Test Bank for Genetics - Analysis and Principles 8th Brooker

Chapter 01 Test Bank: Overview of Genetics

CORRECT ANSWERS ARE LOCATED IN THE 2ND HALF OF THIS DOC.

CHECK ALL THE APPLY. Choose all options that best completes the statement or answers the question.

1) Select the examples of genetics.
   A) Studying the genes that control eye color
   B) Studying traits linked to a certain disease
   C) Studying how a disease gene is passed through a family
   D) Making a family tree that traces your family back to the Mayflower

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

2) The basic unit of heredity is the_____.
   A) individual
   B) gene
   C) macromolecule
   D) trait
   E) none of the answers are correct

3) A variation of a gene is called a or an_____.
   A) species
   B) morph
   C) genome
   D) allele
   E) proteome

4) Which of the following acts to accelerate chemical reactions in a cell?
   A) Nucleic acids
   B) Lipids
   C) Carbohydrates
   D) Enzymes
   E) DNA

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5) The building blocks of DNA are_____.
   A) amino acids
   B) carbohydrates
   C) enzymes
   D) nucleotides
   E) lipids

6) If a carbohydrate is going to be broken down for energy, which of the following molecules would be directly involved in the breakdown?
   A) Catabolic enzymes
   B) Nucleotides
   C) Anabolic enzymes
   D) Lipids
   E) Chromosomes

7) RNA is formed by the process of_____.
   A) transcription
   B) translation
   C) both transcription and translation
   D) Replication

8) A characteristic that an organism displays is called_____.
   A) a gene
   B) a chromosome
   C) DNA
   D) gene expression
   E) a trait

9) The level of study of genetics where the prevalence of a trait in a species is investigated is known as_____.
   A) population genetics
   B) organismal genetics
   C) cellular genetics
   D) molecular genetics

10) The study of the processes of transcription and translation is at what level of biological organization?

A) Population
B) Organismal
C) Cellular
D) Molecular

11) Alternate versions of a specific gene are called_____.

A) nucleotides
B) chromosomes
C) alleles
D) traits

12) Genetic variation is ultimately based upon which of the following?

A) Morphological differences
B) Small variations in nucleotide sequence of the DNA
C) Carbohydrate content of the cell
D) Translation

13) An organism whose cells contains two copies of each chromosome is called_____.

A) a genetic mutation
B) a morph
C) haploid
D) diploid
E) alleles

14) A cell that makes up the body structure of an organism and is diploid is_____.

A) a gamete
B) a somatic cell
C) an allele
D) rare
E) a sperm cell

15) In many organisms, one set of chromosomes comes from the maternal parent, while the other set comes from the paternal parent. Similar chromosomes in these sets are said to be_____.

A) morphs
B) alleles
C) haploid
D) homologs
E) physiological traits

16) In humans, gametes are different than other cells of the body in that they are_____.

A) diploid
B) haploid
C) genetic mutations
D) morphs

17) Which of the following is correct regarding natural selection?

A) It is not based on competition for resources.
B) Beneficial traits are not passed on to the next generation.
C) It does not enable a species to become better adapted to its environment.
D) It may drastically change a species over time.

18) The use of a gene sequence to synthesize a functional protein is known as_____.

A) loss-of-function mutation
B) gene expression
C) the human genome project
D) proteomics

19) The differences in inherited traits among individuals in a population are called_____.

A) species variation
B) genetic mutations
C) genetic variation
D) natural selection

20) Three populations of a type of animal, each with drastically different external markings, but still members of the same species, would be called_____.
A) homologs
B) mutants
C) communities
D) alleles
E) morphs

21) The changes in the genetic makeup of a population over time is called_____.
A) homologous recombination
B) model organisms studies
C) genetic crosses
D) biological evolution
E) hypothesis testing

22) Which level of genetics studies the effects of loss-of-function mutations?
A) Population genetics
B) Transmission genetics
C) Molecular genetics

23) Which level of genetics would use a genetic cross to determine patterns of inheritance?
A) Population genetics
B) Transmission genetics
C) Molecular genetics

24) Which level of genetics studies the relationship between genetic variation and the environment?
A) Population genetics
B) Transmission genetics
C) Molecular genetics

25) Which level of genetics began with the work of Gregor Mendel in the 19th century?
A) Population genetics
B) Transmission genetics
C) Molecular genetics

26) Which level of genetics examines how the forces of nature have influenced the spread of traits?
A) Population genetics
B) Transmission genetics
C) Molecular genetics

27) What is the difference between hypothesis testing and discovery-based research?
A) Hypotheses can be validated or invalidated while discovery-based research relies more on collection and analysis of data without a hypothesis.
B) Discovery-based science can be validated or invalidated while hypothesis-based research relies more on collection and analysis of data.
C) There is only one type of experimental approach, both terms describe the same approach.
D) Hypothesis-based research results in believable science while discovery-based research results in unreliable conclusions.

28) A scientist observes two populations of birds that differ slightly in their morphology. In order to explain these observations, which strategy should the scientist employ as a first step?
A) Propose a hypothesis
B) Relate structure and function
C) Analyze data
D) Use statistics

29) The cloned sheep Dolly was born to an ewe that had a black face yet Dolly had a white-face. What is the explanation for this?

A) Dolly was a mutant black-faced sheep and should have had a black face.
B) The ewe that gave birth to Dolly was a mutant white-faced sheep.
C) Dolly's genome was originally from an ewe that was a white-faced breed of sheep.
D) Dolly was the result of mating a white-faced ram and the black faced ewe when that occurs all the progeny will have a white-face.

30) Fish from lakes that are stained with the plant pigment tannin are more darkly colored than fish from lakes that have less tannin. If the offspring from the fish from a lake with high tannin levels are raised in a low tannin lake they turn out to be lightly pigmented. This would most likely be an example of_____.

A) the pigmentation only being controlled by genetic factors
B) the male fish only producing sperm that resulted in the lightly pigmented morph
C) the environment controlling the pigmentation of the fish
D) the female fish only producing eggs with the lightly pigmented gene

31) Mendel is frequently credited with the discovery of transmission genetics and his major contribution relied on the breeding of peas to see what types and ratios of different offspring the plants could produce.
This is an example of what kind of experiment?

A) Discovery-based
B) Hypothesis testing
C) A mixture of discovery-based and hypothesis testing
D) Neither discovery-based nor hypothesis testing

32) What would be the anticipated result if a gene produced less RNA for an essential enzyme?

A) There would be no change in the cell or the organism.
B) The cell or organism would die.
C) The cell or organism could experience difficulty possibly leading to death.
D) The cell or organism would not be any different than one that did not carry the mutation.

33) When rats are controlled by pesticides a specific allele for the oxygen-carrying protein hemoglobin becomes more prevalent in the population and rats carrying the allele are more resistant to the poison. However, this allele is also less efficient at carrying oxygen. When the pesticide is no longer used then the frequency of the mutant allele drops in the population and the more efficient oxygen-carrying allele increases. This can be considered an example of_____.

A) natural selection
B) gene regulation
C) DNA being the informational molecule

34) The blood types of the ABO typing system are inheritable even though they result from different forms of a carbohydrate on the cell surface. The explanation for why this in an inheritable trait is_____.

A) a protein controls the formation of the carbohydrate
B) this is an exception of DNA being the inheritable molecule
C) the carbohydrate is synthesized from the mRNA
D) the carbohydrate is synthesized directly from the DNA

35) A mutation in a codon will result in_____.

A) a new gene
B) a new allele
C) a new lipid
D) a new carbohydrate

36) If two separate species have genes with nearly identical DNA sequences it most likely means that_____.

A) they evolved from a common ancestor
B) they are really the same species and not two different species
C) they share no real relationship
D) the proteins that one of the genes makes is non-functional

37) Why would a mouse be more useful than a bacterium as a model organism?
A) Bacteria divide/replicate more slowly.
B) Mouse physiology is more closley related to humans.
C) Mice have simpler genetics and inheritance patterns.
D) Bacterial genes are more closely related to human genes.

38) A type of muscular dystrophy called Emery-Dreifuss muscular dystrophy can occur when the nesprin-2 protein contains the amino acid methionine at a certain location instead of the amino acid threonine.
Why does this change in amino acid placement likely occur?
A) There was a mutation in the gene for nesprin-2.
B) The gene was correct but was transcribed incorrectly.
C) The mRNA was correct but it was translated incorrectly.
D) The amino acids were sticky and the incorrect amino acid stuck to the completed protein.

39) Assuming this piece of DNA was transcribed and translated from start to finish, how many amino acids would it encode: ATGCCACGGAAACCCGGC?
A) 18
B) 9
C) 6
D) 3

40) An enzyme found in some viruses called reverse transcriptase can copy RNA into DNA. This enzyme performs the reverse function of which step of gene expression at the molecular level?
A) Transcription
B) Translation
C) DNA replication
D) Functioning of proteins in a cell

41) Cystic fibrosis occurs when there is a mutation in the gene for the cystic fibrosis transmembrane conductance regulator (CFTR). The production of sweat, digestive fluids, and mucus depends on a functional CFTR protein. When people have mutations in both *CFTR* genes, secretions become thick and cystic fibrosis occurs. The traits encoded by the *CFTR* gene are_____ traits.

A) morphological
B) physiological
C) behavioral

42) A person's deeply held feelings about whether they're a man, woman, both, or neither is their_____.

A) gender identity
B) gender
C) sex
D) sexual orientation

43) In genetics, an individual that has one or more uncommon characteristics is called_____.

A) abnormal
B) normal
C) wild-type
D) diseased

44) An individual that has the gender identity of a man and the assigned sex at birth which is not male is called a_____.

A) cis-man
B) trans-man
C) nonbinary person

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Answer Key

Test name: Chapter 01 Test Bank: Overview of Genetics

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

38) A
39) C
40) A
41) B
42) A
43) A
44) B