
A. Active correlations
B. Passive correlations
C. Evocative correlations
D. Reactive correlations

Learning Objective: 02-04 Interactions of Heredity and Environment

87. *(p. 42)* The idea that each child in a family grows up in a unique environment is referred to as
A. nonshared environmental effect.
B. familial environmental effect.
C. niche-picking effect.
D. parent-child effect.

Learning Objective: 02-04 Interactions of Heredity and Environment

88. *(p. 42-43)* Although brothers Jono and Roman bear a striking physical resemblance to each other, they differ greatly in intellect and personality. One reason for this difference may be
A. the normative events they both experienced.
B. the familial environment effects they both experienced.
C. the nonshared environmental effects they both experienced.
D. the effects of canalization they both experienced.

Learning Objective: 02-04 Interactions of Heredity and Environment

89. *(p. 43)* Which of the following statements regarding obesity is true?
A. Studies indicate that 40-70% of the risk of obesity is genetic.
B. Studies are yet to ascertain if there are specific genes that code for chances of obesity.
C. Obesity is on the rise in Western countries solely due to a genetic vulnerability to obesity.
D. The risk of obesity is free of any environmental risk factors.

Learning Objective: 02-05 Characteristics Influenced by Heredity and Environment

90. *(p. 43)* Intelligence is a trait that is
A. influenced by the effects of large numbers of genes working together.
B. determined by a relatively small number of recessive genes.
C. determined from the karyotype of the father.
D. characterized by a lack of plasticity toward extreme environmental features.

Learning Objective: 02-05 Characteristics Influenced by Heredity and Environment

91. *(p. 44)* Sophia was adopted when she was one year of age. If she takes an IQ test at age 16, her intelligence level is likely to be most similar to that of her
A. adoptive parents.
B. friends and peers.
C. biological parents.
D. adoptive siblings.

Learning Objective: 02-05 Characteristics Influenced by Heredity and Environment

92. *(p. 44)* Which of the following is true of temperament?
A. It is closely related to the age of a person's parents when that person was conceived.
B. It lacks a genetic basis.
C. It appears to be largely inborn.
D. It is inconsistent over the years.

Learning Objective: 02-05 Characteristics Influenced by Heredity and Environment

93. *(p. 44)* A psychological disorder that is marked by a loss of contact with reality, includes such symptoms as hallucinations and delusions, and seems to have a strong genetic component is
A. dyslexia.
B. depression.
C. schizophrenia.
D. Down syndrome.

Learning Objective: 02-05 Characteristics Influenced by Heredity and Environment

94. *(p. 44)* Many studies suggest that schizophrenia
A. is characterized by a strong hereditary influence.
B. is seldom seen in family clusters.
C. is solely a result of environmental stress.
D. is caused by a single gene.

Learning Objective: 02-05 Characteristics Influenced by Heredity and Environment

95. *(p. 44)* Concordance rates for schizophrenia are highest
A. for infants born in early summer.
B. between grandparents and grandchildren.
C. between monozygotic twin pairs.
D. between dizygotic twin pairs.

Learning Objective: 02-05 Characteristics Influenced by Heredity and Environment

Essay Questions

96. *(p. 30)* Describe how and when human conception normally occurs.

Fertilization, or conception, is the process by which sperm and ovum—the male and female gametes, or sex cells—combine to create a single cell called a zygote, which then duplicates itself repeatedly by cell division to produce all the cells that make up a baby. In a sexually mature woman, ovulation occurs about once every 28 days until menopause. After being expelled from the ovary, the ovum is swept along through one of the fallopian tubes by tiny hair cells, called cilia, toward the uterus, or womb. Sperm are produced in the testicles (testes), or reproductive glands, of a mature male at a rate of several hundred million a day and are ejaculated in the semen at sexual climax. Deposited in the vagina, they try to swim through the cervix (the opening of the uterus) and into the fallopian tubes, but only a tiny fraction make it that far. The nature of the sperm and the ovum that finally fuse together has dramatic implications for the offspring.
Fertilization typically occurs while the ovum is passing through the fallopian tube. If fertilization does not occur, the ovum and any sperm cells in the woman's body die. The sperm are absorbed by the woman's white blood cells, and the ovum passes through the uterus and exits through the vagina.

Learning Objective: 02-01 Conception and Infertility

97. *(p. 33)* The study of inherited factors that affect development is referred to as heredity. Define the function of each of the following terms, and explain their relationship to the mechanisms of heredity: DNA, chromosomes, and genes.

An integral component of heredity is a chemical called deoxyribonucleic acid (DNA). The double-helix structure of DNA resembles a long, spiraling ladder whose steps are made of pairs of chemical units called bases. Chromosomes are coils of DNA that consist of smaller segments called genes and are found in every cell in the human body. Each gene has a specific location on its chromosome and contains thousands of bases. The sequence of bases in a gene tells the cell how to make the proteins that enable it to carry out its specific functions. The complete sequence of genes in the human body constitutes the human genome.

Learning Objective: 02-02 Mechanisms of Heredity

98. *(p. 38-39)* What is Down syndrome? Explain how often it occurs. What challenges does a person with Down syndrome face?

The most common genetic disorder in children is Down syndrome. It is a chromosomal disorder characterized by moderate-to-severe mental retardation and by such physical signs as a downward-sloping skin fold at the inner corners of the eyes. It is responsible for about 40 percent of cases of moderate-to-severe mental retardation as defined by performance on an intelligence test. The condition is also called trisomy-21 because it is characterized in more than 90 percent of cases by an extra 21st chromosome. Some of the commonly seen physical characteristics in individuals with Down syndrome are a downward-sloping skin fold at the inner corners of the eyes, receding chin, and protruding tongue. Children with Down syndrome also tend to have slowed growth; poor muscle tone; congenital heart defects; thick hands; ear infections and early hearing loss; and impaired communication, language, memory, and motor skills.

Learning Objective: 02-03 Genetic and Chromosomal Abnormalities

99. *(p. 41)* Describe how researchers use family studies, adoption studies, and twin studies to investigate the heritability of traits.

Heritability is the statistical estimate of contribution of heredity to individual differences in a specific trait within a given population at a particular time. Concordance rates are measures of heritability that describe the tendency of twins to share the same trait or disorder.
In family studies, researchers measure the degree to which biological relatives share certain traits and determine whether or not the closeness of the familial relationship is associated with the degree of similarity. In other words, the more closely two people are related, the more likely they will be similar on a trait if that trait is indeed genetically influenced. Therefore, researchers use concordance rates on traits to infer genetic influences.
Adoption studies look at similarities between adopted children and their adoptive families and also between adopted children and their biological families. When adopted children are more like their biological parents and siblings in a particular trait (say, obesity), we see the influence of heredity. When they resemble their adoptive families more, we see the influence of environment.
Twin studies compare pairs of monozygotic twins with same-sex dizygotic twins. Monozygotic twins are twice as genetically similar, on average, as dizygotic twins. When monozygotic twins are more alike, or more concordant, on a trait than dizygotic twins, we see the likely effects of heredity. As an extension of this, twins raised in either their biological family or an adoptive family can be studied.

Learning Objective: 02-04 Interactions of Heredity and Environment

100. *(p. 43-44)* Describe the role of heredity and environment in obesity, schizophrenia, and intelligence.

The risk of obesity is 2 to 3 times higher for a child with a family history of obesity. However, this increased risk is not solely genetic. The kind and amount of food eaten in a particular home or in a particular social or ethnic group and the amount of exercise that is encouraged can increase or decrease the likelihood that a child will become overweight. The rise in the prevalence of obesity in Western countries seems to stem from the interaction of a genetic predisposition with overeating, supersized portions, and inadequate exercise.
Heredity exerts a strong influence on general intelligence, as measured by intelligence tests, and a moderate effect on specific abilities such as memory, verbal ability, and spatial ability. While specific genes might contribute to intelligence, intelligence is influenced by the effects of large numbers of genes working together. Indirect evidence of the role of heredity in intelligence comes from adoption and twin studies. Adopted children's scores on standardized intelligence tests are consistently closer to the scores of their biological mothers than to those of their adoptive parents and siblings.
Schizophrenia is a neurological disorder that affects about 1 percent of the U.S. population each year. It is characterized by loss of contact with reality; hallucinations and delusions; loss of coherent, logical thought; and inappropriate emotionality. Estimates of heritability for this disorder are as high as 80 to 85 percent. However, monozygotic twins are not always concordant for schizophrenia, perhaps due to epigenesis. Researchers also have looked at possible nongenetic influences, such as minor brain damage in fetal life, exposure to influenza or the mother's loss of a close relative in the first trimester of pregnancy, or maternal rubella or respiratory infections in the second and third trimesters. Infants born in urban areas or in late winter or early spring appear to be at increased risk, as are those whose mothers experienced obstetric complications or who were poor or severely deprived as a result of war or famine. Advanced paternal age is also a risk factor for schizophrenia.

Learning Objective: 02-05 Characteristics Influenced by Heredity and Environment