CELL

1.) What is the relationship among DNA, a gene, and a chromosome?
A) A chromosome contains hundreds of genes, which are composed of DNA.
B) A chromosome contains hundreds of genes, which are composed of protein.
C) A gene contains hundreds of chromosomes, which are composed of protein.
D) A gene is composed of DNA, but there is no relationship to a chromosome.

2.) The "one gene – one polypeptide" theory states that
A) the synthesis of each gene is catalyzed by one specific enzyme.
B) the synthesis of each enzyme is catalyzed by one specific gene.
C) the function of an individual gene is to dictate the production of a specific polypeptide.
D) each polypeptide catalyzes a specific reaction.

3.) Any change in the nucleotide sequence of the DNA of a gene is called
A) a mutation.
B) an advantage.
C) a codon.
D) an anticodon.

4.) A base substitution mutation in a gene sometimes has no effect on the protein the gene codes for. Which of the following factors could account for this?
A) the rarity of such mutations
B) some amino acids have more than one codon
C) a correcting mechanism that is part of the mRNA molecule
D) A and B

5.) In humans, each cell normally contains _____ of chromosomes.

a. 11 pairs
b. 23 pairs
c. 32 pairs
d. 46 pairs

6.) How do the daughter cells at the end of mitosis and cytokinesis compare with their parent cell when it was in G1 of the cell cycle?
A) The daughter cells will have half the amount of cytoplasm and half the amount of DNA.
B) The daughter cells will have half the number of chromosomes and half the amount of DNA.
C) The daughter cells will have the same number of chromosomes and half the amount of DNA.
D) The daughter cells will have the same number of chromosomes and the same amount of DNA.

7.) Cytokinesis usually, but not always, follows mitosis. If cells undergo mitosis and not cytokinesis, this would result in
A) a cell with a single large nucleus
B) a cell with two nuclei.
C) cells with abnormally small nuclei
D) feedback responses that prevent mitosis

8.) It is difficult to observe individual chromosomes with a light microscope during prophase because
A) the DNA has not been replicated yet.
B) they are uncoiled in long, thin strands.
C) they leave the nucleus and are dispersed to other parts of the cell.
D) sister chromatids do not pair up until division starts.

9.) The word homologous literally means same location. How does this relate to homologous chromosomes?
A) All of the below are correct.
B) The bands resulting from staining are found in the same location.
C) The chromosomes have the same genes in the same location.
D) Both B and C are correct.

10.) In a given organism, how do cells at completion of meiosis compare with cells that are just about to begin meiosis?
A) They have half the number of chromosomes and one-fourth the amount of DNA.
B) They have half the amount of cytoplasm and twice the amount of DNA.
C) They have twice the amount of cytoplasm and half the amount of DNA.
D) They have the same number of chromosomes and half the amount of DNA.

11.) An allele that is fully expressed is referred to as (fully expressed means that the allele is transcribed and translated into a perfectly functional protein)
A) dominant.
B) recessive.
C) homologous.
D) heterozygous.

12.) When a gene for a given trait comes in alternative versions that specify different forms of the trait (for example, purple-flower and white-flower versions of a flower color gene), the versions of the gene are called
A) loci.
B) supergenes.
C) chromosomes.

D) alleles.

13) In crossing a homozygous recessive with a heterozygote, what is the chance of getting an offspring with the homozygous recessive phenotype?
A) 75% B) 25% C) 50% D) 0% E) 100%

14) In a cross between two heterozygous (Aa), results will be:
A) in the ratio 1:3 homozygous to heterozygous
B) in the ratio 1:1 homozygous to heterozygous
C) in the ratio 1 :3 heterozygous to homozygous
D) all heterozygous

15. _____ explained genetic disorders such as alkaptonuria and albinism.

a. Recessive inheritance has
b. Dominant genes have
c. X chromosomes
d. Y chromosomes

16. It is currently estimated that there are _____ human protein-coding genes although this estimate may be reduced over time.

a. 10,000–15,000
b. 19,000–20,000
c. 29,000–30,000
d. 100,000

17. The _____ is the set of observable characteristics and is the sum of genetic and environmental effects.

a. genotype
b. phenotype
c. both genotype and phenotype
d. neither genotype or phenotype

18. Nature is more important for _____ differences, while nurture has greater influence on _____ differences.

a. structural and anatomical; psychological and social
b. psychological and social; structural and anatomical
c. structural and psychological; anatomical and social
d. social and anatomical; psychological and structural

19. The epigenetic inheritance system has been described as _____ (Mayr and Provine, 1980).

a. genotype inheritance

b. soft inheritance
c. RNA inheritance
d. hard inheritance

20. _____ has been described as the phenomenon by which one genotype can give rise to a range of different physiological or morphological states in response to different environmental conditions during development (West-Eberhard, 1989).

a. Fetal plasticity
b. The fetal origins hypothesis
c. Developmental plasticity
d. Environmental plasticity

21. Intergenerational transmission to offspring can occur as a result of parental exposures to _____.

a. war
b. natural disasters
c. hunger
d. all of these

Answers Key

1.A 2.C 3.A 4.B 5.B 6.D 7.B 8.B 9.D 10.A

11.A 12.D 13.C 14.B 15.A 16. B 17.B 18.A 19. B 20.C

21.D