

Directions: Read each question carefully and completely. Select the **ONE BEST** answer and record your choice by **CAREFULLY** blackening the proper space on your answer sheet with a #2 pencil. If you make a mistake, erase your old answer completely.

- Human males are the ----- sex
 A. homogametic B. heterogametic C. hemizygous D. hetrogenous
- Linked genes are
 A. joined by a centromere B. found on the same chromosome
 C. found only on sex chromosomes D. found in the same nucleus
- In mammals, gender is determined by
 A. X-chromosome - autosome balance B. dosage compensation
 C. Y-chromosome determination D. environmental dependence
- Male fruit flies have ---- Y - chromosomes
 A. no B. 1 C. 2 D. 3 E. 4
- How many Barr bodies would you expect to find in humans with the abnormal composition of sex chromosome X^0 (a person with a single X-chromosome)?
 A. zero B. one C. two D. three E. four
- A black female cat ($X^B X^B$) and an orange male cat ($X^0 Y$) were mated to each other and produced a male cat that was calico. Which sex chromosome did this male offspring inherit from its mother and father? Remember that the presence of the Y-chromosome determines maleness in mammals.
 A. the offspring inherited X^B from its mother and X^0 and Y from its father
 B. the offspring inherited X^B from its mother and Y from its father
 C. the offspring inherited X^B from its mother and X^0 from its father
- The gametes produced by human females may contain
 A. a single X-chromosome B. a single Y-chromosome C. two Y-chromosomes
- The gametes produced by a male fruit fly may contain
 A. a single X-chromosome B. a single Y-chromosome
 C. an X and Y chromosome D. both A and B E. all of the above
- In humans, the gene responsible for the development of testes is
 A. XXY B. SRY C. Xist D. SXT E. UAS
- An individual with an X^0 genotype for the sex chromosome would be phenotypically
 A. male B. female C. both male and female D. none
- Turner syndrome individuals are aneuploid because they

- A. lack an X-chromosome B. have an extra X-chromosome
 C. have an additional full set of chromosome
 D. have an extra copy of chromosome 22
12. Suppose that a mutation occurred in the SRY gene on the human Y chromosome, knocking out its ability to produce the testes-determining factor. Predict the phenotype of an individual who carried this mutation and a normal X-chromosome.
 A. female B. male C. sterile D. hard to predict
13. Individuals with Klinefelter syndrome are aneuploid because they
 A. lack an X- chromosome B. lack a Y-chromosome
 C. have an extra X-chromosome D. have an extra Y-chromosome
14. Individuals with the genotype XXY are phenotypically
 A. female B. male C. both male and female D. either male or female
15. An individual with the genotype XXXY would be phenotypically
 A. male B. female C. both male and female D. either male or female
16. A Barr body is an
 A. active X-chromosome B. inactivated Y-chromosome
 C. inactivated X-chromosome D. active Y-chromosome
17. Cells obtained from a normal woman would be observed to contain ----- Barr bodies
 A. zero B. 1 C. 2 D. 3 E. 4
18. A woman who is heterozygous for the color blindness alleles marries a color - blind man. What proportion of their sons will be color - blind?
 A. 0% B. 25% C. 50% D. 75% E. 100%
19. Which of the following is an example of a genetic mosaic?
 A. Calico coat color in cats B. albinism in humans
 C. anhidrotic ectodermal dysplasia in humans D. both A and C
20. The somatic cells of an individual with Klinefelter syndrome will contain ---- Barr bodies.
 A. zero B. 1 C. 2 D. 3 E. 4
21. A fruit fly with the genotype XXY would be phenotypically
 A. male B. female C. both male and female D. either male or female
22. A fruit fly with the genotype X0 would be phenotypically
 A. male B. female C. both male and female D. either male or female
23. For X-linked recessive genes
 A. more females than males exhibit the trait

- B. all of the sons of a homozygous mother will exhibit the trait
 C. all of the daughters of a homozygous mother will exhibit the trait
 D. all of the sons of a heterozygous mother will exhibit the trait
24. A male embryo with a mutation in the SRY gene would
 A. develop normally B. develop as a female C. not develop testes
 D. both B and C E. all of the above
25. In Griffith's transformation experiments, the mice died when they were injected with
 A. living, non-virulent bacteria B. living, virulent bacteria
 C. heat killed, non-virulent bacteria D. living, non-virulent bacteria mixed with
 heat killed, virulent bacteria E. both B and D
26. To show that DNA was the genetic material, Hershey and Chase performed experiments with which test organism?
 A. E. coli B. bacteriophage T2 C. drosophila D. bacteriophage lambda
27. In the semiconservative model of DNA replication, progeny double helices consists of
 A. one parental DNA strand and one new strand
 B. two new DNA strands C. two parental DNA strands
 D. one parental DNA strand and one RNA strand E. two new RNA strands
28. In the bacterium E. coli DNA replication is
 A. unidirectional and dispersive B. bidirectional and semiconservative
 C. unidirectional and semiconservative D. dispersive and semiconservative
29. Which of the following enzymes plays an important role in DNA replication?
 A. DNA polymerase III B. DNA helicase C. DNA ligase
 D. DNA primase E. all of the above
30. In eukaryotes, DNA replication
 A. is initiated at several sites on chromosomes B. occurs bidirectionally
 C. is semidiscontinuous D. all of the above E. none of the above
31. Telomerase is composed of
 A. protein only B. protein and RNA C. protein and DNA
 D. RNA and DNA E. protein and lipid
32. For transcription to occur correctly, a prokaryotic gene must have
 — A. a promoter B. an RNA coding sequence C. a terminator
 D. all of the above E. none of the above
33. Introns are removed from precursor mRNAs by
 A. ribosomes B. nucleosomes C. spliceosomes D. all of the above

34. The wobble hypothesis refers to the nucleotide located at the
 A. 5'-end of a codon B. 3'-end of a codon C. 3'-end of an anticodon
 D. either end of a codon E. second position in a codon
35. The genetic code is termed degenerate, which refers to the fact that
 A. there may be more than one codon for an amino acid
 B. the third nucleotide in a codon is allowed wobble
 C. there may be more than one amino acid for a codon
 D. there are more combinations of nucleotides in codons than there are amino acids
36. The synthesis of a protein is completed when ribosomes encounter
 A. the end of the gene B. the end of the mRNA transcript
 C. an AUG codon D. a UGA codon
37. Peptidyl transferase activity is closely associated with which ribosomal molecule?
 A. 5S rRNA B. 23S rRNA C. EF-Tu D. peptidyl t-RNA
38. A normal chromosome has the following sequence of genes along its length (where
 "*" represents the centromere)
 G E N E T * I C S
 If a deletion occurred in the chromosome, the sequence of genes might be
 A. G E N E T * C S B. G E N E N E N E T * I C S
 C. G E N P R Q E T * I C S D. G E N E T * S C I
39. A (n) ----- inversion involves the centromere.
 A. pericentric B. concentric C. paracentric D. epicentric
40. The type of mutation that results when a chromosome segment moves to a different
 location on the same chromosome is referred to as an
 A. interchromosomal inversion B. intrachromosomal duplication
 C. interchromosomal transversion D. intrachromosomal translocation
41. In a nonreciprocal translocation, a segment of a chromosome is
 A. transferred to a different chromosome without a reciprocal exchange of a genetic
 material
 B. transferred to a new location on the same chromosome without a reciprocal
 exchange of a genetic material
 C. exchanged with an identical segment on a different chromosome
 D. exchanged with an identical segment on a sister chromatid
42. In which condition is the X-chromosome prone to breakage in particular sites?
 A. Prader-Willi syndrome B. fragile X syndrome C. Turner syndrome
 D. Cri-du-chat syndrome
43. Gametes containing an abnormal number of chromosomes may occur as a result of
 A. nondisjunction of chromosomes B. unequal crossing over

C. reciprocal translocation

D. paracentric inversion

44. A monosomic human cell would contain

A. 46 chromosomes

B. 23 chromosomes

C. 45 chromosomes

45. A trisomic human cell would contain how many chromosomes?

A. 45

B. 46

C. 47

D. 48

E. 49

46. The condition resulting from a trisomy of chromosome 21 is

A. Down syndrome

B. Turner syndrome

C. Reye syndrome

D. Klinefelter syndrome

47. A polyploid cell in which all of the sets of chromosomes come from parents that are of the same species is a (n)

A. allopolyploid

B. autopolyploid

C. triplopolyploid

D. aneupolyploid

48. A cell that is tetraploid contains four

A. chromosomes

B. nuclei

C. copies of each chromosome

D. pairs of chromosomes

49. Cri-du-chat syndrome is caused by which type of chromosomal mutation?

A. deletion

B. duplication

C. inversion

D. translocation

50. Trisomy 13 produces

A. Down syndrome

B. Klinefelter syndrome

C. Turner syndrome

D. Patau syndrome

E. Edwards syndrome