Exam

Name_____

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

1) A test performed on secretions on a piece of fabric left at a crime scene that is used to implicate an apprehended suspect is 1) _____
A) DNA profiling. B) RNA transcription.
C) DNA sharing. D) DNA replication.

Answer: A
Explanation: A)
B)
C)
D)

2) DNA profiling is helpful in 2) _____
A) curing cancer. B) preventing male pattern baldness.
C) treating male infertility. D) analyzing food.

Answer: D
Explanation: A)
B)
C)
D)

3) Select the example of genetics. 3) _____
A) Studying how the different organelles in a cell work
B) Studying the shape and size of dinosaur fossils
C) Studying how a disease gene is transmitted within a royal family
D) Studying how various members of a royal family are related

Answer: C
Explanation: A)
B)
C)
D)

4) A genotype refers to 4) _____

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

Answer: B
Explanation: A)
B)
C)
D)

5) What is sequenced in exome sequencing? 5) _____

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

Answer: C
Explanation: A)
B)
C)
D)

6) 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 6) _____

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

Answer: D
Explanation: A)
B)
C)
D)

7) How do researchers in the metagenomics sector operate? 7) _____

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

Answer: C
Explanation: A)
B)
C)
D)

8) DNA profiling has been used to 8) _____

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

Answer: C
Explanation: A)
B)
C)
D)

9) The difference between phenotype and genotype is that 9) _____

A) the phenotype is DNA and the genotype is RNA.
B) phenotype refers to the genetic instructions and genotype to their expression.
C) the phenotype is RNA and the genotype is DNA.
D) genotype refers to the genetic instructions and phenotype to their expression.

Answer: D
Explanation: A)
B)
C)
D)

10) Humans have _____ pairs of chromosomes. 10) _____

A) 38 B) 46 C) 32 D) 23

Answer: D
Explanation: A)
B)
C)
D)

11) In which choice are the entries listed from smallest to largest? 11) _____

A) Gene - cell - DNA - genome
B) Chromosome - genome - cell - DNA building block
C) DNA building block - gene - chromosome - genome
D) DNA building block - RNA building block - protein

Answer: C
Explanation: A)
B)
C)
D)

12) Sequencing all the DNA in the fluid that leaks from the bottom of a garbage can is an example of 12) _____

A) DNA profiling.
B) metagenomics.
C) stem cell science.
D) gene expression profiling.

Answer: B
Explanation: A)
B)
C)
D)

13) Variants of a gene are called 13) _____

A) genotypes.
B) alleles.
C) single nucleotide polymorphisms.
D) phenotypes.

Answer: B
Explanation: A)
B)
C)
D)

14) In general, RNA molecules 14) _____

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

Answer: D
Explanation: A)
B)
C)
D)

15) A change in a gene's DNA sequence is a(n) 15) _____
A) genome. B) nucleotide. C) genotype. D) mutation.

Answer: D
Explanation: A)
B)
C)
D)

16) A gene pool consists of all the alleles in a(n) 16) _____
A) neighborhood. B) family.
C) individual. D) population.

Answer: D
Explanation: A)
B)
C)
D)

17) Approximately how many genes comprise the human exome? 17) _____
A) 2,000 B) 200,000 C) 20,000 D) 20 million

Answer: C
Explanation: A)
B)
C)
D)

18) The complete genetic material of an organism is its 18) _____
A) phenotype. B) genome.
C) chromosome. D) genotype.

Answer: B
Explanation: A)
B)
C)
D)

19) 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? 19) _____
A) Metagenomics B) Stem cell science
C) Bioethics D) Biochemistry

Answer: A
Explanation: A)
B)
C)
D)

20) Polydactyly is considered a Mendelian trait because 20) _____

A) it is caused by linked genes.
B) it is caused by a single gene.
C) it affects the stem cells.
D) it is caused due to environmental factors.

Answer: B
Explanation: A)
B)
C)
D)

21) 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 21) _____

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

Answer: A
Explanation: A)
B)
C)
D)

22) Select the example of traditional breeding. 22) _____

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

Answer: C
Explanation: A)
B)
C)
D)

23) The Y chromosome 23) _____

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

Answer: D
Explanation: A)
B)
C)
D)

24) Genetics is the study of 24) _____

A) how life originated.
B) how organisms reproduce.
C) how the environment causes disease.
D) variation of inherited traits.

Answer: D
Explanation: A)
B)
C)
D)

25) A group of scientists meet to discuss the legal implications of genome editing in humans. This is an example of 25) _____

A) geneaology. B) DNA profiling.
C) metagenomics. D) bioethics.

Answer: D
Explanation: A)
B)
C)
D)

26) The CRISPR-Cas9 system is a tool to perform 26) _____

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

Answer: B
Explanation: A)
B)
C)
D)

27) The number of copies of our genome in most of our cells is _____. 27) _____

A) 1 B) 2 C) 3 D) 4

Answer: B

Explanation: A)
B)
C)
D)

28) Which of the following traits is considered Mendelian? 28) _____

A) A trait which is caused by environmental factors
B) A trait which is caused by a single gene
C) A trait which is caused by linked genes
D) A trait which is multifactorial

Answer: B

Explanation: A)
B)
C)
D)

29) 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. 29) _____

A) mutation B) gene pool
C) multifactorial trait D) microbiome

Answer: A

Explanation: A)
B)
C)
D)

30) The field of _____ was founded in the 1970s to address moral issues and controversies that arise in applying medical technology. 30) _____

A) genetics B) bioethics
C) metaethics D) biotechnology

Answer: B

Explanation: A)
B)
C)
D)

31) Based on your knowledge of genetics and evolution, to which listed organism are humans most closely related at the genome level? 31) _____

A) Roses B) Dogs C) Bacteria D) Slugs

Answer: B

Explanation: A)
B)
C)
D)

32) A human cell has 32) _____

A) 22 pairs of autosomes and one pair of sex chromosomes.
B) 23 pairs of autosomes.
C) 23 pairs of autosomes and a pair of Y chromosomes.
D) 22 pairs of sex chromosomes and one pair of autosomes.

Answer: A

Explanation: A)
B)
C)
D)

33) Shawn's mother and Heather's mother are sisters. Shawn and Heather have _____ of their genes in common. 33) _____

A) 1/8 B) 1/2 C) 1/4 D) 1/16

Answer: A

Explanation: A)
B)
C)
D)

34) One way to study the human genome is to 34) _____

A) determine the sequence of sugars and phosphates.
B) conduct a phenotype-wide association study.
C) determine the twisting patterns of the two sides of the double helix.
D) determine the DNA sequence.

Answer: D

Explanation: A)
B)
C)
D)

35) An estimated _____ DNA base pairs comprise the human genome. 35) _____

A) 3.2 billion B) 3.2 million C) 320,000 D) 32,000

Answer: A

Explanation: A)
B)
C)
D)

36) What type of disease would not be identified by exome sequencing? 36) _____

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 caused by a deletion of a large part of a gene

D) A disorder that is caused by a mutation in a non-coding region of DNA found far away from the gene it affects

Answer: D

Explanation: A)
B)
C)
D)

37) Body weight must be a multifactorial trait because 37) _____

A) it responds to lifestyle changes.

B) it is within a certain range.

C) it is inherited to an extent, but can be altered by diet and/or exercise.

D) it is obviously inherited.

Answer: C

Explanation: A)
B)
C)
D)

38) A chart that displays paired chromosomes in order of size is a 38) _____

A) genome. B) genotype. C) karyotype. D) phenotype.

Answer: C

Explanation: A)
B)
C)
D)

39) A trait or disorder that is multifactorial is 39) _____
A) caused by one or more genes and environmental influences.
B) found only in one part of the world.
C) caused by a single gene, with no environmental input.
D) present in more than one family member.

Answer: A
Explanation: A)
B)
C)
D)

40) What is the exome? 40) _____
A) Protein-encoding genes
B) All the DNA in a genome
C) All of the proteins in a cell
D) Sequences in between protein-encoding genes

Answer: A
Explanation: A)
B)
C)
D)

41) Cells differentiate by 41) _____
A) expressing different subsets of genes.
B) expressing the entire genome, then silencing some genes.
C) becoming stem cells.
D) activating all of the DNA that encodes protein.

Answer: A
Explanation: A)
B)
C)
D)

42) During transcription, the sequence of one strand of a DNA molecule is copied into a related molecule, known as a 42) _____
A) gene.
B) protein.
C) messenger RNA.
D) genome.

Answer: C
Explanation: A)
B)
C)
D)

43) A human body has about _____ cells. 43) _____

A) 30 trillion
B) 20,600
C) 3.2 billion
D) 10 to 100 million

Answer: A
Explanation: A)
B)
C)
D)

44) Identifying individual drug reactions based on genetics is a growing field called 44) _____

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

Answer: D
Explanation: A)
B)
C)
D)