Chapter 2. Basic Genetics

Multiple Choice

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

1							
	1. When 1,000 donors were tested, 75% were	e positive for C and 25% were negative for C; the gene frequency					
	C is:						
	a. 10.	c. 0.5.					
	b. 1.	d. 25.					
2	2. All of the following may cause an alteration	on in DNA, <i>except</i> :					
	a. ultraviolet light.	c. antibodies.					
	b. alkylating agents.	d. enzymes.					
3	How is it genetically possible for a child to type Rh-negative?						
	a. Both parents are Dd.	c. Mom is DD and Dad is Dd.					
	b. Both parents are DD.	d. Sibling is Rh-positive.					
4	4. All of the following are included in transcription <i>except</i> :						
	a. mRNA terminates at the 5' end.						
	b. RNA polymerase II binds to a promot	er.					
	c. it proceeds from the 3' end to the 5' er						
	d. the 5' end is capped with a methyl res						
5	5. Which of the following best describes the	structure of human chromosomes?					
	a. Linear strands of DNA wound around						
	b. Linear strands of RNA wrapped arour						
	c. Tertiary structure of DNA wound aro						
	d. Quaternary structure of DNA wound						
6	6. In Mendel's law of separation, the first-fili	al generation is:					
	a. recessive.	c. heterozygous.					
	b. homozygous.	d. autologous.					
7	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	c. X-linked recessive					
	b. X-linked dominant	d. Autosomal recessive					
8	8. Methods to isolate intact DNA in order for	t to be studied include all of the following <i>except</i> :					
	a. pH changes.	c. detergent lysis.					
	b. enzyme activation.	d. heat treatment.					
	·						
9	9. Point mutations include which of the follo	wing?					
	a. Substitutions						
	b. Insertions						
	c. Deletions						
	c. Deletionsd. Substitutions, insertions, and deletion	S					
10	d. Substitutions, insertions, and deletion0. Which of the following best describes the						

a. Cell division by which only one-half of the daughter cells produced are identical to the parent cell

 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, <i>except</i>: 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. Duplicationc. Recombinationb. Deletiond. 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. Rhc. Lewisb. MNd. ABO					
 16.	When an individual is said to have blood group A, it refers to the individual's:a. alleles on the chromosome.c. phenotype.b. genotype.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 c. somatic b. antiparallel d. zigzag					
 18.	In what stage of mitosis is DNA not actively dividing?a. Interphasec. Metaphaseb. Prophased. Anaphase					
 19.	How many chromosomes do somatic cells of humans have?a. 46c. 23b. 50d. 100					
 20.	The diploid chromosome number in humans is:a. 12c. 46					

	b. 23	d.	92			
21	1. Which constituent in the Hardy-Weinberg equ	Which constituent in the Hardy-Weinberg equation represents the total number of alleles?				
	a. q	c.	2pq			
	b. p	d.	q^2			
22	2. In which of the following circumstances will	Hard	y-Weinberg's principle fail?			
	a. Mutation	-	Nonrandom mating			
	b. Genetic drift	d.	All the above			
23	3. What amino acid initiates translation by attack	hing t	to tRNA?			
	a. Glycine	-	Methionine			
	b. Alanine	d.	Lysine			
24	4. What is meant by the term <i>autosomal</i> ?					
	a. Trait is not carried on the sex chromoson	nes				
	b. Trait is carried on sex chromosomes					
	c. Trait is not expressed in the parents					
	d. Organism possesses different alleles for a	a give	en characteristic			
25	5. Which of the following best describes classic	Which of the following best describes classical genetics?				
	a. DNA alteration that is caused by a physic	cal or	chemical agent			
	b. Transmission of characteristics from pare	ents to	offspring			
	c. Possessing a pair of identical alleles		NYA 1			
	d. The synthesis of RNA from DNA requiri	ing R	NA polymerase			
26						
	a. RNA usually exists as one strand		RNA incorporates uracil			
	b. Ribose is substituted for deoxyribose	d.	All of the above			
27	7. Using the Hardy-Weinberg equation, if a total	l rand	lom population carried the dominant allele E and 20%			
	carried the recessive allele e, what would the					
	a. 64%		16%			
	b. 4%	d.	0.4%			
28	8. A triple set of nucleotides is a:					
	a. helix.		codon.			
	b. base.	d.	template.			
29	A human gamete (egg or sperm) contains how many chromosomes?					
	a. 23 pairs	c.	23 chromosomes			
	b. 46 pairs	d.	46 chromosomes			
30	0. How do restriction endonucleases function?					
	a. Disrupt hydrogen bonding in DNA struct	ture				
	b. Promote digestion of RNA					
	c. Cut DNA into smaller fragments					
	d. Terminate translation of mRNA					
31	1. DNA is composed of all of the following <i>exce</i>	ept:				
	a. adenine.	c.	cytosine.			
	b. guanine.	d.	uracil.			

- 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 c. AB b. AA d. AO 33. A structural alteration of DNA in an organism that is caused by a physical or chemical agent is called: c. mutation. a. transcription. b. translation. d. cloning.
- 34. In a pedigree analysis, what do vertical lines indicate?
 - a. Consanguineous mating
- c. Stillbirth

b. Offspring

d. Deceased sibling

35. What is a vector?

a.

- 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
- Which of the following must be true when using the Hardy-Weinberg equation? 36.
 - The population must be large c. Mating must occur randomly
 - b. Mutations cannot occur 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. c. alleles.
 - b. traits. 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. c. hemizygous.
 - b. heterozygous. d. recessive.
- 39. Most antigens in the various blood group systems follow what kind of inheritance patterns?
 - a. Codominant c. Dominant
 - b. Homozygous d. Autosomal
- All of the following are consistent with Mendel's basic rules of inheritance *except*: 40.
 - 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.

Chapter 2. Basic Genetics Answer Section

MULTIPLE CHOICE

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