Biology 111 In-class Exam #3 April 3, 2009

For each question or statement select the best answer or completion. Mark your selections on a scantron form using a pencil.

1. While the mechanism of mitosis is remarkably similar across eukarotes, the events of cytokinesis vary. In plants division of the cytoplasm involves formation of ...
   a) a cell plate b) a cytoskeleton c) a nucleolus d) a cleavage furrow e) none of these

2. In animals cytokinesis involves formation of ...
   a) a cell plate b) a cytoskeleton c) a nucleolus d) a cleavage furrow e) none of these

3. The portion of the cell cycle between cell division events is called ____1_____ and is itself divided into three periods that include in order _____2_____ .
   a) 1. prophase 2. G_1, G_2, G_3
   b) 1. diaphase 2. G_3, G_2, G_1
   c) 1. introphase 2. S, G_1, G_2
   d) 1. interphase 2. G_1, S, G_2
   e) 1. telophase 2. G_1, G_2, S

4. Cells with pairs of chromosomes (i.e. containing homologous chromosomes) are by definition ...
   a) devoid b) diploid c) haploid d) polyploid e) both a and d

5. Egg and sperm are both referred to as ...
   a) diploids b) prokaryotes c) bacteria d) zygotes e) gametes

6. Because egg and sperm do not have homologous chromosomes (i.e. have only unpaired chromosomes), they are ...
   a) devoid b) diploid c) haploid d) polyploid e) both a and d

7. Fusion of sperm and egg produces the first cell of a new organism called a ...
   a) diversion b) prokaryote c) bacteria d) zygote e) gamete

8. In meiosis, separation of chromatids occurs in ...
   a) prophase III b) anaphase I c) anaphase II d) prophase I e) diaphase II

9. In Meiosis, separation of homologous pairs occurs in ...
   a) prophase III b) anaphase I c) anaphase II d) prophase I e) diaphase II

10. In meiosis, crossing over occurs in ...
    a) prophase III b) anaphase I c) anaphase II d) prophase I e) diaphase II

11. In meiosis, homologous chromosomes synapse (i.e. come together along their length) in ...
    a) prophase III b) anaphase I c) anaphase II d) prophase I e) diaphase II

12. The end product of meiosis of a diploid cell is four cells that are ____1_____ and contain __ 2 ___ chromosomes .
    a) 1. haploid 2. replicated
    b) 1. diploid 2. unreplicated
    c) 1. polyploid 2. replicated
    d) 1. haploid 2. unreplicated
    e) 1. diploid 2. replicated

13. Sexual reproduction occurs in all groups of eukaryotic organisms. It appears to offer a clear advantage over asexual reproduction in that it ...
    a) spreads beneficial mutations within populations
    b) prevents disease
    c) results in a higher number of offspring
    d) is more rapid than asexual reproduction
    e) increases the likelihood of reproduction

14. The sex of each individual human is primarily determined by the presence or absence of a single gene, the SRY gene, which is located on ...
    a) the mitochondrial chromosome b) chromosome 21 c) the X chromosome
    d) the Y chromosome e) both X chromosomes

15. In the haploid lifecycle typical of unicellular protists, mitosis only occurs in
    a) aneuploid cells b) polyploid cells c) both haploid and diploid cells
    d) haploid cells e) diploid cells

16. In the diploid lifecycle typical of animals, mitosis only occurs in
    a) aneuploid cells b) polyploid cells c) both haploid and diploid cells
    d) haploid cells e) diploid cells

17. In the alternation of generations lifecycle typical of plants, mitosis only occurs in
    a) aneuploid cells b) polyploid cells c) both haploid and diploid cells
    d) haploid cells e) diploid cells

18. Gregor Mendel studied genetic inheritance in peas as a ...
    a) monk at an abbey in central Europe b) scientist at Oxford University
    c) retired person in Sweden d) US Dept of Agriculture employee
    e) director of a botanical garden in Argentina

19. The location of a gene on a chromosome or homologous pair of chromosomes is called ...
    a) a gene recess b) an allele c) an autosome d) a diploid e) a locus.

20. Alleles are ...
    a) chiasmata b) various forms of a gene c) autosomes d) loci. e) chromatids

21. Assuming A is dominant over a, in a cross between AA and aa the offspring will ...
    a) have the same genotype as the aa parent
    b) have the same genotype as the AA parent
    c) have the same phenotype as the aa parent
    d) have the same phenotype as the AA parent
    e) none of these

22. Individuals with a recessive phenotype ...
    a) are true breeding if crossed with others with the same phenotype
    b) can be produced only if both of the parents had a different phenotype
    c) can’t pass their trait to the next generation regardless of who they mate with
    d) none of these
    e) both b and c

23. Assuming B is dominant over b, both BB and Bb individuals have ...
    a) the same genotype b) the same phenotype c) the same parents
    d) the same alleles e) both a and b

24. In a monohybrid cross, between a homozygous dominant individual and an individual homozygous recessive for the same trait, what allele appears to disappear in the F_1 though it remains heritable?
    a) sex-linked b) dominant c) recessive d) codominant e) lethal

25. In monohybrid crosses where homozygous dominant individuals are first crossed with homozygous recessive individuals and the resulting F_1 generation is then allowed the interbreed, the resulting F_2 generation will consist of individuals with the phenotypes of the original parents in a ratio of:
    a) 9:3:3:1 b) 3:1 c) 1:1 d) 2:1 e) 5:1

26. If the F1 individuals from the preceding experiment are bred instead with the homozygous recessive parent. The resulting progeny will be a mix of phenotypes in a ratio of:
    a) 9:3:3:1 b) 3:1 c) 1:1 d) 2:1 e) 5:1

27. In a <u>dihybrid</u> cross where individuals homozygous dominant for two separate genetic traits are first crossed with individuals homozygous recessive for both traits and then the resulting F_1 generation is allowed the interbreed the resulting F_2 generation will consist of individuals with the phenotypes of the original parents in a ratio of:
    a) 9:3:3:1 b) 3:1 c) 1:1 d) 2:1 e) 5:1

28. The law of segregation states that...
    a) dissimilar genes will not occur together
    b) mating is random between individuals
    c) during gamete formation each gamete receives only one allele of each gene
    d) crossing over occurs at least once between homologous chromosomes
    e) different segregating allele pairs behave independently of other allele pairs

29. The law of independent assortment states that ...
    a) dissimilar genes will not occur together
    b) mating is random between individuals
    c) during gamete formation each gamete receives only one allele of each gene
    d) crossing over occurs at least once between homologous chromosomes
    e) different segregating allele pairs behave independently of other allele pairs

30. The law of independent assortment ...
    a) does not hold when animal and insect genes are studied
    b) does not hold when gene pairs are located on linked loci
    c) has never been observed not to apply
    d) holds only for diploid life cycles
    e) is only true of plants

31. In the case of genes that are tightly linked when a dihybrid cross is performed and the F_1 generation is interbred, the resulting the F_2 produced will be a mix of individuals most with the phenotypes of the original parents in a ratio of:
    a) 9:3:3:1 b) 3:1 c) 1:1 d) 2:1 e) 5:1

32. Discovery of sex-linked (or X-link) genes occurred in the early 1900s as a result of breeding experiments done at Columbia university using …..
    a) chimpanzees b) dinosaurs c) old people d) fruit flies e) rats

33. In the experiments at Columbia, a white-eyed male was first mated with a red-eyed female. All the F1 had red eyes but crosses between these offspring produced a 3:1 ratio of red eyed to white eyed individuals but ….
    a) all the white eyed individuals were male b) all the white eyed individuals were female
    c) all the males died before sexual maturity d) there were no females
    e) many did not have eyes at all

34. The discovery of the law of segregation is credited to...
    a) Rudolf Virchow b) R.C. Punnett c) T. H. Morgan d) Robert Hooke e) Gregor Mendel

35. The discovery of the law of independent assortment is credited to ...
a) Rudolf Virchow b) R.C. Punnett c) T. H. Morgan d) Robert Hooke e) Gregor Mendel

36. The discovery of the gene linkage is credited to...
a) Rudolf Virchow b) R.C. Punnett c) T. H. Morgan d) Robert Hooke e) Gregor Mendel

37. The discovery of sex-linkage is credited to...
a) Rudolf Virchow b) R.C. Punnett c) T. H. Morgan d) Robert Hooke e) Gregor Mendel

38. An example of sex-linked inheritance is ...
a) Huntington's disorder in humans b) phenylketo urea (PKU) in humans c) flower color in snap dragons
d) A, B, AB, O blood types in humans e) red-green color blindness in humans

39. An example of co-dominance is ...
a) Huntington's disorder in humans b) phenylketo urea (PKU) in humans c) flower color in snap dragons
d) A, B, AB, O blood types in humans e) red-green color blindness in humans

40. An example of autosomal recessive inheritance is ...
a) Huntington's disorder in humans b) phenylketo urea (PKU) in humans c) flower color in snap dragons
d) A, B, AB, O blood types in humans e) red-green color blindness in humans

41. An example of autosomal dominant inheritance...
a) Huntington's disorder in humans b) phenylketo urea (PKU) in humans c) flower color in snap dragons
d) A, B, AB, O blood types in humans e) red-green color blindness in humans

42. An example of incomplete dominance inheritance...
a) Huntington's disorder in humans b) phenylketo urea (PKU) in humans c) flower color in snap dragons
d) A, B, AB, O blood types in humans e) red-green color blindness in humans

43. Death could result if ...
a) A type blood is given to an A blood type person b) B type blood is given to an B blood type person
c) AB type blood is given to an A blood type person d) AB type blood is given to an B blood type person
e) AB type blood is given to an O blood type person

44. If a A blood type individual marries an B blood type person, their children will have ...
a) A blood type b) B blood type c) AB blood type d) O blood type e) any of these

45. The heir to the Russian throne at the time of the Russian revolution suffered from hemophilia A, a sex-linked condition, which he contracted ...
a) from consorting with peasants b) as a genetic disorder from his mother c) as a genetic disorder from his father
d) during imprisonment e) as a genetic disorder not identified with either parent

46. Examples of aneuploidy include ...
a) Down syndrome b) Klinefelter syndrome c) Turner's syndrome d) a and b e) a, b, and c

47. Humans born with three of chromosome 21 suffer from ...
a) Down syndrome b) Klinefelter syndrome c) Turner's syndrome d) a and b e) a, b, and c

48. Human females born with only one X chromosome have from ...
a) Down syndrome b) Klinefelter syndrome c) Turner's syndrome d) a and b e) a, b, and c

49. Human males born with two X chromosome suffer from ...
a) Down syndrome b) Klinefelter syndrome c) Turner's syndrome d) a and b e) a, b, and c

50. Human males born with two Y and an X chromosome are …
a) nonexistent b) unusually tall and perhaps violent c) short and shy d) fifty percent of males e) both c and d