

BIOL A201
Genetics
Exam 1
Spring 1999

Circle the letter of the BEST answer for each of the following 12 questions (3 pt ea.)

1. The synaptonemal complex
 - a. primarily functions in the contraction and coiling of chromosomes at prophase
 - b. primarily functions to move chromosomes to opposite poles during nuclear division.
 - c. is a primary constriction on the chromosome where the spindle attaches
 - d. primarily functions in the proper pairing of homologous chromosome
 - e. is also known as the first polar body

2. If the frog (*Rana pipiens*) has a chromosome number of $2n = 26$, how many different gamete types could be generated by the recombination of chromosomes (i.e., independent segregation)?
 - a. 2
 - b. 13
 - c. 26
 - d. 676
 - e. 8192

3. The frog would have ___ chromosomes in the nucleus of a normal, nondividing body cell, ___ chromosomes in an early prophase I nucleus of meiosis, and ___ chromosomes in a prophase II nucleus of meiosis.
 - a. 26, 13, 13
 - b. 26, 26, 26
 - c. 13, 13, 13
 - d. 26, 26, 13
 - e. 13, 26, 26

4. Histone proteins
 - a. Primarily function in the contraction and coiling of chromosomes at prophase
 - b. primarily function to move chromosomes to opposite poles during nuclear division.
 - c. are mostly found in the primary constriction on the chromosome where the spindle attaches
 - d. primarily function in the proper pairing of homologous chromosome
 - e. control crossing over in mid-prophase I of meiosis

5. In oogenesis in humans, much of the early and middle stages of prophase I occur
 - a. during fetal development
 - b. during the first few weeks of puberty
 - c. during ovulation
 - d. during sperm penetration

6. According to Mendel, when the pair of factors controlling a particular trait are different from one another, one factor will mask the expression of the other factor. This became known as
 - a. the principle of pangenesis
 - b. the principle of dominance
 - c. the principle of segregation
 - d. the principle of paired factors
 - e. the principle of acquired characteristics

Write name on back of exam.

7. Widow's peak is a human phenotype of the hairline shape, which is dominant to continuous hairline. Continuous hairline is the derived phenotype. The widow's peak allele would best be represented by
a. WW b. ww c. CC d. cc e. C
8. A garden pea is homozygous dominant for yellow seeds and is crossed with a garden pea that is homozygous recessive for green seeds. Progeny seeds resulting from this cross would be expected to be
a. 50% yellow and 50% green
b. 75% yellow and 25% green
c. 100% yellow
d. 100% green
9. The progeny from the previous question are test crossed. The progeny seeds resulting from this test cross would be expected to be
a. 50% yellow and 50% green
b. 75% yellow and 25% green
c. 100% yellow
d. 100% green
10. The blood types of two parents are type A and type AB, respectively. Which of the following is NOT a potential blood type of an offspring from these parents?
a. A
b. B
c. O
d. AB
e. None (i.e., all are potential blood types of the offspring)
11. A dominant genetic disorder in humans is retinoblastoma. This is manifested in childhood or adolescence as cancer of the retina. One normal parent and one with retinoblastoma have a normal, adolescent child. What is the likelihood that this child will pass the retinoblastoma gene on to its offspring?
a. 0 b. 50% c. 100%
12. Genetic testing now makes it possible to screen individuals to determine if they are carriers for genetic disorders such as cystic fibrosis. If a couple is screened and the husband is identified as a carrier and the wife is not, what is the probability they will have a child with cystic fibrosis?
a. 0 b. 25% c. 50% d. 100%

