Modern Blood Banking & Transfusion Practices 7th edition Harmening Test Bank

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Chapter 2. Basic Genetics

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. When 1,000 donors were tested, 75% were positive for C and 25% were negative for C; the gene frequency of C is:
a. 10.
b. 1.
c. 0.5.
d. 25.

____ 2. All of the following may cause an alteration in DNA, *except*:
a. ultraviolet light.
b. alkylating agents.
c. antibodies.
d. enzymes.

____ 3. How is it genetically possible for a child to type Rh-negative?
a. Both parents are Dd.
b. Both parents are DD.
c. Mom is DD and Dad is Dd.
d. Sibling is Rh-positive.

____ 4. All of the following are included in transcription *except*:
a. mRNA terminates at the 5' end.
b. RNA polymerase II binds to a promoter.
c. it proceeds from the 3' end to the 5' end.
d. the 5' end is capped with a methyl residue.

____ 5. Which of the following best describes the structure of human chromosomes?
a. Linear strands of DNA wound around histones
b. Linear strands of RNA wrapped around histones
c. Tertiary structure of DNA wound around histones
d. Quaternary structure of DNA wound around histones

____ 6. In Mendel's law of separation, the first-filial generation is:
a. recessive.
b. homozygous.
c. heterozygous.
d. autologous.

____ 7. A father carries the Xg^a trait and passes it on to all of his daughters but none of his sons. What type of inheritance does this represent?
a. Autosomal dominant
b. X-linked dominant
c. X-linked recessive
d. Autosomal recessive

____ 8. Methods to isolate intact DNA in order for it to be studied include all of the following *except*:
a. pH changes.
b. enzyme activation.
c. detergent lysis.
d. heat treatment.

____ 9. Point mutations include which of the following?
a. Substitutions
b. Insertions
c. Deletions
d. Substitutions, insertions, and deletions

____ 10. Which of the following best describes the process of mitosis?
a. Cell division by which only one-half of the daughter cells produced are identical to the parent cell

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b. Cell division of germ cells by which two successive divisions of the nucleus produce cells that contain half the number of chromosomes of somatic cells
c. Cell division that produces two daughter cells having the same number of chromosomes as the parent
d. Cell division that produces four daughter cells (4n)

____ 11. All of the following processes occur in replication, *except*:
a. the two DNA strands separate via helicase.
b. DNA polymerase acts on the 5' to 3' parent strand to produce an anticomplementary duplicate strand.
c. DNA polymerase acts on the 3' to 5' parent strand to produce an anticomplementary duplicate strand.
d. replication of the 3' to 5' parent strand is initiated by the enzyme primase, which anneals to the parent strand.

____ 12. Which type of genetic change (mutation) is incapable of reverting back to the original phenotype?
a. Duplication
b. Deletion
c. Recombination
d. Insertion

____ 13. In the MN blood group system, a person who inherits an "M" allele and an "N" allele expresses both M and N antigens on the RBCs. Which of the following is true?
a. M is dominant to N.
b. N is dominant to M.
c. M an N are codominant alleles.
d. M and N are located on the same chromosome.

____ 14. A gene, such as the *O* gene, that produces no detectable product is called:
a. an amorph.
b. a trait.
c. an allele.
d. recessive.

____ 15. What blood group is the best example of codominantly inherited blood group genes?
a. Rh
b. MN
c. Lewis
d. ABO

____ 16. When an individual is said to have blood group A, it refers to the individual's:
a. alleles on the chromosome.
b. genotype.
c. phenotype.
d. haplotype.

____ 17. The two strands of DNA are: _____; one runs in a 5' to 3' direction, and the other runs in a 3' to 5' direction.
a. parallel
b. antiparallel
c. somatic
d. zigzag

____ 18. In what stage of mitosis is DNA *not* actively dividing?
a. Interphase
b. Prophase
c. Metaphase
d. Anaphase

____ 19. How many chromosomes do somatic cells of humans have?
a. 46
b. 50
c. 23
d. 100

____ 20. The diploid chromosome number in humans is:
a. 12
c. 46

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b. 23
d. 92

____ 21. Which constituent in the Hardy-Weinberg equation represents the total number of alleles?
a. q
b. p
c. 2pq
d. q^2

____ 22. In which of the following circumstances will Hardy-Weinberg's principle fail?
a. Mutation
b. Genetic drift
c. Nonrandom mating
d. All the above

____ 23. What amino acid initiates translation by attaching to tRNA?
a. Glycine
b. Alanine
c. Methionine
d. Lysine

____ 24. What is meant by the term *autosomal*?
a. Trait is not carried on the sex chromosomes
b. Trait is carried on sex chromosomes
c. Trait is not expressed in the parents
d. Organism possesses different alleles for a given characteristic

____ 25. Which of the following best describes classical genetics?
a. DNA alteration that is caused by a physical or chemical agent
b. Transmission of characteristics from parents to offspring
c. Possessing a pair of identical alleles
d. The synthesis of RNA from DNA requiring RNA polymerase

____ 26. How is RNA different from DNA?
a. RNA usually exists as one strand
b. Ribose is substituted for deoxyribose
c. RNA incorporates uracil
d. All of the above

____ 27. Using the Hardy-Weinberg equation, if a total random population carried the dominant allele E and 20% carried the recessive allele e, what would the total percentage be for the recessive trait ee?
a. 64%
b. 4%
c. 16%
d. 0.4%

____ 28. A triple set of nucleotides is a:
a. helix.
b. base.
c. codon.
d. template.

____ 29. A human gamete (egg or sperm) contains how many chromosomes?
a. 23 pairs
b. 46 pairs
c. 23 chromosomes
d. 46 chromosomes

____ 30. How do restriction endonucleases function?
a. Disrupt hydrogen bonding in DNA structure
b. Promote digestion of RNA
c. Cut DNA into smaller fragments
d. Terminate translation of mRNA

____ 31. DNA is composed of all of the following *except*:
a. adenine.
b. guanine.
c. cytosine.
d. uracil.

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____ 32. A woman with blood group A marries a man with blood group O. Their firstborn child has blood group O. The mother's most probable genotype is:
a. OO
b. AA
c. AB
d. AO

____ 33. A structural alteration of DNA in an organism that is caused by a physical or chemical agent is called:
a. transcription.
b. translation.
c. mutation.
d. cloning.

____ 34. In a pedigree analysis, what do vertical lines indicate?
a. Consanguineous mating
b. Offspring
c. Stillbirth
d. Deceased sibling

____ 35. What is a vector?
a. Substance capable of catalyzing a reaction
b. Sequence of three bases in a strand of DNA
c. Extrachromosomal genetic element that can carry a recombinant DNA molecule into a host bacterial cell
d. Substance that can carry an electric current in solution

____ 36. Which of the following must be true when using the Hardy-Weinberg equation?
a. The population must be large
b. Mutations cannot occur
c. Mating must occur randomly
d. All of the above

____ 37. Alternate forms of a gene that can occur at a single chromosome locus are referred to as:
a. amorphs.
b. traits.
c. alleles.
d. recessive.

____ 38. The condition in which one chromosome has a copy of the gene and the other chromosome has that gene deleted or absent is referred to as:
a. homozygous.
b. heterozygous.
c. hemizygous.
d. recessive.

____ 39. Most antigens in the various blood group systems follow what kind of inheritance patterns?
a. Codominant
b. Homozygous
c. Dominant
d. Autosomal

____ 40. All of the following are consistent with Mendel's basic rules of inheritance *except*:
a. the gene is transmitted through generations intact.
b. a pair of genes is always found in the same gamete.
c. different pairs of genes are assorted independently of each other.
d. a pair of genes is rarely found in the same gamete.

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Chapter 2. Basic Genetics
Answer Section

MULTIPLE CHOICE

1.	ANS:	C	PTS: 1	KEY:	Taxonomy Level: 3	LO: 2-4
2.	ANS:	D	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-9
3.	ANS:	A	PTS: 1	KEY:	Taxonomy Level: 2	LO: 2-2
4.	ANS:	A	PTS: 1	KEY:	Taxonomy Level: 2	LO: 2-8
5.	ANS:	A	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-8
6.	ANS:	C	PTS: 1	KEY:	Taxonomy Level: 2	LO: 2-1
7.	ANS:	B	PTS: 1	KEY:	Taxonomy Level: 2	LO: 2-2
8.	ANS:	D	PTS: 1	KEY:	Taxonomy Level: 2	LO: 2-11
9.	ANS:	D	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-9
10.	ANS:	C	PTS: 1	KEY:	Taxonomy Level: 2	LO: 2-6
11.	ANS:	C	PTS: 1	KEY:	Taxonomy Level: 2	LO: 2-8
12.	ANS:	B	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-9
13.	ANS:	C	PTS: 1	KEY:	Taxonomy Level: 2	LO: 2-2
14.	ANS:	A	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-2
15.	ANS:	B	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-2
16.	ANS:	C	PTS: 1	KEY:	Taxonomy Level: 2	LO: 2-2
17.	ANS:	B	PTS: 1	KEY:	Taxonomy Level: 2	LO: 2-8
18.	ANS:	A	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-6
19.	ANS:	A	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-7
20.	ANS:	C	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-7
21.	ANS:	B	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-3
22.	ANS:	D	PTS: 1	KEY:	Taxonomy Level: 2	LO: 2-3
23.	ANS:	C	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-8
24.	ANS:	A	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-7
25.	ANS:	B	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-8
26.	ANS:	D	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-8
27.	ANS:	B	PTS: 1	KEY:	Taxonomy Level: 3	LO: 2-4
28.	ANS:	C	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-8
29.	ANS:	C	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-8
30.	ANS:	C	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-12
31.	ANS:	D	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-8
32.	ANS:	D	PTS: 1	KEY:	Taxonomy Level: 2	LO: 2-5
33.	ANS:	C	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-9
34.	ANS:	B	PTS: 1	KEY:	Taxonomy Level: 2	LO: 2-5
35.	ANS:	C	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-12
36.	ANS:	D	PTS: 1	KEY:	Taxonomy Level: 2	LO: 2-3
37.	ANS:	C	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-10
38.	ANS:	C	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-9
39.	ANS:	A	PTS: 1	KEY:	Taxonomy Level: 1	LO: 2-11
40.	ANS:	B	PTS: 1	KEY:	Taxonomy Level: 2	LO: 2-1

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