

Name: _____

Date: _____

1.

Scientists use artificial pollination to develop new kinds of flowers, fruits, and vegetables. This type of selective breeding produces new varieties called

- A. dicots.
 - B. hybrids.
 - C. predators.
 - D. monocots.
-

2. Genetics is the study of

- A. bacteria.
 - B. evolution.
 - C. heredity.
 - D. reproduction.
-

3. Cells secrete proteins, often as enzymes, that have been engineered or directed by the DNA in the nucleus. Which processes are involved in protein synthesis?

- A. transfer to RNA, then to amino acids
 - B. transcription into RNA, then translation into amino acids
 - C. replication of DNA, then transcription into enzymes
 - D. translation into RNA, then replication into DNA
-

4. Which shows the correct sequence of events in reproduction?

- A. gamete formation, zygote formation, fertilization
 - B. fertilization, gamete formation, zygote formation
 - C. gamete formation, fertilization, zygote formation
 - D. zygote formation, fertilization, gamete formation
-

5. Sexual reproduction results from the joining of two specialized sex cells called gametes. When a sperm and ovum combine to form a cell, what is this cell called?

- A. embryo
 - B. fetus
 - C. zygote
 - D. baby
-

6. During translation, the tRNA anti-codon GGA codes for what amino acid?

- A. alanine
 - B. tyrosine
 - C. proline
 - D. glutamic
-

Biology Standard 2 (BiologyStandard2)

7. Artificial selection is human intervention allowing only the **best** organisms to produce offspring. How is this process **most** useful to humanity?

- A. It allows the development of new species not dependent on the environment.
 - B. It allows geneticists to emphasize desirable traits in food, plants, and animals.
 - C. It prevents the development of new species.
 - D. It gives the existing species a better chance to reproduce in greater numbers.
-

8. If the sequence of nucleotides were AGC on a strand of DNA, what would be the nucleotide sequence on a strand of mRNA formed during transcription?

- A. ACG
 - B. UCG
 - C. TGC
 - D. TCG
-

9. The process of asexual reproduction forms offspring from

- A. a single organism.
 - B. the process of mating.
 - C. male and female parents.
 - D. the joining of two sets of chromosomes.
-

10. To maintain the number of chromosomes from parents to offspring during sexual reproduction, two steps are required. The first, meiosis, results in

- A. twice as many chromosomes as in the original cell.
 - B. rearranged chromosomes of the same size and number.
 - C. larger chromosomes than those in the original cell.
 - D. half the number of chromosomes as in the original cell.
-

11. The process of meiosis, which is a special kind of cell division, forms gametes for

- A. growth.
 - B. repair.
 - C. replacement.
 - D. reproduction.
-

12. Most animals reproduce sexually. The egg and sperm cells involved in sexual reproduction are formed by

- A. budding.
 - B. cloning.
 - C. meiosis.
 - D. regeneration.
-

13. Sperm resulting from meiosis have all these characteristics EXCEPT a

- A. tail-like structure for movement.
 - B. large supply of cytoplasm for food.
 - C. set of chromosomes for body traits.
 - D. size close to that of most other sperm.
-

Biology Standard 2 (BiologyStandard2)

14. After the production of sperm and egg cells during sexual reproduction, what happens at fertilization?

- A. Eggs and sperm are separated.
 - B. Four equal cells are produced.
 - C. The chromosome number is cut in half.
 - D. The original chromosome number is restored.
-

15. What happens during meiosis?

- A. The number of chromosomes increases from haploid to diploid.
 - B. The number of chromosomes decreases from diploid to haploid.
 - C. There is a segregation of dominant and recessive genes.
 - D. There is an integration of dominant and recessive genes.
-

16. Which is true of meiosis?

- A. Identical cells are produced.
 - B. Haploid cells are produced.
 - C. Fertilized cells are produced.
 - D. Somatic cells are produced.
-

17. Which is usually considered a disadvantage of asexual reproduction?

- A. It is a fast method of reproduction.
 - B. It produces a large number of offspring.
 - C. It requires two parents.
 - D. It produces identical offspring.
-

18. Half of Wendy's chromosomes came from her mother and half from her father. Few of her chromosomes are identical to those of either parent because most of the genes on them have been exchanged with genes on other chromosomes. What process accounts for this?

- A. independent assortment
 - B. crossing over
 - C. nondisjunction
 - D. segregation
-

19. Which is NOT true of meiosis?

- A. Both eggs and sperm cells have the same number of chromosomes.
 - B. Both eggs and sperm cells have one-half the parent cells' chromosome number.
 - C. It is a process producing gametes only.
 - D. It is the same process that occurs in body cell division.
-

20. An egg and a sperm cell each have 16 chromosomes. How many chromosomes will the new life form they produce have?

- A. 8
 - B. 16
 - C. 32
 - D. 64
-

21.

The function of mRNA is to

- A. carry genetic information from the nucleus to the site of protein synthesis.
 - B. begin the "unzipping" of the DNA molecule.
 - C. maintain homeostasis within the cell during mitosis.
 - D. direct the movement of centrosomes during meiosis.
-

22. During meiosis how many times is the DNA replicated?

- A. zero times
 - B. one time
 - C. two times
 - D. four times
-

23. What is (are) formed during replication?

- A. amino acids
 - B. DNA
 - C. protein
 - D. RNA
-

24. Hemophilia is more common in males than females because it is caused by a

- A. dominant gene found on the X chromosome.
 - B. dominant gene found on the Y chromosome.
 - C. recessive gene found on the X chromosome.
 - D. recessive gene found on the Y chromosome.
-

25. Which condition is caused by a chromosome going the wrong way during genetic formation producing a zygote with an extra chromosome?

- A. color blindness
 - B. Cooley's anemia
 - C. Down's syndrome
 - D. hemophilia
-

26. An ovum is a(n)

- A. egg.
 - B. embryo.
 - C. fetus.
 - D. spermatozoon.
-

27. The uniting of egg and sperm is

- A. fertilization.
 - B. germination.
 - C. mutation.
 - D. pollination.
-

28. Selecting plants or animals with the **most** desirable traits to be bred together is a common practice for things like race horses, high-yield corn, and mules. What is this kind of breeding called?

- A. cross breeding
 - B. mixed breeding
 - C. controlled breeding
 - D. random breeding
-

29. The mating of individuals with similar genetics can help keep a pure line. With plants this can be done by self-pollination but with animals, brothers and sisters may be mated over several generations. What do we call this breeding practice?

- A. inbreeding
 - B. hybridization
 - C. cloning
 - D. compilation
-

30. As each section of the genetic code on DNA is transcribed to mRNA, the two strands of DNA rejoin. Then the mRNA moves into the cytoplasm through a pore in the nuclear membrane. Ribosomes attach to the mRNA, in the cytoplasm, to carry out the formation of a protein. What is this process called?

- A. mutation
 - B. synthesis
 - C. translation
 - D. transference
-

31. Which **best** shows the proper code-structure sequence in protein synthesis?

- A. DNA, mRNA, mRNA, polypeptide, enzyme
 - B. DNA, mRNA, tRNA, polypeptide, enzyme
 - C. enzyme, polypeptide, mRNA, mRNA, DNA
 - D. mRNA, DNA, mRNA, enzyme, polypeptide
-

32. Proteins are built up or synthesized by the code stored in the DNA molecules. Which concept about protein synthesis in an organism is NOT correct?

- A. The DNA code of nitrogen bases is the same as the protein code.
 - B. RNA is a chemical that acts as a messenger for DNA.
 - C. The ribosomes are the parts of cells where proteins are manufactured.
 - D. The sequence of DNA bases determines the arrangement of amino acids in a protein.
-

33. An individual's sex is determined by his or her sex chromosomes. Which is NOT correct?

- A. Sperm carry only the Y chromosome.
- B. A zygote with chromosomes XY is male.
- C. A zygote with chromosomes XX is female.
- D. The sex of the zygote is determined by the sperm.

34. Which does NOT contain gametes?

- A. chromatid
 - B. gonad
 - C. ovary
 - D. pollen
-

35. Which describes a current use of genetic engineering?

- A. identifying hereditary diseases
 - B. vaccinating a child for measles
 - C. making human insulin using bacteria
 - D. treating cancer with radiation therapy
-

36. Which process forms sperm and egg cells?

- A. artificial selection
 - B. meiosis
 - C. replication
 - D. spore formation
-

37. Which process reduces the number of chromosomes in a cell?

- A. binary fission
 - B. crossing over
 - C. meiosis
 - D. mitosis
-

38. Why is meiosis important?

- A. The process allows an organism to reproduce asexually.
 - B. The process produces two cells identical to the parent cell.
 - C. The process produces cells with half the normal number of chromosomes.
 - D. The process causes a fertilized egg to multiply and develop into an embryo.
-

39. Which explains how the advantage of genetic variation through sexual reproduction occurs?

- A. One of each pair of chromosomes comes from each parent.
 - B. The union of sperm and egg occurs during meiosis.
 - C. Meiosis occurs in all body cells also.
 - D. Division of body cells results in a greater variety of traits.
-

40. Which characteristic is the same in both sperm and egg cells?

- A. motility
 - B. cell size
 - C. number of chromosomes
 - D. number of viable cells produced during gametogenesis
-

Biology Standard 2 (BiologyStandard2)

41. Which are differences between egg and sperm cells? I. size of cell II. shape of cell III. number of chromosomes per cell

- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II, and III
-

42.

In which way is meiosis different from mitosis?

- A. Meiosis produces cells without nuclei.
 - B. Meiosis produces egg and sperm cells.
 - C. Chromosomes divide during mitosis but not during meiosis.
 - D. Mitosis results in cells with one half the number of chromosomes.
-

43.

If skin and muscle cells in humans have 46 chromosomes, how many chromosomes will be present in a typical egg cell?

- A. 23
 - B. 46
 - C. 92
 - D. 115
-

44.

Which of the following events takes place before mitosis and before meiosis in reproductive organs?

- A. nuclear division
 - B. DNA replication
 - C. RNA redistribution
 - D. cell membrane pinching
-

45. Which of the following would be an important advantage of sexual reproduction over asexual reproduction?

- A. more variation among offspring
 - B. the production of more offspring
 - C. the quicker development of offspring
 - D. the protection of the offspring by the parent
-

46. In living things, whether plant or animal, the carrier of hereditary instructions is

- A. DNA.
 - B. genetic vacuole.
 - C. messenger RNA.
 - D. mitochondria in animals, chloroplasts in plants.
-

Biology Standard 2 (BiologyStandard2)

47. One early spring morning, Reva went to her car to go to school. She noticed that the entire car was covered with a thin layer of yellow-green pollen. Each pollen grain was created by what type of cell division?

- A. meiosis
 - B. mitosis
 - C. budding
 - D. nuclear fission
-

48.

An organism that is capable of passing on a trait for a specific disease to its offspring, but which does NOT express the disease itself, is described as which of the following?

- A. a carrier
 - B. a homozygote
 - C. a mutant
 - D. a purebred
-

49.

A normal cell formed by fertilization, containing two copies of each chromosome, one from the mother and one from the father, is

- A. diploid.
 - B. haploid.
 - C. a gamete.
 - D. an allele.
-

50.

An example of nondisjunction would be

- A. unsuccessful DNA cloning of a single-celled organism.
 - B. a spontaneous mutation occurring naturally in an organism.
 - C. an abnormality in the number of chromosomes within an organism.
 - D. the manipulation of DNA segments and chromosomes within microorganisms.
-

51. The gene for red/green colorblindness in humans is recessive and primarily affects males. It must be located on

- A. the X chromosome
 - B. the Y chromosome
 - C. both the X and Y chromosomes
 - D. either the X or Y chromosome
-

52. A gene that is sex-linked is BEST described as which of the following?

- A. It results in all male offspring.
 - B. It results in all female offspring.
 - C. It is located on the X chromosome.
 - D. It is located inside the mitochondria.
-

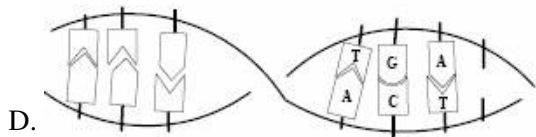
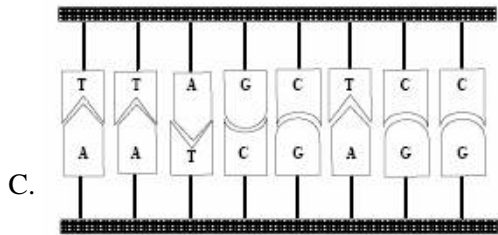
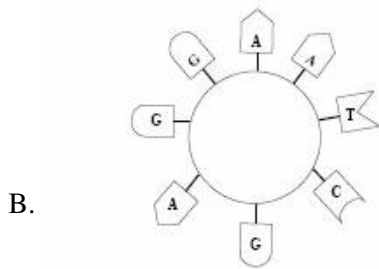
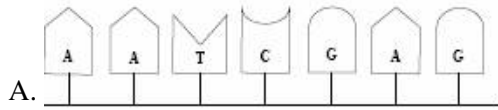
53. Athletes are often concerned with the question of how much protein they need in their diets because of the requirement of growing muscles for protein. Just as muscles need the basic building block of protein, protein itself has basic building blocks also. Which of the following are the basic building blocks of protein?

- A. nitrates
 - B. amino acids
 - C. monosaccharides
 - D. nucleotides
-

54. The process by which the order of bases in messenger RNA (mRNA) codes for the order of amino acids in a protein is called

- A. translation
 - B. transcription
 - C. replication
 - D. nondisjunction
-

55. Which of the following correctly shows the shape of a DNA molecule?



56. The genetic disorder trisomy 21 (Down syndrome) is caused by what genetic event?

- A. crossing-over
 - B. nondisjunction
 - C. base pair substitution
 - D. frame-shift location
-

57. Which of the following shows how information is transformed to make a protein?

- A. DNA → RNA → protein
 - B. gene → chromosome → protein
 - C. cell respiration → ATP → protein
 - D. ATP → amino acid → protein
-

58. The observed trait that appears in an organism as a result of its genetic makeup is called the organism's

- A. allele
 - B. genotype
 - C. phenotype
 - D. karyotype
-

59. Why is the particular sequence of bases in a segment of DNA important to cells?

- A. Some base sequences code for protein production.
- B. Some base sequences cause the release of lipids from the nucleus.
- C. Some base sequences contain the order of sugars in polysaccharides.
- D. Some base sequences produce electrical signals sent to the cytoplasm.

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Biology Standard 2 (BiologyStandard2)

60. Within an individual mouse, four different mutations occurred in different genes, located on separate chromosomes and in different cells, as shown in the table below.

| Cell Type | Chromosome | Trait | Normal Phenotype | Mutated Phenotype |
|-----------|--------------|---------------|------------------|-------------------|
| skin | chromosome 4 | fur color | black fur | white fur |
| gamete | chromosome 3 | eye color | brown eyes | blue eyes |
| muscle | chromosome 2 | fur thickness | thick fur | thin fur |
| nerve | chromosome 1 | tail length | long tail | short tail |

Which of these mutations could be passed on to the mouse's offspring?

- A. white fur
- B. blue eyes
- C. thin fur
- D. short tail

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61. A rare genetic condition causes dwarfism and immunodeficiencies. Which of the following is the **most likely** cause of this condition?

- A. a parasitic infection
- B. a mutation in DNA
- C. a bacterial disease
- D. an excess of ATP

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62. Two spotted leopards produce a litter of four cubs. Three of the cubs are spotted and one is solid black. The black coat is **probably** what type of trait?

- A. dominant
- B. recessive
- C. polygenic
- D. sex-linked

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63.

Which statement correctly describes the difference between DNA and RNA?

- A. RNA contains the base thymine, while DNA contains the base uracil.
 - B. DNA contains the sugar ribose, while RNA has the sugar deoxyribose.
 - C. RNA is shaped like a single chain, while DNA is shaped like a double-helix.
 - D. RNA is always found inside the nucleus of a cell, while DNA is often found outside of the nucleus of a cell.
-

64.

Which statement BEST describes the role that DNA plays in storing and transmitting cellular information?

- A. DNA acts as a molecular blueprint for proteins, storing information in the nucleus.
 - B. DNA carries amino acids to the ribosome in the construction of proteins.
 - C. DNA acts as a message that tells ribosomes what proteins to make.
 - D. DNA travels from cell to cell carrying messages.
-

65.

Determining the paternity of a child
Helping doctors diagnose specific diseases
Identifying criminal suspects

All of these are functions of

- A. electron microscopes.
 - B. DNA fingerprinting.
 - C. genetic engineering.
 - D. nuclear medicine.
-

66.

What type of reproductive strategy would BEST allow an organism to rapidly produce many clones of itself in order to quickly populate an ecosystem?

- A. alternation of generations
 - B. asexual reproduction
 - C. diploid sexual reproduction
 - D. haploid sexual reproduction
-

67.

A certain gene for albinism occurs in alligators. When the defective gene is present, the alligator's skin is white and the animal has blue eyes. The DNA gene sequences for the normal coloration gene and for the albino gene are shown.

Normal: AAC CAC GGT AGC CCC

Albino: AAC CAA GGT AGC CCC

What type of DNA point mutation leads to albino alligators?

- A. deletion
 - B. duplication
 - C. insertion
 - D. substitution
-

68.

While walking in his rose garden, Farmer Brown notices that he has created the world's first blue rose. What is the most likely reason that the blue color developed?

- A. exposure to x-rays
 - B. exposure to mutagenic chemicals
 - C. the natural alteration of the color gene during mitosis
 - D. the natural alteration of the color gene during meiosis
-

69.

What type of information-coding biomolecule NEVER has uracil in its sequence?

- A. DNA
 - B. messenger RNA
 - C. ribosomal RNA
 - D. transfer RNA
-

70.

Suppose that a man has brown eyes. His genotype is Bb. He got the B gene from his mother and the b gene from his father. How many types of reproductive cells can he produce by meiosis, with regard to eye color?

- A. one
 - B. two
 - C. four
 - D. an unlimited number
-

71.

What is a major disadvantage to asexual reproduction?

- A. It involves a high-degree of competition between related organisms.
 - B. It produces little or no genetic variability in the offspring.
 - C. It only requires one parent.
 - D. It is time-consuming.
-

72.

A certain sequence of DNA codons is shown.

AAC CAT CGG

How would these codons be different if this were a messenger RNA transcript of the same sequence?

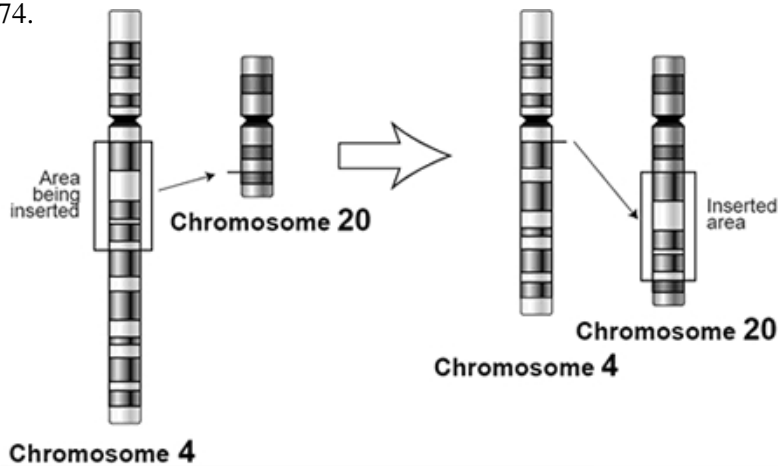
- A. There would be no difference between the two sets of codons.
 - B. The codons would be complementary resulting in TTG GTA GCC.
 - C. The codons would be the same, but T would change to U, resulting in AAC CAU CGG.
 - D. The codons would be complementary and T would be changed to U, resulting in UUG GUA GCC.
-

73.

What is the primary reason that DNA is stored in the nucleus of a cell for the purposes of information transfer?

- A. When the DNA is in one central location, ribosomes can migrate to the nucleus to read the code and make their proteins.
 - B. DNA is in the nucleus because the nucleus also stores amino acids to make the proteins in the directions.
 - C. The chromosomes where the DNA code is stored are much too large to be read by individual ribosomes, so many RNA messages are sent from the nucleus.
 - D. The DNA is housed in the nucleus because the nucleus is passed on to daughter cells in one intact package, when cells divide.
-

74.



The picture shows an insertion mutation, where a piece of chromosome 4 is mistakenly inserted into chromosome 20. In what situation is this type of mutation the MOST likely to happen?

- A. when DNA is exposed to harmful ultraviolet rays
 - B. when DNA is exposed to harmful chemicals that cause mutations
 - C. when DNA replicates during the formation of sex cells in meiosis
 - D. when DNA replicates during the formation of regular body cells during mitosis
-

75.

Suppose that a gene for growth hormone is discovered in cats. If a drug company wanted to mass-produce the hormone by cloning the gene into bacteria, what would it need to do?

- A. place the cat gene into a plasmid and place the plasmid into bacteria
 - B. make a DNA fingerprint of the cat gene and insert it into bacteria
 - C. change the sequence of the bacteria's DNA so that it makes the cat hormone
 - D. remove the nucleus of a cat cell and place it into bacteria
-

76.

A certain woman is a heterozygote for hitchhiker's thumb and she is also a heterozygote for freckles. Her genotype is HhFf. For these genes, how many different types of reproductive cells can meiosis create?

- A. one
 - B. two
 - C. three
 - D. four
-

77.

What type of reproduction would be BEST for a population of plants that is susceptible to a deadly fungus disease?

- A. binary fission
 - B. budding
 - C. fragmentation
 - D. sexual reproduction
-

78.

One of the fundamental laws that Mendel discovered while working with sweet pea plants was the law of independent assortment. What does this law state?

- A. Pairs of alleles for the same trait separate from each other during meiosis.
 - B. Different genes separate during meiosis, independently of each other.
 - C. A Punnett square has a fixed ratio of percentages in the offspring.
 - D. When a dominant gene and a recessive gene are present, the dominant gene will appear in the phenotype.
-

79.

A type blood-clotting disorder, known as Factor V deficiency, results when a single DNA base is deleted from the gene for the protein. The correct sequence for this gene appears as this:

AAC TAT TTG TAG CAT CCG GAG

Based on this correct sequence, which defective DNA sequence would result in Factor V deficiency?

Defective I: AAC TAT TTG GTA GCA TCC GGA G

Defective II: AAC TTT TTG TAG CAT CCG GAG

Defective III: AAC ATT TGT AGC ATC CGG AG

Defective IV: AAC TAT TTG TTG TAG CAT CCG GAG

- A. Defective Sequence I
 - B. Defective Sequence II
 - C. Defective Sequence III
 - D. Defective Sequence IV
-

80.

A police detective finds a speck of blood at a crime scene. He knows that there is not enough DNA in the sample for the crime lab to use directly. What is likely the first step that the crime lab will take, in order to have enough DNA to work with?

- A. clone the DNA sample in bacteria
 - B. do a DNA fingerprint directly on the sample
 - C. use the polymerase chain reaction on the sample
 - D. use restriction enzymes to digest the sample into smaller pieces
-

81.

Human insulin protein contains 51 amino acids. Recall that a codon is a small stretch of DNA bases that codes for one amino acid in a protein. How many DNA bases would be needed, among all the codons in the gene, to carry the information code for the human insulin protein?

- A. 17
 - B. 51
 - C. 64
 - D. 153
-

82.

In parakeets, the gene for green feathers is dominant to the gene for yellow feathers. Knowing that meiosis produces an assortment of alleles, suppose that a green male parakeet mates with a female yellow parakeet. The male's genotype is Gg, while the female parakeet's genotype is gg. What percentage of the offspring will have yellow feathers?

- A. 0%
- B. 25%
- C. 50%
- D. 75%

83.

In fruit flies, white eyes are a sex-linked recessive trait. Suppose that a red-eyed female with genotype $X^R X^r$ mates with a male with genotype $X^R Y$. Describe the females from this cross.

- A. 100% will be red-eyed non-carriers
 - B. 50% will be red-eyed; 50% will be white-eyed
 - C. 50% will be red-eyed purebred; 50% will be red-eyed carriers of the white eye gene
 - D. 25% will be red-eyed purebred; 50% will be red-eyed carriers of the white eye gene; and 25% will be white-eyed
-

84.

Which type of information-coding molecule fits the correct description?

- A. DNA is clover-leaf shaped and carries amino acids to the ribosome for protein production.
 - B. Messenger RNA is single-stranded, and serves as a copy of the DNA code for the ribosome.
 - C. Transfer RNA is part of the structure of the ribosome that makes proteins.
 - D. Proteins serve as the genetic code to build new DNA molecules.
-

85.

Put the listed events into the correct sequence.

- I: Transfer RNA carries amino acids to the ribosome.
- II: Double-stranded DNA serves as a genetic blueprint.
- III: Messenger RNA travels to the ribosome.
- IV: Proteins are produced by the ribosome in translation.
- V: Transcription creates a messenger RNA copy of a gene in the DNA.

- A. II, I, V, III, IV
 - B. IV, II, V, III, I
 - C. II, V, III, I, IV
 - D. I, IV, II, V, III
-

86.

Exposure to UV light in tanning beds or on the beach causes sunburn. At the level of the cell, the UV light destroys DNA. This DNA must then be repaired by DNA polymerase enzymes that are also used in DNA replication. What type of genetic defect is most likely to appear in a cell because of a sunburn?

- A. the inability to divide again
 - B. a substitution error in a DNA base
 - C. the appearance of an extra chromosome
 - D. the insertion of a piece of one chromosome into another
-

DNA Base Sequence Comparison

| | |
|------------|-----------------------------|
| Human | AGG CAT AAA CCA ACC GAT TAA |
| Chimpanzee | AGG CCC CTT CCA ACC GAT TAA |
| Gorilla | AGG CCC CTT CCA ACC AGG CCA |

87.

This chart compares the base sequences of homologous segments of DNA from three primates. Based on this information, how many differences in the resulting amino acid sequences would you expect to find between humans and chimpanzees?

- A. 2
- B. 3
- C. 4
- D. 6

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88. After a culture of cells is allowed to multiply and is viewed through a microscope, the cells are x-rayed with high-energy radiation for less than 1/100th of a second. After the radiation, many newly reproduced cells appear different. What has probably occurred?

- A. Contamination
- B. Mutation
- C. Bacterial infection
- D. Speciation

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89. One strand of DNA could be as long as a football field if it were stretched out lengthwise. One of the factors allowing DNA to fit inside the nucleus of a cell is its ability to —

- A. break apart into separate genes
- B. extend to form very long, thin molecules
- C. coil tightly around associated proteins
- D. denature from the effect of an enzyme

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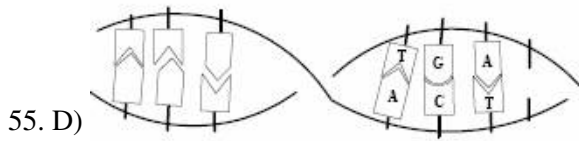
Answer Key

1. B) hybrids.
2. C) heredity.
3. B) transcription into RNA, then translation into amino acids
4. C) gamete formation, fertilization, zygote formation
5. C) zygote
6. C) proline
7. B) It allows geneticists to emphasize desirable traits in food, plants, and animals.
8. B) UCG
9. A) a single organism.
10. D) half the number of chromosomes as in the original cell.
11. D) reproduction.
12. C) meiosis.
13. B) large supply of cytoplasm for food.
14. D) The original chromosome number is restored.
15. B) The number of chromosomes decreases from diploid to haploid.
16. B) Haploid cells are produced.
17. D) It produces identical offspring.
18. B) crossing over
19. D) It is the same process that occurs in body cell division.
20. C) 32
21. A) carry genetic information from the nucleus to the site of protein synthesis.
22. B) one time
23. B) DNA
24. C) recessive gene found on the X chromosome.
25. C) Down's syndrome
26. A) egg.

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- 27. A) fertilization.
- 28. C) controlled breeding
- 29. A) inbreeding
- 30. C) translation
- 31. B) DNA, mRNA, tRNA, polypeptide, enzyme
- 32. A) The DNA code of nitrogen bases is the same as the protein code.
- 33. A) Sperm carry only the Y chromosome.
- 34. A) chromatid
- 35. C) making human insulin using bacteria
- 36. B) meiosis
- 37. C) meiosis
- 38. C) The process produces cells with half the normal number of chromosomes.
- 39. A) One of each pair of chromosomes comes from each parent.
- 40. C) number of chromosomes
- 41. A) I and II only
- 42. B) Meiosis produces egg and sperm cells.
- 43. A) 23
- 44. B) DNA replication
- 45. A) more variation among offspring
- 46. A) DNA.
- 47. A) meiosis
- 48. A) a carrier
- 49. A) diploid.
- 50. C) an abnormality in the number of chromosomes within an organism.
- 51. A) the X chromosome
- 52. C) It is located on the X chromosome.
- 53. B) amino acids

54. A) translation



56. B) nondisjunction

57. A) DNA → RNA → protein

58. C) phenotype

59. A) Some base sequences code for protein production.

60. B) blue eyes

61. B) a mutation in DNA

62. B) recessive

63. C) RNA is shaped like a single chain, while DNA is shaped like a double-helix.

64. A) DNA acts as a molecular blueprint for proteins, storing information in the nucleus.

65. B) DNA fingerprinting.

66. B) asexual reproduction

67. D) substitution

68. D) the natural alteration of the color gene during meiosis

69. A) DNA

70. B) two

71. B) It produces little or no genetic variability in the offspring.

72. D) The codons would be complementary and T would be changed to U, resulting in UUG GUA GCC.

73. C) The chromosomes where the DNA code is stored are much too large to be read by individual ribosomes, so

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many RNA messages are sent from the nucleus.

- 74. C) when DNA replicates during the formation of sex cells in meiosis
- 75. A) place the cat gene into a plasmid and place the plasmid into bacteria
- 76. D) four
- 77. D) sexual reproduction
- 78. B) Different genes separate during meiosis, independently of each other.
- 79. C) Defective Sequence III
- 80. C) use the polymerase chain reaction on the sample
- 81. D) 153
- 82. C) 50%
- 83. C) 50% will be red-eyed purebred; 50% will be red-eyed carriers of the white eye gene
- 84. B) Messenger RNA is single-stranded, and serves as a copy of the DNA code for the ribosome.
- 85. C) II, V, III, I, IV
- 86. B) a substitution error in a DNA base
- 87. A) 2
- 88. B) Mutation
- 89. C) coil tightly around associated proteins