Genetics (ScienceGHSGT2)

Name:_____ Date:_____

1. 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

2. 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

3. 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

4. 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

5. The uniting of egg and sperm is

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

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

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

7.

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.

8. Which is in the shape of a double helix?

A. amino acid
B. deoxyribonucleic acid
C. enzyme
D. protein

9. 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.

10. Which process forms sperm and egg cells?

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

11.

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

12. 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

13.

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.

14.

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.

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15. 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

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16. 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.

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

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

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18. 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

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19. 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

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20. 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.

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21. 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.

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22. 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.

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23. 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.

24.

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.

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25. Genetics is the study of

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

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26. 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

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27. 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

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28. 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

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29. 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.

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30. All chromosomes are composed of

A. DNA and lipids.
B. DNA and protein.
C. RNA and lipids.
D. RNA and protein.

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31. Which does NOT contain gametes?

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

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32. 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.

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33. 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

34.

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.

35.

Which of the following DNA base pairs are correct?

A. A-A
C-C
A-T
B. T-A
A-T
C. G-A
A-T
D. T-G

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36. 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.

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37. Messenger RNA carries genetic information in groups of three bases known as

A. amino acids.
B. codons.
C. enzymes.
D. helixes.

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38. 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.

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

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

40.

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

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41. 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.

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42. 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

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43. 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.

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

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

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45. 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

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46. 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

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47. 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.

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48. 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

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49. What is (are) formed during replication?

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

50.

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

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51. 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.

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

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

Answer Key

1. A) inbreeding

2. C) controlled breeding

3. C) making human insulin using bacteria

4. B) DNA, mRNA, tRNA, polypeptide, enzyme

5. A) fertilization.

6. B) one time

7. A) carry genetic information from the nucleus to the site of protein synthesis.

8. B) deoxyribonucleic acid

9. C) recessive gene found on the X chromosome.

10. B) meiosis

11. A) a carrier

12. A) meiosis

13. C) an abnormality in the number of chromosomes within an organism.

14. A) diploid.

15. A) more variation among offspring

16. C) The process produces cells with half the normal number of chromosomes.

17. C) meiosis

18. A) I and II only

19. C) number of chromosomes

20. D) half the number of chromosomes as in the original cell.

21. A) a single organism.

22. B) Haploid cells are produced.

23. D) The original chromosome number is restored.

24. B) hybrids.

25. C) heredity.

26. C) 32

27. C) gamete formation, fertilization, zygote formation

28. C) zygote

29. D) It produces identical offspring.

30. B) DNA and protein.

31. A) chromatid

32. B) It allows geneticists to emphasize desirable traits in food, plants, and animals.

33. B) crossing over

34. B) Meiosis produces egg and sperm cells.

35. B)

36. A) One of each pair of chromosomes comes from each parent.

37. B) codons.

38. A) DNA.

39. C) meiosis.

40. A) 23

41. B) The number of chromosomes decreases from diploid to haploid.

42. B) UCG

43. A) The DNA code of nitrogen bases is the same as the protein code.

44. C) proline

45. B) transcription into RNA, then translation into amino acids

46. C) translation

47. D) It is the same process that occurs in body cell division.

48. C) Down's syndrome

49. B) DNA

50. B) DNA replication

51. A) Sperm carry only the Y chromosome.

52. D) reproduction.