Exam

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Genetics is the study of 1) _____
A) how life originated.
B) variation of inherited traits.
C) how organisms reproduce.
D) how the environment causes disease.

2) In which choice are the entries listed from smallest to largest? 2) _____
A) Chromosome - genome - cell - DNA building block
B) Gene - cell - DNA - genome
C) DNA building block - RNA building block - protein
D) DNA building block - gene - chromosome - genome

3) The complete genetic material of an organism is its 3) _____
A) chromosome. B) phenotype.
C) genotype. D) genome.

4) The number of copies of our genome in most of our cells is _____. 4) _____
A) 1 B) 2 C) 3 D) 4

5) An estimated _____ DNA base pairs comprise the human genome. 5) _____
A) 3.2 billion B) 32,000 C) 3.2 million D) 320,000

6) The field of _____ was founded in the 1970s to address moral issues and controversies that arise in applying medical technology. 6) _____
A) metaethics B) genetics
C) bioethics D) biotechnology

7) Variants of a gene are called 7) _____
A) phenotypes. B) alleles.
C) genotypes. D) single nucleotide polymorphisms.

8) Humans have _____ pairs of chromosomes. 8) _____
A) 38 B) 23 C) 32 D) 46

9) A change in a gene's DNA sequence is a(n) 9) _____
A) mutation. B) genome. C) nucleotide. D) genotype.

10) In general, RNA molecules 10) _____
A) serve as messengers to allow the information in DNA to be used to construct proteins.
B) entwine with DNA molecules to encode proteins.
C) form double helices that encode DNA sequences.
D) comprise the chromosomes.

11) A genotype refers to 11) _____
A) the environmental components of a trait.
B) the alleles present in an individual.
C) the number of chromosomes that a person has.
D) expression patterns of certain genes.

12) A chart that displays paired chromosomes in order of size is a 12) _____
A) genotype. B) genome. C) karyotype. D) phenotype.

13) A human cell has 13) _____
A) 22 pairs of autosomes and one pair of sex chromosomes.
B) 23 pairs of autosomes and a pair of Y chromosomes.
C) 22 pairs of sex chromosomes and one pair of autosomes.
D) 23 pairs of autosomes.

14) The Y chromosome 14) _____
A) is present in all humans.
B) contains discontinuous DNA sequence.
C) is a sex chromosome.
D) forms the somatic cells.

15) Polydactyly is considered a Mendelian trait because 15) _____
A) it affects the stem cells.
B) it is caused by a single gene.
C) it is caused by linked genes.
D) it is caused due to environmental factors.

16) Which of the following traits is considered Mendelian? 16) _____
A) A trait which is multifactorial
B) A trait which is caused by a single gene
C) A trait which is caused by environmental factors
D) A trait which is caused by linked genes

17) One way to study the human genome is to 17) _____
A) determine the DNA sequence.
B) determine the twisting patterns of the two sides of the double helix.
C) determine the sequence of sugars and phosphates.
D) conduct a phenotype-wide association study.

18) During transcription, the sequence of one strand of a DNA molecule is copied into a related molecule, known as a 18) _____
A) protein. B) gene.
C) genome. D) messenger RNA.

19) A human body has about _____ cells. 19) _____
A) 10 to 100 million B) 30 trillion
C) 3.2 billion D) 20,600

20) Cells differentiate by 20) _____
A) expressing different subsets of genes.
B) activating all of the DNA that encodes protein.
C) becoming stem cells.
D) expressing the entire genome, then silencing some genes.

21) The difference between phenotype and genotype is that 21) _____
A) phenotype refers to the genetic instructions and genotype to their expression.
B) the phenotype is RNA and the genotype is DNA.
C) the phenotype is DNA and the genotype is RNA.
D) genotype refers to the genetic instructions and phenotype to their expression.

22) Shawn's mother and Heather's mother are sisters. Shawn and Heather have _____ of their genes in common. 22) _____
A) 1/2 B) 1/8 C) 1/4 D) 1/16

23) A gene pool consists of all the alleles in a(n) 23) _____
A) family. B) population.
C) neighborhood. D) individual.

24) A trait or disorder that is multifactorial is 24) _____
A) caused by a single gene, with no environmental input.
B) found only in one part of the world.
C) present in more than one family member.
D) caused by one or more genes and environmental influences.

25) Kanisha and her friend both receive their grades for their physics midterms. Kanisha got an A, but her friend received a D. "You must have the physics gene," remarks her friend. "I don't. I might as well not bother studying." The friend's attitude illustrates the idea of 25) _____

A) genetic determinism.
B) genetic modification.
C) genetic engineering.
D) genetic discrimination.

26) Body weight must be a multifactorial trait because 26) _____

A) it is within a certain range.
B) it is obviously inherited.
C) it responds to lifestyle changes.
D) it is inherited to an extent, but can be altered by diet and/or exercise.

27) Identifying individual drug reactions based on genetics is a growing field called 27) _____

A) genetic mapping.
B) pharmacogenetics.
C) applied pharmacology.
D) genetic determinism.

28) A test performed on secretions on a piece of fabric left at a crime scene that is used to implicate an apprehended suspect is 28) _____

A) DNA sharing.
B) DNA replication.
C) DNA profiling.
D) RNA transcription.

29) Nacho suffers from terrible migraine headaches. He enters a clinical trial to test whether certain single nucleotide polymorphisms (SNPs) are associated with response to one drug but not another. This is an approach called 29) _____

A) genetic determinism.
B) applied pharmacology.
C) gene therapy.
D) pharmacogenetics.

30) DNA profiling has been used to 30) _____

A) predict how children will do in school.
B) identify victims of terrorist attacks and natural disasters.
C) treat male infertility.
D) cure metabolic diseases caused by mutations in single genes.

31) DNA profiling is helpful in 31) _____

A) curing cancer.
B) treating male infertility.
C) analyzing food.
D) preventing male pattern baldness.

32) What is the name of the field that is revealing and describing much of the invisible living world by sequencing all of the DNA in a particular habitat? 32) _____

A) Biochemistry
B) Stem cell science
C) Metagenomics
D) Bioethics

33) Sequencing all the DNA in the fluid that leaks from the bottom of a garbage can is an example of 33) _____
A) DNA profiling.
B) metagenomics.
C) stem cell science.
D) gene expression profiling.

34) How do researchers in the metagenomics sector operate? 34) _____
A) They study Mendelian traits in children.
B) They collect and sequence DNA, then consult databases of known genomes to imagine what the organisms to which the DNA belongs might be like.
C) They link diseases by shared gene expression.
D) They detect mutations in the protein encoding part of an individual's genome by using powerful algorithms.

35) Select the example of genetics. 35) _____
A) Studying how a disease gene is transmitted within a royal family
B) Studying the shape and size of dinosaur fossils
C) Studying how various members of a royal family are related
D) Studying how the different organelles in a cell work

36) A group of scientists meet to discuss the legal implications of genome editing in humans. This is an example of 36) _____
A) bioethics.
B) DNA profiling.
C) metagenomics.
D) geneaology.

37) Sickle-cell anemia results from a beta-globin protein containing the amino acid valine in the place of the amino acid glutamic acid. This is an example of a _____ causing a disease. 37) _____
A) gene pool
B) mutation
C) microbiome
D) multifactorial trait

38) What is the exome? 38) _____
A) Sequences in between protein-encoding genes
B) All of the proteins in a cell
C) Protein-encoding genes
D) All the DNA in a genome

39) Based on your knowledge of genetics and evolution, to which listed organism are humans most closely related at the genome level? 39) _____
A) Roses B) Slugs C) Dogs D) Bacteria

40) Select the example of traditional breeding. 40) _____

A) Placing genes into wheat to aid in disease resistance
B) Adding genes to tomatoes to help them taste better
C) Placing human genes into bacteria for production of drugs
D) Mating dogs with other dogs based on traits such as size, fur color, and temperament

41) The CRISPR-Cas9 system is a tool to perform 41) _____

A) DNA profiling. B) genome editing.
C) pharmacogenetics. D) exome sequencing.

42) What type of disease would not be identified by exome sequencing? 42) _____

A) A disorder caused by a mutation that causes one amino acid to be switched for another amino acid
B) A disorder caused by a mutation that causes amino acids to be added to a protein
C) A disorder that is caused by a mutation in a non-coding region of DNA found far away from the gene it affects
D) A disorder caused by a deletion of a large part of a gene

43) What is sequenced in exome sequencing? 43) _____

A) The parts of the genome that encode proteins
B) The entire genome
C) The parts of the DNA that are mutated
D) The parts of the genome that do not encode proteins

44) Approximately how many genes comprise the human exome? 44) _____

A) 2,000 B) 20,000 C) 20 million D) 200,000

Answer Key
Testname: UNTITLED1

1) B
2) D
3) D
4) B
5) A
6) C
7) B
8) B
9) A
10) A
11) B
12) C
13) A
14) C
15) B
16) B
17) A
18) D
19) B
20) A
21) D
22) B
23) B
24) D
25) A
26) D
27) B
28) C
29) D
30) B
31) C
32) C
33) B
34) B
35) A
36) A
37) B
38) C
39) C
40) D
41) B
42) C

43) A
44) B