INTRODUCTION TO BEHAVIOR GENETICS

PSYCH 3102

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PRACTICE EXAM 1

SECTION A

Match the following definitions to the terms they define:

1. Any chromosome other than the X or Y chromosomes   ____

2. Structure composed of chromatin, found in the nucleus of a cell   ____

3. An allele that produces a particular phenotype even when present in

the heterozygous state   ____

4. The genetic constitution of an individual, or the combination of

alleles at a particular locus.   ____

5. The presence of the same allele at a locus on both members of a

homologous pair.   ____

6. Type of cell division that occurs in germ cells, producing gametes. ____

7. "Building blocks" of DNA.   ____

8. Describes the situation when a gene has multiple effects on

phenotype.   ____

9. 90% of the cell cycle is spent in the phase.   ____

10. The phenotype of an individual with only one X and no Y chromosome____

Terms

(the following may be used once, more than once, or not at all)

allele   amino acid   autosome   centromere

chromosome   DNA   dominant   Down syndrome

gamete   genotype   heterozygosity   homozygosity

interphase   Klinefelter syndrome   meiosis   mitosis

non-disjunction   nucleotides   phenotype

pleiotropy   recessive   RNA   crossing-over

monosomy   trisomy   Turner syndrome   X-linkage   zygote

Match the following events to the terms below:

11. When DNA is replicated .   ____

12. When crossing-over occurs   ____

13. When pairing of homologous chromosomes occurs ____

14. When separation of sister chromatids occurs.   ____

15. When genes are able to be expressed .   ____

17. Splicing out of introns   ____

Terms

(each term can be used once, more than once, or not at all)

mitosis   meiosis I   meiosis II   interphase   transcription

translation   replication   RNA processing   polymerization

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SECTION B

Distinguish between the following terms

16. codominance and incomplete dominance

_____

17. phenotype and genotype

_____

18. Explain the term "non-disjunction".

_____

Give an example of a disorder caused by non-disjunction and briefly explain how this disorder arises.

Example_____

How it
arises_____

19. If the following sequence shows the codons in part of an RNA molecule:

  a. show how a nonsense mutation might result in no polypeptide being produced on translation of this part of the sequence:

AAA CAC UUA GAC AAA CUA UAA

lys   his   phe   asp   lys   leu   stop

b. show a CAG (trinucleotide) 5 repeat mutation and its consequences in terms of amino acid sequence for the same sequence

 20. Define the term 'penetrance'. Give an example of an allele that is fully penetrant and an example of an allele that shows incomplete penetrance.

21. A man who is heterozygous for familial hypercholesterolemia (caused by an incompletely dominant allele) marries a normal women and they have children.

a. What is the probability that the first 2 children will have the trait?

b. What is the probability that the first 3 children will have the trait?

c. What is the probability that the first 2 *or* 3 children will have the trait?

22. A mouse geneticist discovers 2 autosomal recessive alleles, each of which , when homozygous, causes blindness. How could the geneticist determine whether the alleles occur at the same locus (ie are alleles of the same gene)?