

1) Each sperm and egg contain 46 chromosomes.

a. True

b. False

Correct: *Each sperm and egg contain 23 chromosomes.*

Incorrect: *Each sperm and egg contain 23 chromosomes.*

Answer: b

Page Reference: 49-50

Topic: Mechanisms of Heredity

Skill: Factual

2) *In vitro fertilization* involves combining the sperm and egg in a laboratory dish.

a. True

b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 50

Topic: Mechanisms of Heredity

Skill: Factual

3) About 80 percent of *in vitro fertilization* attempts succeed.

a. True

b. False

Correct: *About one third of in vitro fertilization attempts succeed.*

Incorrect: *About one third of in vitro fertilization attempts succeed.*

Answer: b

Page Reference: 50

Topic: Mechanisms of Heredity

Skill: Factual

4) The autosomes determine the sex of the child.

a. True

b. False

Correct: *The sex chromosomes determine the sex of the child.*

Incorrect: *The sex chromosomes determine the sex of the child.*

Answer: b

Page Reference: 51

Topic: Mechanisms of Heredity

Skill: Factual

5) Chromosomes consist of deoxyribonucleic acid (DNA).

a. True

b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 51

Topic: Mechanisms of Heredity

Skill: Factual

6) Genes are made up of nucleotide bases.

a. True

b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 51

Topic: Mechanisms of Heredity

Skill: Factual

7) A homozygous individual has two alleles that are the same.

a. True

b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 53

Topic: Mechanisms of Heredity

Skill: Factual

8) Individuals with the sickle-cell allele are more resistant to malaria.

a. True

b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 54

Topic: Mechanisms of Heredity

Skill: Conceptual

9) If an allele for a disorder is dominant, then every person who receives the allele will have the disorder.

a. True

b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 55

Topic: Mechanisms of Heredity

Skill: Conceptual

10) Genetic counsellors construct detailed family histories to determine the likelihood that someone is carrying an allele for a particular disorder.

a. True

b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 57

Topic: Mechanisms of Heredity

Skill: Factual

11) The presence of abnormal autosomes is a major cause for spontaneous abortions during the period of the zygote.

a. True

b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 58

Topic: Mechanisms of Heredity

Skill: Conceptual

12) The extra 21st chromosome that is found with Down syndrome usually comes from the father's sperm.

- a. True
- b. False

Correct: *The extra 21st chromosome is usually provided by the mother's egg.*

Incorrect: *The extra 21st chromosome is usually provided by the mother's egg.*

Answer: b

Page Reference: 57

Topic: Mechanisms of Heredity

Skill: Conceptual

13) The risk of having a baby with Down syndrome decreases as the mother gets older.

- a. True
- b. False

Correct: *The risk increases as the mother gets older.*

Incorrect: *The risk increases as the mother gets older.*

Answer: b

Page Reference: 57-58

Topic: Mechanisms of Heredity

Skill: Conceptual

14) The presence of a Y chromosome appears to be necessary for life.

- a. True
- b. False

Correct: *The X chromosome appears to be necessary for life.*

Incorrect: *The X chromosome appears to be necessary for life.*

Answer: b

Page Reference: 58

Topic: Mechanisms of Heredity

Skill: Factual

15) Most behavioural and psychological traits are polygenic traits.

- a. True
- b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 59

Topic: Heredity, Environment, and Development

Skill: Conceptual

16) In twin studies, it is assumed that heredity influences a characteristic if fraternal twins are more alike than identical twins.

a. True

b. False

Correct: *This would be true if identical twins were more alike than fraternal twins.*

Incorrect: *This would be true if identical twins were more alike than fraternal twins.*

Answer: b

Page Reference: 61

Topic: Heredity, Environment, and Development

Skill: Applied

17) In adoption studies, if a behaviour has genetic roots, adopted children should behave more like their biological parents than their adoptive parents.

a. True

b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 61

Topic: Heredity, Environment, and Development

Skill: Applied

18) One problem with twin studies is that the experiences of identical twins may be more similar than the experiences of fraternal twins so that heredity appears to have a greater influence.

a. True

b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 62

Topic: Heredity, Environment, and Development

Skill: Conceptual

19) If one identical twin is clinically depressed, the other twin has a 25 percent chance of becoming depressed.

a. True

b. False

Correct: *The other twin has a 50 percent chance of becoming depressed in this case.*

Incorrect: *The other twin has a 50 percent chance of becoming depressed in this case.*

Answer: b

Page Reference: 63

Topic: Heredity, Environment, and Development

Skill: Conceptual

20) About 50 percent of the differences in children's scores on intelligence tests are due to heredity.

a. True

b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 66

Topic: Heredity, Environment, and Development

Skill: Conceptual

21) The traits controlled by single genes usually represent either-or phenotypes, while traits controlled by many genes typically represent an entire range of different outcomes.

a. True

b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 59

Topic: Heredity, Environment, and Development

Skill: Conceptual

22) The behavioural consequences of genetic instructions depend on the environment in which those interactions develop.

- a. True
- b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 67

Topic: Heredity, Environment, and Development

Skill: Conceptual

23) The same genotype for intelligence leads to the same phenotypes for intelligence. This is called reaction range.

- a. True
- b. False

Correct: *Reaction range means that different environments can yield different phenotypes for the same genotype.*

Incorrect: *Reaction range means that different environments can yield different phenotypes for the same genotype.*

Answer: b

Page Reference: 66

Topic: Heredity, Environment, and Development

Skill: Applied

24) Heredity and environment interact dynamically throughout development.

- a. True
- b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 65-66

Topic: Heredity, Environment, and Development

Skill: Conceptual

25) The environment has no impact on when genes are activated—they follow a predictable and predetermined schedule based on maturation.

- a. True
- b. False

Correct: *Genes and environment constantly influence each other, and the environment can determine when genes are “turned on.”*

Incorrect: *Genes and environment constantly influence each other, and the environment can determine when genes are “turned on.”*

Answer: b

Page Reference: 65-66

Topic: Heredity, Environment, and Development

Skill: Conceptual

26) Experiences determine which phenotypes emerge, and genotypes influence the nature of experiences.

a. True

b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 67-68

Topic: Heredity, Environment, and Development

Skill: Conceptual

27) Although environmental factors are important, they usually affect each child in a unique way, which makes siblings differ.

a. True

b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 68

Topic: Heredity, Environment, and Development

Skill: Conceptual

28) Heredity-environmental influences at any given point are affected by prior heredity-environmental exchanges.

a. True

b. False

Correct: *Statement of fact*

Incorrect: *Statement of fact*

Answer: a

Page Reference: 68

Topic: Heredity, Environment, and Development

Skill: Conceptual

1) Explain basic concepts of single gene inheritance using the terms *alleles*, *chromosomes*, *homozygous*, *heterozygous*, *dominant*, *recessive*.

Answer:

A good answer will include the following key points:

- Genes come in different forms called alleles.
- The alleles in a pair of chromosomes are sometimes the same, which makes them homozygous.
- The alleles in a pair of chromosomes sometimes differ, which makes them heterozygous.
- If a person is homozygous for a trait, such as eye colour, the genotype produces the phenotype.
- If a person is heterozygous for a trait, the phenotype produced depends on which allele is dominant.
- If one allele is dominant, its chemical instructions are followed whereas those of the other, the recessive allele, are ignored.

Page Reference: 53

Topic: Mechanisms of Heredity

Skill: Conceptual

2) Name and briefly describe some common disorders associated with recessive alleles.

Answer:

A good answer will include the following key points:

- Albinism: Skin lacks melanin, which causes visual problems and extreme sensitivity to light.
- Cystic fibrosis: Excess mucous clogs digestive and respiratory tracts.
- Phenylketonuria (PKU): Phenylalanine, an amino acid, accumulates in the body and damages the nervous system, causing mental retardation.
- Tay-Sachs disease: The nervous system degenerates in infancy, causing deafness, blindness, mental retardation, and, during the preschool years, death.

Page Reference: 55

Topic: Mechanisms of Heredity

Skill: Conceptual

3) Explain the general properties of the paths from genes to behaviour.

Answer:

A good answer will include the following key points:

- The behavioural consequences of genetic instructions depend on the environment in which those instructions develop.

Reaction range: The same genotype can produce a range of phenotypes, in reaction to the environment where development takes place.

·Heredity and environment interact dynamically throughout development.

·Genes can influence the kind of environment to which a child is exposed.

Niche-picking: The process of deliberately seeking environments that fit one's heredity.

·Environmental influences typically make children within a family different.

Nonshared environmental influences: The environmental forces that make siblings different from one another.

Page Reference: 65-68

Topic: Heredity, Environment, and Development

Skill: Conceptual

4) Your friends Shania and Ricky are expecting a baby. Both Shania and Ricky are farsighted and have cheek dimples. Shania and Ricky have said that they hope that their baby won't need to wear glasses or have cheek dimples because they both hate their glasses and dimples. What can you tell them about genetic inheritance and the likelihood that they will get their wish?

Answer:

A good answer will be similar to the following:

You can tell Shania and Ricky that both farsightedness and cheek dimples are dominant traits. That means that an individual who is heterozygous with one dominant allele and one recessive allele will still show the dominant trait. Given that both Shania and Ricky show the dominant traits, they both must have at least one allele for the dominant trait so the likelihood that their baby will NOT have the dominant traits of farsightedness and cheek dimples is small.

Page Reference: 53-55

Topic: Mechanisms of Heredity

Skill: Applied

5) Describe phenylketonuria. What is it, its causes, its symptoms, and treatment?

Answer:

A good answer will be similar to the following:

Phenylketonuria (PKU) is a disorder in which babies are born lacking an important enzyme. It is caused by two recessive alleles found on chromosome 12. The missing enzyme is one that breaks down phenylalanine, an amino acid. Without the enzyme, phenylalanine accumulates, damaging the nervous system and leading to delayed mental development. PKU can be controlled by diet by avoiding products that contain phenylalanine. With a special diet, mental retardation can be avoided.

Page Reference: 66

Topic: Mechanisms of Heredity

Skill: Factual

6) Name and describe (a) a disorder caused by an abnormal number of autosomal chromosomes, and (b) a disorder caused by an abnormal number of sex chromosomes.

Answer:

A good answer will include the following key points:

(a) Down syndrome is caused by an extra 21st chromosome.

°Symptoms:

- almond-shaped eyes
- a fold over the eyelid
- smaller than normal head, neck, and nose
- delayed mental and behavioural development
- mental retardation

(b) Klinefelter's syndrome (XXY chromosome pattern): Characteristics includes tall stature, small testicles, sterile, below-normal intelligence, passive. Males only. OR

·XYY complement: Characteristics include tall stature and, sometimes, below-normal intelligence. Males only. OR

·Turner's syndrome (Xo): Characteristics are short stature, limited development of secondary sex characteristics, problems perceiving spatial relations. Females only. OR

·XXX syndrome: Characteristics are normal stature but delayed motor and language development. Females only.

Page Reference: 56-58

Topic: Mechanisms of Heredity

Skill: Factual

7) Explain how (a) twin studies and (b) adoption studies are used to determine the influence of heredity on a trait and discuss a potential flaw of each type of study.

Answer:

A good answer will be similar to the following:

(a) *Twin studies* compare identical and fraternal twins to determine the influence of heredity. Identical or monozygotic twins come from a single fertilized egg that splits in two, and they have the same genes. Fraternal or dizygotic twins come from two separate eggs fertilized by two separate sperm and share, on average, about half their genes just like regular siblings. In a twin study, if identical twins are more alike than fraternal twins on a particular trait or behaviour, it suggests that heredity influences that trait or behaviour. *Potential flaw*: Parents and other people may treat identical twins more similarly than they treat fraternal twins. This would make identical twins more similar

than fraternal twins in their experiences as well as in their genes.

(b) In *adoption studies*, adopted children are compared to their adoptive parents and their biological parents. Adoptive parents have provided the child's environment. Biological parents provided the child's genes. If children are more similar to their biological parents than to their adoptive parents on a particular trait or behaviour, it suggests that genes influence that trait or behaviour. *Potential flaw*: Adoption agencies may try to place children in homes like those of their biological parents. This can bias adoption studies because biological and adoptive parents end up being similar.

Page Reference: 60-62

Topic: Heredity, Environment, and Development

Skill: Conceptual

8) Explain what is meant by a reaction range and give an example of how a reaction range might work.

Answer:

A good answer will include the following key points:

Reaction range: The same genotype can produce a range of phenotypes, in reaction to the environment where development takes place.

For example, individuals with the genotype for phenylketonuria (PKU) lack an enzyme that breaks down the amino acid, phenylalanine, which is found in many foods that children regularly eat. If phenylalanine is ingested, it will accumulate in the child's body, damage the nervous system and lead to delayed mental development. If, though, the child is placed on a diet that limits phenyl- alanine, the disease does not emerge and the nervous system develops normally.

Page Reference: 66

Topic: Heredity, Environment, and Development

Skill: Conceptual

9) You and a friend were talking about the role of heredity and environment and your friend said, "Heredity is destiny. When someone inherits genes for bad diseases there is nothing about the environment that can change the negative effects." What can you tell your friend about the interaction of heredity and environment in cases such as those involving individuals with phenylketonuria?

Answer:

A good answer will be similar to the following:

You can tell your friend that heredity is not destiny. One can inherit a particular genotype but that genotype can interact with a particular environment to change the phenotype. In the case of phenylketonuria (PKU), an individual may inherit the gene for PKU.

Typically, the individual lacks an enzyme that breaks down phenylalanine. Phenylalanine is found in many foods such as meats and dairy products. When the phenylalanine is not broken down it builds up and produces toxins that damage the nervous system, which leads to mental retardation. However, if the environment is changed so that the amount of phenylalanine in a child's diet is reduced, then the damage to the nervous system does not occur and normal intelligence occurs. In other words, the same genotype for PKU can interact with two different environments (either a regular diet or a low-phenylalanine diet) to lead to two very different outcomes (either normal intelligence or mental retardation). So, even in the case of a negative, inherited disorder the environment can still play an important role in shaping the environment.

Page Reference: 66

Topic: Heredity, Environment, and Development

Skill: Conceptual

10) The other day I heard someone say "There is no such thing as twins who are brother/sisters (mix-sex twins)." What would you have said if you had been there?

Answer:

You could have told him/her that he/she was thinking about monozygotic twins. These twins are the result of one fertilized egg that has divided. Therefore monozygotic (or identical) twins have the exact same genes—so they must also be the same sex. However, dizygotic twins come from two separate eggs fertilized by two separate sperm. These twins have the same genetic overlap as full brothers and sisters, but just as you can have a boy and a girl in the same family, you can also have mix-sex dizygotic (fraternal) twins.

Page Reference: 61

11) Why are African Canadians more likely to inherit sickle-cell disease?

Answer:

African Canadians are more likely to inherit sickle-cell disease because the sickle cell has a benefit: Individuals with this allele are more resistant to malaria. Therefore, in parts of the world (such as Africa) where malaria is found you are also more likely to find individuals carrying this trait. Having two alleles for sickle-cell disease has devastating consequences to the carrier. However, having only one sickle cell allele results in a person who is more resistant to malaria and yet suffers from the disorder only when put under extreme conditions (in instances of low oxygen). Therefore, having sickle-cell trait is quite adaptive in Africa. However, it has no adaptive value in Canada and accordingly we are seeing fewer and fewer individuals with sickle-cell trait in successive generations of African Canadians.

Page Reference: 53-54

Skill: Conceptual

- 1) Jackie has sickle-cell anemia, a condition which is
- a. caused by a virus.
 - b. caused by a bacterial infection.
 - c. inherited.
 - d. related to a lack of protein in the diet.

Correct: *Sickle-cell anemia is a genetic trait which is inherited.*

Incorrect: *Sickle-cell anemia is a genetic trait which is inherited.*

Answer: c

Page Reference: 53

Topic: Mechanisms of Heredity

Skill: Applied

- 2) Who is most likely to have sickle-cell anemia?
- a. Tad, a European Canadian
 - b. Jared, an African Canadian
 - c. Miguel, a Native Canadian
 - d. Ed, an Asian Canadian

Correct: *Sickle-cell anemia primarily affects African Canadians.*

Incorrect: *Sickle-cell anemia primarily affects African Canadiansl.*

Answer: b

Page Reference: 54

Topic: Mechanisms of Heredity

Skill: Applied

- 3) Each sperm and egg contains _____ chromosomes.
- a. 23
 - b. 26
 - c. 46
 - d. a variable number of

Correct: *Each sperm and egg have half (23) the number of chromosomes so that when they combine, they make a total of 46.*

Incorrect: *Each sperm and egg have half (23) the number of chromosomes so that when they combine, they make a total of 46.*

Answer: a

Page Reference: 50

Topic: Mechanisms of Heredity

Skill: Factual

- 4) Tiny structures in the nucleus of a cell that contain genetic material are called
- chromosomes.
 - phenotypes.
 - heterozygous.
 - homozygous.

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: a

Page Reference: 50

Topic: Mechanisms of Heredity

Skill: Factual

- 5) A fertilized egg contains _____ chromosome(s).
- 1
 - 22
 - 23
 - 46

Correct: *Once the egg is fertilized, it contains the total (46) complement of chromosomes, that is 23 from the egg and 23 from the sperm.*

Incorrect: *Once the egg is fertilized, it contains the total (46) complement of chromosomes, that is 23 from the egg and 23 from the sperm.*

Answer: d

Page Reference: 50

Topic: Mechanisms of Heredity

Skill: Factual

- 6) In vitro fertilization is a procedure in which
- an egg is fertilized by sperm in a laboratory dish and then placed in the mother's uterus.
 - sperm is injected into the mother's uterus to fertilize her egg.

c. a fertilized egg is extracted from one woman's uterus and then placed in another woman's uterus.

d. a surrogate mother is used to carry another couple's developing fetus.

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: a

Page Reference: 50

Topic: Mechanisms of Heredity

Skill: Conceptual

7) In vitro fertilization

a. usually is accompanied by surrogate motherhood.

b. is successful about 80 percent of the time.

c. is less likely to result in the birth of twins or triplets.

d. sometimes involves the use of egg and sperm from donors.

Correct: *A-C are all false, leaving only D as the correct answer.*

Incorrect: *A-C are all false, leaving only D as the correct answer.*

Answer: d

Page Reference: 50

Topic: Mechanisms of Heredity

Skill: Factual

8) Lilly and Kyle have been unable to conceive a baby through sexual intercourse, so they have decided to try in vitro fertilization. Which of the following is true about their situation?

a. Lilly and Kyle's attempts to have a baby through in vitro fertilization are very likely to be successful.

b. Lilly and Kyle are very likely to have to use a surrogate mother to carry the child.

c. Lilly and Kyle will have to use donor sperm.

d. If Lilly does become pregnant, she will have a higher than average chance of having twins or triplets.

Correct: *Though A-C are all possibilities, they are not very likely or guaranteed, while D is a statement of fact.*

Incorrect: *Though A-C are all possibilities, they are not very likely or guaranteed, while D is a statement of fact.*

Answer: d

Page Reference: 50

Topic: Mechanisms of Heredity

Skill: Applied

9) The first _____ pairs of chromosomes are called autosomes.

a. 22

b. 23

c. 44

d. 46

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: a

Page Reference: 51

Topic: Mechanisms of Heredity

Skill: Factual

10) The first 22 pairs of chromosomes

a. contain either X or Y chromosomes.

b. determine the sex of the individual.

c. are called autosomes.

d. do not vary in size.

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: c

Page Reference: 51

Topic: Mechanisms of Heredity

Skill: Factual

11) Autosomal chromosomes

a. come in pairs containing one large and one small chromosome.

b. come in pairs of chromosomes that are about the same size.

c. determine the sex of a child.

d. have an X and a Y chromosome.

Correct: *C and D refer to sex chromosomes, A is false.*

Incorrect: *C and D refer to sex chromosomes, A is false.*

Answer: b

Page Reference: 51

Topic: Mechanisms of Heredity

Skill: Conceptual

12) Sex chromosomes

- a. do not come in pairs.
- b. come in pairs of chromosomes that are about the same size.
- c. determine the sex of the child.
- d. are the first 22 pairs of chromosomes.

Correct: *A and D are false, B is only true for women, leaving C as the answer.*

Incorrect: *A and D are false, B is only true for women, leaving C as the answer.*

Answer: c

Page Reference: 51

Topic: Mechanisms of Heredity

Skill: Conceptual

13) Kelly and Ruben just had a baby boy. If they could look at their baby's sex chromosomes, they would see

- a. one X and one Y chromosome.
- b. two Y chromosomes.
- c. one Y chromosome only.
- d. two X chromosomes.

Correct: *A male has an XY chromosome combination.*

Incorrect: *A male has an XY chromosome combination.*

Answer: a

Page Reference: 51

Topic: Mechanisms of Heredity

Skill: Applied

14) Chromosomes consist of

- a. eggs and sperm.
- b. phenotypes.

- c. gametes.
- d. deoxyribonucleic acid.

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: d

Page Reference: 51

Topic: Mechanisms of Heredity

Skill: Conceptual

15) Each group of nucleotide bases that provides a specific set of biochemical instructions is called a

- a. phenotype.
- b. gene.
- c. chromosome pair.
- d. recessive allele.

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: b

Page Reference: 51

Topic: Mechanisms of Heredity

Skill: Factual

16) Blueprints are to a completed house as _____ are to _____.

- a. phenotypes; genotypes
- b. genotypes; phenotypes
- c. recessive genes; dominant genes
- d. dominant genes; recessive genes

Correct: *The genotype is the plan (blueprints) while the phenotype represents the outward manifestation (house) of the plan.*

Incorrect: *The genotype is the plan (blueprints) while the phenotype represents the outward manifestation (house) of the plan.*

Answer: b

Page Reference: 52

Topic: Mechanisms of Heredity

Skill: Conceptual

17) An individual's physical, behavioural, and psychological features are known as one's

- a. phenotype.
- b. deoxyribonucleic acid.
- c. genotype.
- d. genes.

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: a

Page Reference: 52

Topic: Mechanisms of Heredity

Skill: Conceptual

18) Which of the following is the best example of a phenotype?

- a. blue eyes
- b. an allele for sickle-shaped cells
- c. an XX chromosome pattern
- d. codominant genes

Correct: *The phenotype refers to the outward expression, therefore blue eyes is the only possible answer.*

Incorrect: *The phenotype refers to the outward expression, therefore blue eyes is the only possible answer.*

Answer: a

Page Reference: 52

Topic: Mechanisms of Heredity

Skill: Applied

19) The complete set of genes that makes up a person's heredity is called

- a. an allele.
- b. deoxyribonucleic acid.
- c. a genotype.
- d. a phenotype.

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: c

Page Reference: 51-52

Topic: Mechanisms of Heredity

Skill: Factual

20) Alleles

- a. in a chromosome pair are always the same.
- b. in a chromosome pair are always different.
- c. in a chromosome pair are sometimes the same and sometimes different.
- d. occur singly, not in pairs.

Correct: *Alleles can be homozygous (same) or heterozygous (different).*

Incorrect: *Alleles can be homozygous (same) or heterozygous (different).*

Answer: c

Page Reference: 53

Topic: Mechanisms of Heredity

Skill: Factual

21) When alleles in a chromosome pair are the same, they are said to be

- a. recessive.
- b. dominant.
- c. heterozygous.
- d. homozygous.

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: d

Page Reference: 53

Topic: Mechanisms of Heredity

Skill: Conceptual

22) Leslie is homozygous for hair type. Therefore, she must have

- a. curly hair.
- b. straight hair.
- c. one allele for curly hair and one allele for straight hair.
- d. either two alleles for curly hair or two alleles for straight hair.

Correct: *C is heterozygous, A or B could both be right but could also be wrong, so D has to be the correct choice since it combines A and B and clarifies two of the same allele.*
Incorrect: *C is heterozygous, A or B could both be right but could also be wrong, so D has to be the correct choice since it combines A and B and clarifies two of the same allele.*

Answer: d

Page Reference: 53

Topic: Mechanisms of Heredity

Skill: Applied

23) An individual who is heterozygous for hair colour would have

- a. two alleles for dark eyes.
- b. one allele for dark hair and one for blond hair.
- c. two alleles for blond eyes.
- d. blond hair.

Correct: *A and C are homozygous, as is D (since blond hair recessive and one would need two alleles for blond hair in order to have it), therefore B is the only heterozygous possibility.*

Incorrect: *A and C are homozygous, as is D (since blond hair is recessive and one would need two alleles for blond hair in order to have it), therefore B is the only heterozygous possibility.*

Answer: b

Page Reference: 53

Topic: Mechanisms of Heredity

Skill: Applied

24) Lucas has one allele for normal blood cells and one allele for sickle-shaped cells. Lucas' blood cell alleles are

- a. recessive.
- b. dominant.
- c. heterozygous.
- d. homozygous.

Correct: *Because they are different, they are heterozygous.*

Incorrect: *Because they are different, they are heterozygous.*

Answer: c

Page Reference: 53

Topic: Mechanisms of Heredity

Skill: Applied

25) The chemical instructions of a _____ allele in an allele pair will be followed while those of a _____ allele will be ignored.

- a. heterozygous; homozygous
- b. homozygous; heterozygous
- c. recessive; dominant
- d. dominant; recessive

Correct: *Dominant alleles are always followed while recessive alleles (in a dominant-recessive pairing) are usually ignored (except in the case of incomplete dominance).*

Incorrect: *Dominant alleles are always followed while recessive alleles (in a dominant-recessive pairing) are usually ignored (except in the case of incomplete dominance).*

Answer: d

Page Reference: 53

Topic: Mechanisms of Heredity

Skill: Factual

26) If the allele for brown eyes is dominant and the allele for blue eyes is recessive, which genotype produces a person with blue eyes?

- a. A blue-eyed person is homozygous with two alleles for brown eyes.
- b. A blue-eyed person is homozygous with two alleles for blue eyes.
- c. A blue-eyed person is heterozygous with one allele for blue eyes and one allele for brown eyes.
- d. The alleles for eye colour are demonstrating codominance.

Correct: *B is the only plausible answer since A and C would produce brown eyes, and D violates the assumptions of the question.*

Incorrect: *B is the only plausible answer since A and C would produce brown eyes, and D violates the assumptions of the question.*

Answer: b

Page Reference: 53

Topic: Mechanisms of Heredity

Skill: Applied

27) Abner has a dominant allele for a full head of hair and a recessive allele for male pattern baldness. You would expect Abner to

- a. be completely bald.
- b. be partially bald.
- c. have a full head of hair.
- d. have thin hair.

Correct: *He would have a full head of hair because he would need two recessive alleles to be bald, and male pattern baldness is not an incomplete dominance trait.*

Incorrect: *He would have a full head of hair because he would need two recessive alleles to be bald, and male pattern baldness is not an incomplete dominance trait.*

Answer: c

Page Reference: 53

Topic: Mechanisms of Heredity

Skill: Applied

28) Jolie has sickle-cell trait, a temporary, relatively mild form of sickle-cell anemia, but does not have full-blown sickle-cell anemia. Her condition is most likely the result of

- a. incomplete dominance between one allele for normal blood cells and one for sickle-shaped cells.
- b. two recessive alleles for sickle-shaped cells.
- c. a dominant sickle-shaped cell allele and a recessive normal blood cell allele.
- d. two dominant alleles for normal blood cells.

Correct: *If B was true, she would have sickle-cell anemia; if D was true, she would have normal blood, and C is false because normal blood cells are dominant, not recessive.*

Incorrect: *If B was true, she would have sickle-cell anemia; if D was true, she would have normal blood, and C is false because normal blood cells are dominant, not recessive.*

Answer: a

Page Reference: 53

Topic: Mechanisms of Heredity

Skill: Applied

29) When one allele does not dominate another completely, it is a case of

- a. recessive inheritance.
- b. incomplete dominance.
- c. phenotype.
- d. polygenic inheritance.

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: b

Page Reference: 53

Topic: Mechanisms of Heredity

Skill: Factual

30) Sickle-cell anemia

- a. occurs in individuals who have one allele for normal blood cells and one allele for sickle-shaped cells.
- b. is not an inherited disorder.
- c. is not a serious health problem because it is easily cured.
- d. is becoming less common in successive generations of African Canadians.

Correct: *A refers to sickle-cell trait, B and C are false.*

Incorrect: *A refers to sickle-cell trait, B and C are false.*

Answer: d

Page Reference: 54

Topic: Mechanisms of Heredity

Skill: Factual

31) Individuals with an allele for sickle-cell anemia are

- a. more resistant to malaria.
- b. likely to be of Asian Canadian heritage.
- c. becoming more common in recent years in Canada.
- d. infertile, thus unable to pass the gene on to offspring.

Correct: *B-D are false; A is the only true statement.*

Incorrect: *B-D are false; A is the only true statement.*

Answer: a

Page Reference: 54

Topic: Mechanisms of Heredity

Skill: Factual

32) _____ is an inherited disorder caused by an extra 21st chromosome that results in intellectual disability.

- a. Phenylketonuria
- b. Huntington's disease

- c. Down syndrome
- d. Turner's syndrome

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: c

Page Reference: 56

Topic: Mechanisms of Heredity

Skill: Factual

33) Individuals with Down syndrome show which of the following characteristics?

- a. intellectual disability
- b. aggression
- c. an extra X chromosome
- d. a lack of sexual development

Correct: *All individuals with Down syndrome show some degree of intellectual disability.*

Incorrect: *All individuals with Down syndrome show some degree of intellectual disability.*

Answer: a

Page Reference: 56

Topic: Mechanisms of Heredity

Skill: Factual

34) Recessive alleles are responsible for

- a. Down syndrome.
- b. Huntington's disease.
- c. Klinefelter's syndrome.
- d. phenylketonuria.

Correct: *A is caused by an extra 21st chromosome; B is caused by a dominant allele, and C is caused by an extra sex chromosome, therefore D is the correct answer.*

Incorrect: *A is caused by an extra 21st chromosome; B is caused by a dominant allele, and C is caused by an extra sex chromosome, therefore D is the correct answer.*

Answer: d

Page Reference: 55

Topic: Mechanisms of Heredity

Skill: Factual

35) Perry was born with phenylketonuria (PKU) which means that

- a. she is mentally retarded and has an extra 21st chromosome.
- b. phenylalanine can accumulate and poison her nervous system.
- c. she will develop normally until middle adulthood, at which time her nervous system will begin to deteriorate.
- d. she has a missing chromosome and will be severely retarded.

Correct: *A describes Down syndrome; C describes Huntington's disease, and D could refer to any number of disorders.*

Incorrect: *A describes Down syndrome; C describes Huntington's disease, and D could refer to any number of disorders.*

Answer: b

Page Reference: 66

Topic: Mechanisms of Heredity

Skill: Applied

36) The disorder in which a person's nervous system degenerates during infancy is called

- a. Tay-Sachs disease.
- b. albinism.
- c. cystic fibrosis.
- d. Huntington's disease.

Correct: *Definition given in text*

Incorrect: *Definition given in text*

Answer: a

Page Reference: 55

Topic: Mechanisms of Heredity

Skill: Factual

37) Inherited disorders

- a. are more often caused by recessive alleles than by dominant alleles.
- b. are more often caused by dominant alleles than by recessive alleles.
- c. are due to dominant alleles about half the time.
- d. do not usually seriously impair a child's development.

Correct: *Dominant alleles are not usually responsible for genetic disorders since people with the disorders usually die before they can reproduce, therefore recessive alleles are most frequently the cause.*

Incorrect: *Dominant alleles are not usually responsible for genetic disorders since people with the disorders usually die before they can reproduce, therefore recessive alleles are most frequently the cause.*

Answer: a

Page Reference: 55-56

Topic: Mechanisms of Heredity

Skill: Factual

38) Why are relatively few inherited disorders caused by dominant alleles?

a. Most disorders caused by dominant alleles lead to sterility, which means the dominant allele will not be passed on.

b. Genetic testing can more readily identify dominant rather than recessive alleles; genetic counselling has more successfully reduced the incidence of disorders caused by dominant alleles.

c. Every person with one of the dominant alleles will have the disorder, and people with most of these disorders do not usually live long enough to reproduce, so the allele will not be passed on.

d. Individuals carrying dominant alleles for a disorder are less likely to actually have the disorder than are individuals carrying a recessive allele for a disorder.

Correct: *Dominant alleles are not usually responsible for genetic disorders since people with the disorders usually die before they can reproduce, therefore recessive alleles are most frequently the cause.*

Incorrect: *Dominant alleles are not usually responsible for genetic disorders since people with the disorders usually die before they can reproduce, therefore recessive alleles are most frequently the cause.*

Answer: c

Page Reference: 55-56

Topic: Mechanisms of Heredity

Skill: Conceptual

39) _____ is one of the few serious inherited disorders caused by a dominant allele.

a. Sickle-cell anemia

b. Phenylketonuria

c. Turner's syndrome

d. Huntington's disease

Correct: *A and B are caused by recessive alleles, C is caused by a missing sex chromosome.*

Incorrect: *A and B are caused by recessive alleles, C is caused by a missing sex chromosome.*

Answer: d

Page Reference: 56

Topic: Mechanisms of Heredity

Skill: Factual

40) Huntington's disease is associated with

- a. the absence of an important liver enzyme.
- b. limited development of secondary sexual characteristics.
- c. a progressive deterioration of the nervous system.
- d. taller than normal height.

Correct: *A, B, and D have nothing to do with the disease, while C is a characteristic of it.*

Incorrect: *A, B, and D have nothing to do with the disease, while C is a characteristic of it.*

Answer: c

Page Reference: 56

Topic: Mechanisms of Heredity

Skill: Factual

41) Tom has Huntington's disease. You would expect him to begin to show signs of nervous system deterioration

- a. at birth.
- b. during childhood.
- c. during adolescence.
- d. during middle adulthood.

Correct: *The course of Huntington's disease normally manifests itself in middle adulthood.*

Incorrect: *The course of Huntington's disease normally manifests itself in middle adulthood.*

Answer: d

Page Reference: 56

Topic: Mechanisms of Heredity

Skill: Applied

42) Wendy's development was normal through childhood and early adulthood. However, during her 40s she began to experience muscle spasms, depression, and personality changes. Which of the following disorders or diseases is most likely to be causing her symptoms?

- a. phenylketonuria
- b. Huntington's disease
- c. Turner's syndrome
- d. XXX syndrome

Correct: *A, C, and D would have manifested themselves at birth or soon after.*

Incorrect: *A, C, and D would have manifested themselves at birth or soon after.*

Answer: b

Page Reference: 56

Topic: Mechanisms of Heredity

Skill: Applied

43) Huntington's disease

- a. is caused by two recessive alleles.
- b. can lead to depression and changes in personality.
- c. is apparent in young babies.
- d. usually is not fatal.

Correct: *A, C, and D are false, leaving B as the only possibility.*

Incorrect: *A, C, and D are false, leaving B as the only possibility.*

Answer: b

Page Reference: 56

Topic: Mechanisms of Heredity

Skill: Factual

44) Huntington's disease involves progressive deterioration of the nervous system, which causes

- a. muscle spasms, depression, and personality changes.
- b. schizophrenia.
- c. an accumulation of poisonous substances in the body.
- d. sterility.

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: a

Page Reference: 56

Topic: Mechanisms of Heredity

Skill: Factual

45) Inherited disorders

- a. are most often caused by dominant alleles.
- b. are relatively rare.
- c. do not run in families.
- d. are more common than disorders caused by the wrong number of chromosomes.

Correct: *A, C, and D are all false statements, leaving B as the only possibility*

Incorrect: *A, C, and D are all false statements, leaving B as the only possibility*

Answer: b

Page Reference: 56

Topic: Mechanisms of Heredity

Skill: Factual

46) The most appropriate time for a couple with concerns about their genetic background to seek genetic counselling is

- a. before the woman gets pregnant.
- b. when the woman gets pregnant.
- c. when the couple already has a child with a genetic disorder.
- d. when they are about to become grandparents.

Correct: *A is the only answer that makes sense from the standpoint of being able to do anything.*

Incorrect: *A is the only answer that makes sense from the standpoint of being able to do anything.*

Answer: a

Page Reference: 57

Topic: Mechanisms of Heredity

Skill: Factual

47) Debbie and Paul are thinking about starting a family, but are a little hesitant because there is a history of phenylketonuria in Debbie's family. What should Debbie and Paul do?

- a. They should adopt a child if they want children. Anyone with a history of inherited disease in their family should not have children.
- b. They should go ahead and try to start a family. If Debbie is a carrier of the disease, she is unlikely to be able to get pregnant.
- c. They should go ahead and start trying. Phenylketonuria is not an inherited disease.
- d. They should go to genetic counselling to determine what the odds are that they will pass on the disease.

Correct: *B and C are false; A is an extreme response, leaving D as the only reasonable choice.*

Incorrect: *B and C are false; A is an extreme response, leaving D as the only reasonable choice.*

Answer: d

Page Reference: 57

Topic: Mechanisms of Heredity

Skill: Applied

48) *Cornelius and Janelle sought genetic counselling because of concern that they might have children with sickle-cell anemia. The counsellor determined they each have one recessive allele for sickle-cells and one dominant allele for healthy blood cells. The counsellor would tell them that they have a

- a. 100 percent chance of having a child with sickle-cell anemia.
- b. 25 percent chance of having a child with sickle-cell anemia and a 50 percent chance of having a child with sickle-cell trait.
- c. 25 percent chance of having a child with sickle-cell trait and a 50 percent chance of having a child with sickle-cell anemia.
- d. 75 percent chance of having a child with sickle-cell anemia.

Correct: *The four possible combinations are a normal child (two dominant alleles), a child with sickle cell anemia (two recessive alleles) and two children with sickle-cell trait (one dominant and one recessive).*

Incorrect: *The four possible combinations are a normal child (two dominant alleles), a child with sickle cell anemia (two recessive alleles) and two children with sickle-cell trait (one dominant and one recessive).*

Answer: b

Page Reference: 53

Topic: Mechanisms of Heredity

Skill: Applied

49) Genetic counselling typically involves

- a. obtaining a detailed family history and performing tests to help couples with concerns about inherited disorders.
- b. informing parents-to-be about how they can have a more intelligent child.
- c. the government in making decisions for private citizens.
- d. helping couples with fertility problems.

Correct: *B and C are false, D could be true but is not the primary purpose of genetic counselling.*

Incorrect: *B and C are false, D could be true but is not the primary purpose of genetic counselling.*

Answer: a

Page Reference: 57

Topic: Mechanisms of Heredity

Skill: Conceptual

50) Extra, missing, or damaged chromosomes

- a. do not usually disturb development.
- b. sometimes disturb development.
- c. always disturb development.
- d. always cause spontaneous abortion.

Correct: *While the extent of the disturbance varies, it always happens.*

Incorrect: *While the extent of the disturbance varies, it always happens.*

Answer: c

Page Reference: 56

Topic: Mechanisms of Heredity

Skill: Factual

51) Aletha and Frank are worried about their one-year-old baby. His eyes are almond-shaped (unlike theirs), his head seems small, and his development is slower than average—he's just now starting to sit up by himself. Which of the following disorders would you suspect their baby has?

- a. Huntington's disease
- b. Klinefelter's syndrome
- c. Turner's syndrome

d. Down syndrome

Correct: *Those are all symptoms of Down syndrome.*

Incorrect: *Those are all symptoms of Down syndrome.*

Answer: d

Page Reference: 56-57

Topic: Mechanisms of Heredity

Skill: Applied

52) Children with Down syndrome typically have

a. advanced development.

b. normal development.

c. slower than normal development.

d. no development.

Correct: *Down syndrome is always linked with some degree of intellectual disability.*

Incorrect: *Down syndrome is always linked with some degree of intellectual disability.*

Answer: c

Page Reference: 57

Topic: Mechanisms of Heredity

Skill: Conceptual

53) The extra 21st chromosome that causes Down syndrome is

a. usually provided by the egg.

b. usually provided by the sperm.

c. provided by the egg about half the time and by the sperm about half the time.

d. usually created sometime during prenatal development.

Correct: *Research indicates that it usually comes from the mother's egg.*

Incorrect: *Research indicates that it usually comes from the mother's egg.*

Answer: a

Page Reference: 57

Topic: Mechanisms of Heredity

Skill: Factual

54) The incidence of Down syndrome

a. increases as the mother gets older.

- b. decreases as the mother gets older.
- c. decreases as the father gets older.
- d. is unrelated to parental age.

Correct: *Women 35 and older have a greater chance of having a child with Down syndrome, and the risk increases with age.*

Incorrect: *Women 35 and older have a greater chance of having a child with Down syndrome, and the risk increases with age.*

Answer: a

Page Reference: 57-58

Topic: Mechanisms of Heredity

Skill: Factual

55) Who has the greatest risk of having a child with Down syndrome?

- a. 15-year-old Meredith
- b. 22-year-old Katie
- c. 36-year-old Lisa
- d. 44-year-old Susan

Correct: *While Lisa is at risk, Susan is at a greater risk because she is older.*

Incorrect: *While Lisa is at risk, Susan is at a greater risk because she is older.*

Answer: d

Page Reference: 58

Topic: Mechanisms of Heredity

Skill: Applied

56) The most common reason for fertilized eggs to spontaneously abort shortly after conception is

- a. abnormal autosomal chromosomes.
- b. abnormal sex chromosomes.
- c. environmental teratogens.
- d. maternal disease.

Correct: *While all of these can cause a miscarriage, the most common reason is A.*

Incorrect: *While all of these can cause a miscarriage, the most common reason is A.*

Answer: a

Page Reference: 58

Topic: Mechanisms of Heredity

Skill: Factual

57) Harold has Klinefelter's syndrome which is caused by a(n) _____ chromosome pattern.

- a. XYY
- b. XXY
- c. Y
- d. YY

Correct: *Klinefelter's syndrome is characterized by males having an extra X chromosome (XXY).*

Incorrect: *Klinefelter's syndrome is characterized by males having an extra X chromosome (XXY).*

Answer: b

Page Reference: 58

Topic: Mechanisms of Heredity

Skill: Applied

58) Peter has Klinefelter's syndrome. He is likely to be

- a. tall, passive, and have below-normal intelligence.
- b. short and have difficulty with spatial relations.
- c. of normal height and have delayed language development.
- d. tall and of average or above average intelligence.

Correct: *A describes the most common symptoms of Klinefelter's syndrome.*

Incorrect: *A describes the most common symptoms of Klinefelter's syndrome.*

Answer: a

Page Reference: 58

Topic: Mechanisms of Heredity

Skill: Applied

59) Victor is tall and has below-normal intelligence. He has symptoms of

- a. Turner's syndrome.
- b. XXX syndrome.
- c. XYY complement.
- d. Y syndrome.

Correct: *A and D are syndromes associated with women while D is not possible.*

Incorrect: *A and D are syndromes associated with women while D is not possible.*

Answer: c

Page Reference: 58

Topic: Mechanisms of Heredity

Skill: Applied

60) An XYY complement of sex chromosomes is associated with which of the following characteristics?

- a. problems perceiving spatial relations
- b. short stature
- c. below-normal intelligence
- d. susceptibility to heart defects

Correct: *A and B describe Turner's syndrome while D is linked more with Down syndrome.*

Incorrect: *A and B describe Turner's syndrome while D is linked more with Down syndrome.*

Answer: c

Page Reference: 58

Topic: Mechanisms of Heredity

Skill: Conceptual

61) Liz has Turner's syndrome. Which of the following characteristics would you expect her to have?

- a. tall stature
- b. short stature
- c. delayed language development
- d. delayed motor development

Correct: *Turner's syndrome is characterized by short stature.*

Incorrect: *Turner's syndrome is characterized by short stature.*

Answer: b

Page Reference: 58

Topic: Mechanisms of Heredity

Skill: Applied

62) A female who is short, has limited development of secondary sex characteristics, and who has problems with spatial relations would have which of the following disorders?

- a. Klinefelter's syndrome
- b. XYY complement
- c. Turner's syndrome
- d. XXX syndrome

Correct: *A and B are syndromes associated with males, while D is associated with normal height and delayed motor and language development.*

Incorrect: *A and B are syndromes associated with males, while D is associated with normal height and delayed motor and language development.*

Answer: c

Page Reference: 58

Topic: Mechanisms of Heredity

Skill: Conceptual

63) Tina has XXX syndrome. Which of the following characteristics is she likely to have?

- a. tall stature, difficulty with spatial relations
- b. short stature, difficulty with spatial relations
- c. tall stature, below-normal intelligence
- d. normal height, delayed motor and language development

Correct: *XXX syndrome is not associated with any of the symptoms described in A-C.*

Incorrect: *XXX syndrome is not associated with any of the symptoms described in A-C.*

Answer: d

Page Reference: 58

Topic: Mechanisms of Heredity

Skill: Applied

64) A female who has normal stature but delayed language and motor development could have which of the following disorders?

- a. Klinefelter's syndrome
- b. XYY complement
- c. Turner's syndrome
- d. XXX syndrome

Correct: *A and B are disorders associated with males, while C is characterized by short stature and difficulty with spatial relations.*

Incorrect: *A and B are disorders associated with males, while C is characterized by short stature and difficulty with spatial relations.*

Answer: d

Page Reference: 58

Topic: Mechanisms of Heredity

Skill: Conceptual

65) Which of the following chromosomal disorders does not involve abnormal sex chromosomes?

a. Turner's syndrome

b. XXX syndrome

c. Down syndrome

d. Klinefelter's syndrome

Correct: *Down syndrome is an autosomal disorder.*

Incorrect: *Down syndrome is an autosomal disorder.*

Answer: c

Page Reference: 58

Topic: Mechanisms of Heredity

Skill: Conceptual

66) There are no chromosomal disorders consisting solely of _____ chromosomes.

a. X

b. Y

c. autosomal

d. sex

Correct: *The X chromosome seems to be necessary for life, so there are no YY or YYY disorders.*

Incorrect: *The X chromosome seems to be necessary for life, so there are no YY or YYY disorders.*

Answer: b

Page Reference: 58

Topic: Mechanisms of Heredity

Skill: Factual

67) The branch of genetics that addresses the inheritance of behavioural and psychological traits is referred to as

- a. evocative genetics.
- b. active genetics.
- c. behavioural genetics.
- d. polygenic genetics.

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: c

Page Reference: 59

Topic: Heredity, Environment, and Development

Skill: Factual

68) Behavioural genetics

- a. deals primarily with the inheritance of traits controlled by single genes.
- b. is simple because behavioural and psychological phenotypes are very simple.
- c. deals primarily with either-or cases of inheritance such as red-green colour blindness.
- d. is interested in the range of outcomes associated with different genotypes.

Correct: *Description given in the text*

Incorrect: *Description given in the text*

Answer: d

Page Reference: 59

Topic: Heredity, Environment, and Development

Skill: Conceptual

69) Polygenic inheritance

- a. reflects the influence of a single gene.
- b. determines “either-or” traits such as eye colour.
- c. cannot be studied because its influence is too broad.
- d. influences behavioural and psychological traits such as intelligence.

Correct: *A-C are false, D is the only true statement.*

Incorrect: *A-C are false, D is the only true statement.*

Answer: d

Page Reference: 59

Topic: Heredity, Environment, and Development

Skill: Conceptual

70) *Most behavioural and psychological characteristics follow a(n) _____ pattern of genetic inheritance.

- a. dominant-recessive
- b. incomplete dominance
- c. sex-linked
- d. polygenic

Correct: *Complex traits such as behavioural and psychological characteristics are usually influenced by many genes (polygenic).*

Incorrect: *Complex traits such as behavioural and psychological characteristics are usually influenced by many genes (polygenic).*

Answer: d

Page Reference: 59

Topic: Heredity, Environment, and Development

Skill: Factual

71) Intelligence is

- a. determined by a single gene.
- b. a polygenic trait.
- c. determined by the sex chromosomes.
- d. not influenced by genetic factors.

Correct: *Complex traits such as intelligence are usually influenced by many genes (polygenic).*

Incorrect: *Complex traits such as intelligence are usually influenced by many genes (polygenic).*

Answer: b

Page Reference: 59

Topic: Heredity, Environment, and Development

Skill: Conceptual

72) When phenotypes are caused by the combined effect of many separate genes, the pattern of inheritance is referred to as

- a. polygenic inheritance.

- b. dominant-recessive.
- c. incomplete dominance.
- d. sex-linked inheritance.

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: a

Page Reference: 59

Topic: Heredity, Environment, and Development

Skill: Conceptual

73) Your professor mentions in a lecture that activity level follows a polygenic pattern of inheritance. You, having already read Chapter 2 in your textbook, realize this means that

- a. activity level is a recessive trait.
- b. a single gene determines activity level.
- c. there is no evidence of a genetic influence on activity level.
- d. activity level is determined by the combination of many genes.

Correct: *Polygenic means many (poly) genes (genic).*

Incorrect: *Polygenic means many (poly) genes (genic).*

Answer: d

Page Reference: 59

Topic: Heredity, Environment, and Development

Skill: Applied

74) Twins that come from a single fertilized egg that splits in two are called

- a. dizygotic twins.
- b. monozygotic twins.
- c. fraternal twins.
- d. homozygous.

Correct: *Monozygotic means one (mono) zygote or one fertilized egg that splits in two.*

Incorrect: *Monozygotic means one (mono) zygote or one fertilized egg that splits in two.*

Answer: b

Page Reference: 61

Topic: Heredity, Environment, and Development

Skill: Conceptual

75) Mindy and Mandy are dizygotic twins. Therefore, they

- a. came from two separate eggs.
- b. have the same genes.
- c. have no shared genes.
- d. cannot be used in a twin study.

Correct: *Dizygotic means two (di) zygotes or two separate eggs.*

Incorrect: *Dizygotic means two (di) zygotes or two separate eggs.*

Answer: a

Page Reference: 61

Topic: Heredity, Environment, and Development

Skill: Applied

76) Which pair has the most genes in common?

- a. mother and daughter
- b. identical twins
- c. fraternal twins
- d. brother and sister

Correct: *Identical twins have identical genotypes—100 percent genes in common.*

Incorrect: *Identical twins have identical genotypes—100 percent genes in common.*

Answer: b

Page Reference: 61

Topic: Heredity, Environment, and Development

Skill: Conceptual

77) _____ twins are to identical twins as _____ twins are to fraternal twins.

- a. Homozygous; heterozygous
- b. Heterozygous; homozygous
- c. Dizygotic; monozygotic
- d. Monozygotic; dizygotic

Correct: *Monozygotic twins are identical while dizygotic twins are fraternal.*

Incorrect: *Monozygotic twins are identical while dizygotic twins are fraternal.*

Answer: d

Page Reference: 61

Topic: Heredity, Environment, and Development

Skill: Conceptual

78) Twin studies

- a. cannot be used to study polygenic traits such as intelligence.
- b. are based on the assumption that monozygotic twins are not more similar genetically than dizygotic twins.
- c. are based on the assumption that heredity influences a trait if identical twins are more alike than fraternal twins.
- d. often underestimate the influence of heredity because identical twins may have more similar environments than fraternal twins.

Correct: Since identical twins share 100 percent of their genes they should be more similar than fraternal twins (who only share 50 percent of their genes) on traits where heredity is important.

Incorrect: Since identical twins share 100 percent of their genes they should be more similar than fraternal twins (who only share 50 percent of their genes) on traits where heredity is important.

Answer: c

Page Reference: 61

Topic: Heredity, Environment, and Development

Skill: Conceptual

79) Dr. Tutu uses a twin study to determine the influence of heredity on emotionality. If emotionality is influenced by heredity, he will find that the level of emotionality is more similar in

- a. sibling pairs than in identical twins.
- b. fraternal twins than in sibling pairs.
- c. fraternal twins than in identical twins.
- d. identical twins than in fraternal twins.

Correct: Since identical twins share 100 percent of their genes they should be more similar than fraternal twins (who only share 50 percent of their genes) on traits where heredity is important.

Incorrect: Since identical twins share 100 percent of their genes they should be more similar than fraternal twins (who only share 50 percent of their genes) on traits where heredity is important.

Answer: d

Page Reference: 61

Topic: Heredity, Environment, and Development

Skill: Applied

80) Dr. Banta conducts an adoption study to estimate the heritability of intelligence. If intelligence is primarily influenced by the environment, he will find that

- a. adopted children's intelligence level is more similar to that of their biological parents than that of their adoptive parents.
- b. adopted children's intelligence level is more similar to that of their adoptive parents than that of their biological parents.
- c. adopted children's intelligence level is unrelated to that of either their biological or adoptive parents.
- d. he cannot determine heritability with an adoption study, therefore he will need to do a twin study.

Correct: *Since adopted children share no genes with their adoptive parents but do share genes with their biological parents, they should have more in common with their adoptive parents on traits where environment is more important than heredity.*

Incorrect: *Since adopted children share no genes with their adoptive parents but do share genes with their biological parents, they should have more in common with their adoptive parents on traits where environment is more important than heredity.*

Answer: b

Page Reference: 61

Topic: Heredity, Environment, and Development

Skill: Applied

81) Adoption studies tend to study mothers more often than fathers because

- a. mothers tend to have a stronger genetic influence on their children than fathers do.
- b. mothers tend to have a stronger environmental influence on their children than fathers do.
- c. fathers generally have less genetic and environmental influence on their children's development than mothers do.
- d. it is harder to get information about the fathers than about the mothers.

Correct: *Whereas it is clear who the biological mother is, this is not always true for the biological father, who may be unknown or unavailable.*

Incorrect: *Whereas it is clear who the biological mother is, this is not always true for the biological father, who may be unknown or unavailable.*

Answer: d

Page Reference: 62

Topic: Heredity, Environment, and Development

Skill: Conceptual

- 82) If a trait is strongly influenced by genetic factors you would expect to find that
- adopted children resemble their biological parents more than their adoptive parents on that trait.
 - adopted children resemble their adoptive parents more than their biological parents on that trait.
 - dizygotic twins would be more similar on that trait than monozygotic twins would be.
 - dizygotic twins would be more similar on that trait than siblings would be.

Correct: Since adopted children share no genes with their adoptive parents but do share genes with their biological parents, they should have more in common with their biological parents on traits where heredity is important.

Incorrect: Since adopted children share no genes with their adoptive parents but do share genes with their biological parents, they should have more in common with their biological parents on traits where heredity is important.

Answer: a

Page Reference: 61

Topic: Heredity, Environment, and Development

Skill: Conceptual

83) In adoption studies

- the results may be biased because biological and adoptive parents may be similar.
- adoptive parents are assumed to provide genetic influence.
- biological parents are assumed to provide environmental influence.
- the greater similarity of adoptees to biological than to adoptive parents on a trait would indicate that the trait is influenced by the environment.

Correct: B and D are false, C is rarely true, whereas there is evidence that adoptive and biological parents are more similar than initially suspected.

Incorrect: B and D are false, C is rarely true, whereas there is evidence that adoptive and biological parents are more similar than initially suspected.

Answer: a

Page Reference: 62

Topic: Heredity, Environment, and Development

Skill: Conceptual

84) Adoption studies may be flawed because

- adopted children are more likely than nonadopted children to have genetic disorders.
- the results of adoption studies usually conflict with results of twin studies.

c. agencies may try to place adoptees in environments similar to those of their biological parents.

d. parents treat adopted children differently from biological children.

Correct: *Research indicates that C is true.*

Incorrect: *Research indicates that C is true.*

Answer: c

Page Reference: 62

Topic: Heredity, Environment, and Development

Skill: Conceptual

85) A potential flaw of twin studies is that

a. monozygotic twins do not always have identical genes.

b. dizygotic twins do not have identical genes.

c. parents may treat identical twins more similarly than they treat fraternal twins.

d. parents may treat fraternal twins more similarly than they treat identical twins.

Correct: *Because identical twins look more similar, they may be treated more similarly.*

Incorrect: *Because identical twins look more similar, they may be treated more similarly.*

Answer: c

Page Reference: 62

Topic: Heredity, Environment, and Development

Skill: Conceptual

86) The problems associated with twin studies and adoption studies

a. are not serious enough to cause concern.

b. can be minimized by using both kinds of studies to see if they yield similar results.

c. can be minimized by using only one kind of study so potential flaws are not multiplied.

d. are insurmountable.

Correct: *When both types of studies are used, results have more reliability and validity.*

Incorrect: *When both types of studies are used, results have more reliability and validity.*

Answer: b

Page Reference: 62

Topic: Heredity, Environment, and Development

Skill: Conceptual

- 87) Results of twin and adoption studies suggest that genetics strongly influence
- a. intelligence but do not strongly influence psychological disorders or personality.
 - b. intelligence and psychological disorders but do not strongly influence personality.
 - c. personality and psychological disorders but do not strongly influence intelligence.
 - d. intelligence, psychological disorders, and personality.

Correct: *All three seem to have a strong genetic (heritable) component.*

Incorrect: *All three seem to have a strong genetic (heritable) component.*

Answer: d

Page Reference: 63

Topic: Heredity, Environment, and Development

Skill: Factual

- 88) Sadie is depressed. You would be most likely to find that
- a. Sadie's identical twin is depressed.
 - b. Sadie's adoptive mother is depressed.
 - c. Sadie's brother is depressed.
 - d. no one else in Sadie's family is depressed.

Correct: *There would be a 50 percent chance of Sadie's identical twin being depressed.*

Incorrect: *There would be a 50 percent chance of Sadie's identical twin being depressed.*

Answer: a

Page Reference: 63

Topic: Heredity, Environment, and Development

Skill: Applied

- 89) Brendgen et al.'s (2005) study on aggression in twins found that aggression levels in children are influenced by
- a. heredity only.
 - b. environment only.
 - c. heredity and environment.
 - d. neither heredity nor environment.

Correct: *In studying monozygotic and dizygotic twins, they found that aggression was influenced mainly by heredity, but also by environmental factors.*

Incorrect: *In studying monozygotic and dizygotic twins, they found that aggression was influenced mainly by heredity, but also by environmental factors.*

Answer: c

Page Reference: 65

Topic: Heredity, Environment, and Development

Skill: Factual

90) Whose opinion is best supported by the results of twin and adoption studies?

- a. Aaron, who assumes heredity is solely responsible for behavioural development.
- b. Baron, who believes heredity has a substantial but not total influence on behavioural development.
- c. Karen, who asserts that heredity has virtually no influence on development.
- d. Sharon, who asserts that twin and adoption studies are too flawed to yield accurate information about the influence of genetics on development.

Correct: *Heredity seems to have a substantial influence on development, although environment is certainly important and interacts dynamically with heredity.*

Incorrect: *Heredity seems to have a substantial influence on development, although environment is certainly important and interacts dynamically with heredity.*

Answer: b

Page Reference: 65

Topic: Heredity, Environment, and Development

Skill: Applied

91) The path from genes to behaviour is

- a. one in which genes make particular behaviours more or less likely.
- b. a direct path in which genes directly cause behaviour.
- c. largely known and charted.
- d. not influenced by the environment in which the genetic instructions are carried out.

Correct: *B-D are all false, leaving A as the only possibility.*

Incorrect: *B-D are all false, leaving A as the only possibility.*

Answer: a

Page Reference: 66

Topic: Heredity, Environment, and Development

Skill: Conceptual

92) Benji has the genotype for phenylketonuria. Which of the following statements is true?

- a. Benji will be mentally retarded.

- b. Benji's phenylketonuria is not likely to surface until he reaches middle age.
- c. If Benji avoids consuming phenylalanine he will have normal intelligence.
- d. Benji has a high likelihood of having an older mother.

Correct: *A might be true but doesn't have to be if his diet is monitored, B and D are false.*

Incorrect: *A might be true but doesn't have to be if his diet is monitored, B and D are false.*

Answer: c

Page Reference: 66

Topic: Heredity, Environment, and Development

Skill: Applied

93) Phenylketonuria (PKU) provides a good example of

- a. the interaction between genes and environment.
- b. a disorder caused by a dominant allele.
- c. a chromosomal abnormality caused by an extra chromosome.
- d. a disorder whose effects cannot be changed by the environment.

Correct: *You need both the genotype for PKU and the environment (consumption of phenylalanine) in order to manifest the disease.*

Incorrect: *You need both the genotype for PKU and the environment (consumption of phenylalanine) in order to manifest the disease.*

Answer: a

Page Reference: 66

Topic: Heredity, Environment, and Development

Skill: Conceptual

94) The term "reaction range" refers to the concept that

- a. one phenotype can lead to many different genotypes.
- b. one genotype can lead to different phenotypes.
- c. one genotype leads to one and only one phenotype.
- d. phenotypes are unrelated to genotypes.

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: b

Page Reference: 66

Topic: Heredity, Environment, and Development

Skill: Conceptual

95) Gina has a genotype for average sociability. If she is in an environment where sociability is discouraged, she is likely to be below average in sociability. If she is in an environment where sociability is encouraged, she may be above average in sociability. The fact that Gina's genotype can lead to different phenotypes depending on the environment is a phenomenon referred to as

- a. niche-picking.
- b. an active gene-environment relation.
- c. an evocative gene-environment relation.
- d. a reaction range.

Correct: *The definition of reaction range is that genotypes can lead to different phenotypes depending on the environment.*

Incorrect: *The definition of reaction range is that genotypes can lead to different phenotypes depending on the environment.*

Answer: d

Page Reference: 66

Topic: Heredity, Environment, and Development

Skill: Applied

96) An example of niche-picking is

- a. parents enrolling their active child in many structured, sedentary activities in hopes that he will calm down.
- b. parents enrolling their active child in many athletic activities in hopes that he will burn off some steam.
- c. an active child choosing to participate in many athletic events.
- d. an uncoordinated child choosing to participate in athletic events in hopes of becoming more coordinated.

Correct: *C is the only example of niche-picking, where the owner of the genotype makes the active choice of the environment that supports the genotype.*

Incorrect: *C is the only example of niche-picking, where the owner of the genotype makes the active choice of the environment that supports the genotype.*

Answer: c

Page Reference: 67

Topic: Heredity, Environment, and Development

Skill: Applied

97) Who provides the best example of niche-picking?

- a. Musically-talented Mosi who chooses to spend his free time listening to music and practising his guitar.
- b. Natural singer Vanessa who is often asked to sing by her family and friends.
- c. Tone-deaf Toneesha whose choir director asks her to simply mouth the words rather than sing during performances.
- d. Piano prodigy Philip who not only inherited musical talent from his symphony-playing parents but was encouraged by his parents to begin playing a musical instrument at an early age.

Correct: *A is the only example of niche-picking, where the owner of the genotype makes the active choice of the environment that supports the genotype.*

Incorrect: *A is the only example of niche-picking, where the owner of the genotype makes the active choice of the environment that supports the genotype.*

Answer: a

Page Reference: 67

Topic: Heredity, Environment, and Development

Skill: Applied

98) Niche-picking refers to

- a. one genotype leading to a range of phenotypes, depending on the environment.
- b. children deliberately seeking environments that fit their heredity.
- c. children's heredity eliciting different reactions from the environment.
- d. parents both passing on their genes to their children and providing an environment for their children.

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: b

Page Reference: 67

Topic: Heredity, Environment, and Development

Skill: Conceptual

99) Caris is very artistically talented and chooses to spend much of her time drawing and painting. This is a good example of

- a. a passive gene-environment relation.
- b. an evocative gene-environment relation.
- c. a reaction range.

d. niche-picking.

Correct: *Niche-picking is where children deliberately seek environments that fit their heredity.*

Incorrect: *Niche-picking is where children deliberately seek environments that fit their heredity.*

Answer: d

Page Reference: 67

Topic: Heredity, Environment, and Development

Skill: Applied

100) The environmental forces within a family that make children different from one another are referred to as

- a. an evocative gene-environment relation.
- b. passive gene-environment relation.
- c. incomplete dominance.
- d. nonshared environmental influences.

Correct: *Definition given in the text*

Incorrect: *Definition given in the text*

Answer: d

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Topic: Heredity, Environment, and Development

Skill: Conceptual

101) The fact that children with genes for average intelligence can actually develop either below-average, average, or above-average intelligence depending on their experiences best illustrates which of the following themes of development?

- a. Early development is related to later development, but not perfectly.
- b. Development is always jointly influenced by heredity and environment.
- c. Children help determine their own environment.
- d. Development in different domains is connected.

Correct: *All are true, but B is the only answer that is illustrated by the example.*

Incorrect: *All are true, but B is the only answer that is illustrated by the example.*

Answer: b

Page Reference: 69

Topic: Heredity, Environment, and Development

Skill: Conceptual