Test 1

1. Which enzyme is responsible for most of the elongation of a new stand in prokaryotes?

A. DNA polymerase I – replaces primer 5'–3' exonuclease activity
B. DNA polymerase II – repairs DNA
C. DNA polymerase III – synthesizes DNA
D. DNA polymerase alpha – primer in Eukaryotes
E. None of the above

2. DNA polymerase recognizes the promoter via

A. Covalent Bonds
B. Ionic Bonds
C. Hydrogen Bonds
D. Phosphodiester bonds
E. None of the above

3. A diagram of a linear chromosome is shown below. The end of the chromosome A B C or D, Which ends could not be replicated with DNA polymerase?

5'A----------3'B
3'C----------5'D

A. A & C
B. B & D
C. C & D
D. D & A
E. B & C

4. Which of the following statements is not true?

A. A DNA strand can serve as a template on many occasions.
B. A DNA double of helix may contain two strands of DNA that.....were made at the same time
C. A DNA double helix could contain one strand that is 10 generations old
D. Following semi-conservative replication, one strand is new and the other is a parent strand
E. None of the above are false

5. For an X-linked recessive trait the,

A. The F1 phenotypic ratio will be different for a cross and its reciprocal
B. The F2 phenotypic ratio will be different for a cross and its reciprocal
C. The F2 genotypic ratio will be different for a cross and its reciprocal
D. Both A & B are correct
E. Both A & C are correct

6. How many different phenotypes would be expected to occur if the genes assort independently? A

phenotype = 2^n n = only heterozygous genes
Genotype = 3^n
gametes = 2^n

A. 2
B. 3
C. 4
D. 6
E. None of the above

7. What is the probability that an offspring will be like its parent AabbCcDd if its parents' mate was AaBbCcDd

$\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{4} \cdot \frac{1}{2} = \frac{1}{16}$

Aa
AA Aa
aA aa

Bb
bb

Cc
CC Cc
cc

Dd
dd

A. 1/16
B. 1/32
C. 1/8
D. 1/256
E. None of the above

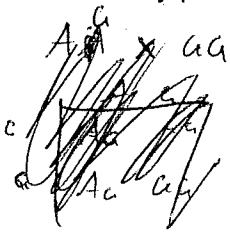
8. What is the immediate source of energy used for extending a nucleotide?

A. Sunlight
B. ATP
C. GTP
D. Removing a pyrophosphate bond form the nucleotide phosphate
E. None of the above

9. If genes assort independently, a testcross dihyybrid characteristically produces progeny phenotypes in the ratio

Aa × Aa

AaBb × aabb



A. 1:1
B. 1:2:1
C. 3:1
D. 9:3:3:1
E. 1:1:1:1

10. A process that occurs in *meiosis* but not in *mitosis* is

A. Pairing of homologs
B. Chromatid formation
C. Cell division
D.
E. Chromosome condensation (shortening)

11. This attaches to the tRNA at the CCA3' end

A. The small ribosomal subunit
B. The large ribosomal subunit
C. The appropriate amino acid
D. The appropriate codon
E. The 7 methylguanosine cap

12. Which of the follow acts before the others?

3 A. tRNA alignment with mRNA
2 B. Aminoacyl-tRNA synthetase
1 C. RNA polymerase
4 D. Ribosome movement to the next codon
5 E. Amino acid chain elongation

RNA
Aminoacyl tRNA
tRNA w/ mRNA
Ribose
AA elongation

13. Base pairing is DNA is restricted to two base pairs, represented as follows (linked signify the number of hydrogen binds). Which is the correct answer?

2 3
A. A=T and G≡C
B. A=T and G=C

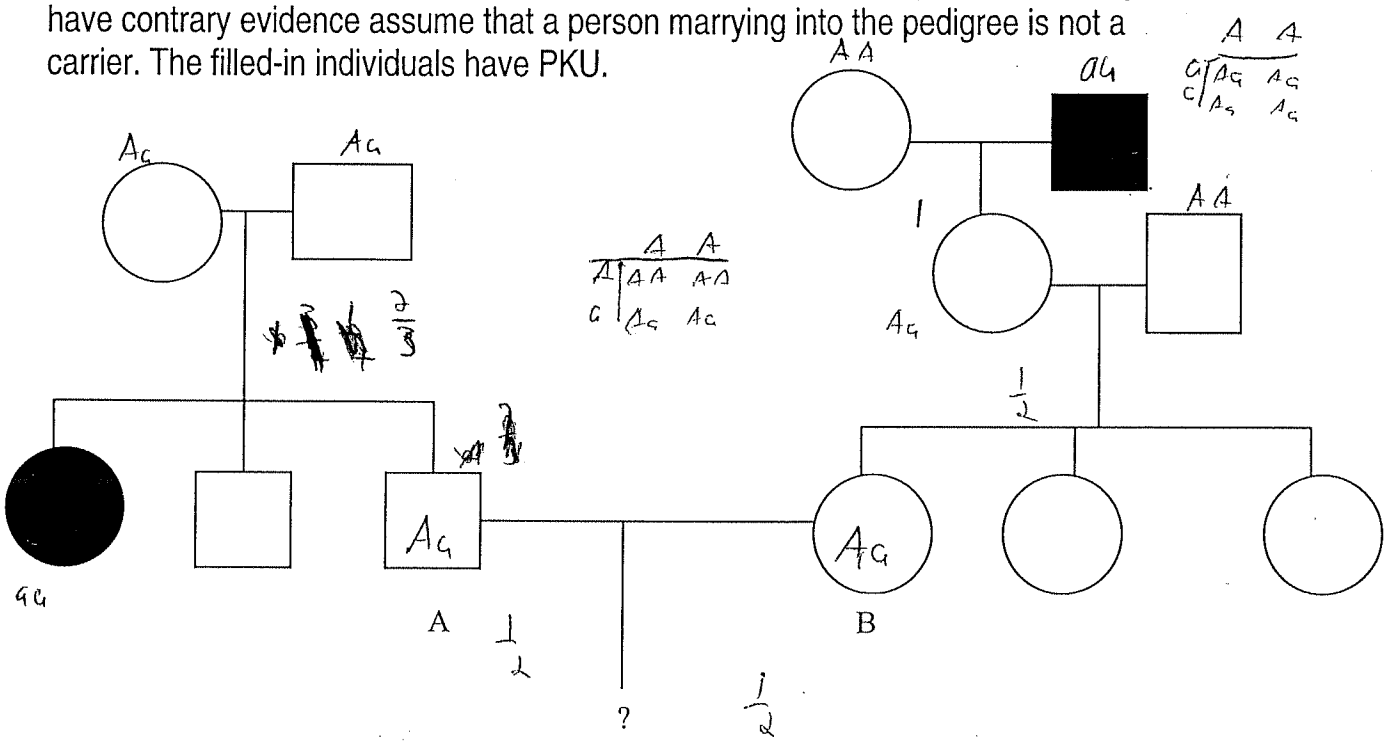
14. Okazaki fragments form on the

A. mRNA
B. 3' end of a polymerizing strand of DNA
C. leading strand
D. lagging strand
E. major groove of DNA

15. Experiments on chromosome structure and function have shown that in eukaryotic chromatids

A. There are at least 50 DNA molecules per chromatid.
B. There is more than one DNA origin of replication
C. DNA molecules duplicate conservatively rather that semiconservaitively.
D. DNA segregation to daughter chromatids occurs in a dispersive pattern.
E. Most DNA synthesis occurs during the M(mitosis) phase of the cell cycle.

16. The following pedigree concerns the autosomal recessive disease PKU. The couple marked A & B are contemplating having a baby but are concerned about the baby's having PKU. What is the probability of the first child having PKU? Unless you have contrary evidence assume that a person marrying into the pedigree is not a carrier. The filled-in individuals have PKU.



$\frac{2}{3} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{2}{24} = \frac{1}{12}$

Aa a
A AA Aa
a Aa aa

A. 0
B. **1/12**
C. ¼
D. ¾
E. 9/64

17. A plant of genotype C.C; d/d is crossed to c/c: D/D and an F1 testcrossed to c/c; d/d. If the genes are unlinked, the percentage of c/c; d/d recombinants will be

C

A. 10
B. 20
C. 25
D. 50
E. 75

18. In *Drosphila*, the two genes *w* and *sn* are X-linked and 25 map units apart. A female fly of genotype *w+sn+/w sn* is crossed to a male from a wild-type line, What percent of male progeny will be *w+sn*?

A. 0
B. 12.5
C. 25
D. 37.5
E. 50

19. Out of 800 progeny of a three-point testcross there were 16 double crossovers, whereas 80 had been expected on the basis of no interference. The interference is

observed / expected

expected observed

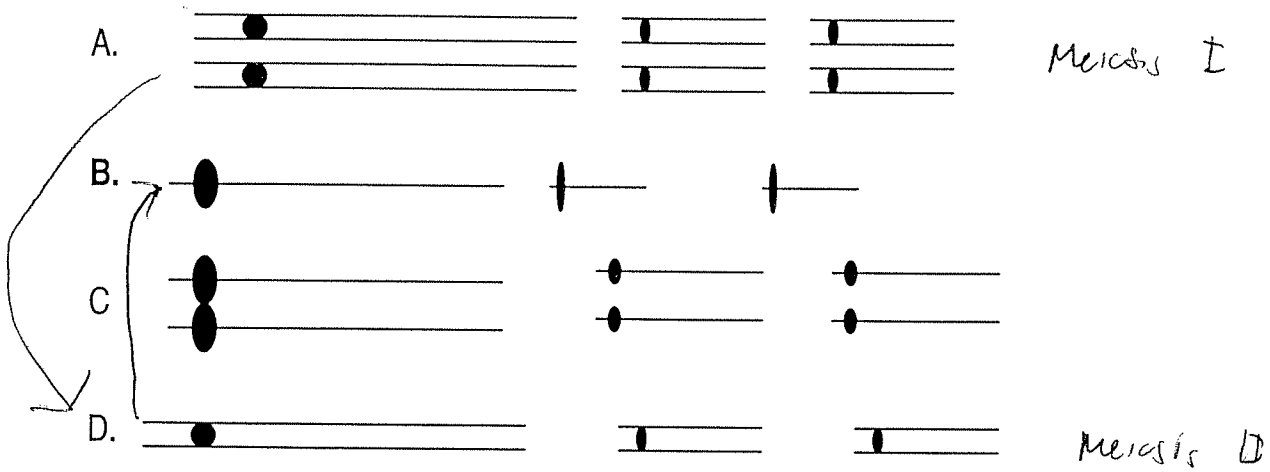
$\frac{16}{80}$ $\frac{16}{80}$ x 800

A. 0.10
B. 0.20
C. 0.05
D. 0.50
E. 0.80

$\frac{16}{80} = 0.2$

20. The F, G, and H loci are linked.....

21. In a diploid organism 2n=6, and there are two long, two intermediate, and two short chromosomes. What is the most accurate representation of a gamete resulting from meiosis in this organism?



E. None of the above

22. A characteristic of homologous chromosome is that

A. They carry alleles for the same genes in the same relative position.
B. They regularly exchange parts by crossing over at meiosis.
C. They physically pair at meiosis
D. They are found in pairs but they do not physically pair in interphase in a diploid cell.
E. All of the above

23. These structures are heterchromatic and are found at the ends of chromosomes

A. centromeres
B. centrioles
C. kinetochores
D. telomeres
E. none of the above

24. In a nucleotide, the phosphate group is bound to which carbon on the deoxyribose sugar?

A. 1'
B. 2'
C. 3'
D. 4'
E. 5'

25. Mammals typically have more DNA in their genes than do less advanced eukaryotes due to

A. Mammals requiring more complicated proteins
B. Mammals having much longer exons
C. Mammals having primarily being diploid organisms
D. Mammals primarily being diploid organisms
E. There is no obvious pattern explaining the trend

26. The redundancy of the genetic code is evident in the effect of different bases in codon poition

A. 1
B. 2
C. 3
D. 4
E. 5

27. Which of the following is not necessary for a splicesome to assemble about an intron

A. 5'GU
B. AG 3'
C. an A to serve as the branch point
D. the Shine-Dalgarno sequence ~ prokaryotes
E. none of the above

28. This enzyme unwinds the DNA helix at the start of replication

A. gyrase
B. helicase

E. none of the above

35. Which is false regarding the genetic code?

A. It is triplet
B. it is redundant
C. it is ambiguous
D. it is commaless
E. it has stop signals

36. cross

37

38. cross map units

39. cross map units

40. total map units