Choose the alternative that best completes the statement or answers the question. Mark your answers on the Scantron sheet. 2 points each.

Ch10

1. __________ is the stage of mitosis characterized by the alignment of the chromosomes in a ring along the inner circumference of the cell.  A. Interphase  B. Telophase  C. Prophase  D. Metaphase

2. In the human, the body cells (non-sex cells) contain two sets of chromosomes totaling  A. 2.  B. 22.  C. 44.  D. 46.  E. 23.

3. Which one of the following represents interphase?  A. G1 + G2 + S  B. S + M + C  C. prophase + metaphase + anaphase + telophase  D. cytokinesis + mitosis  E. G0 + G1 + G2

4. A cell biologist is conducting a karyotype procedure on alligator red blood cells. Exactly what does this mean?  A. It means that red blood cells from the alligator will be examined with a microscope and the nuclei will be counted.  B. It means that red blood cells from the alligator will be examined using restriction enzymes to count the number of centromeres that are present on the chromosomes.  C. It means that chromosomes from the red blood cells of the alligator will be examined with a microscope, photographed, counted, lined up with their respective homologous partner, and displayed.  D. It means that chromosomes from the red blood cells of the alligator will be examined with a microscope to determine the amount of hemoglobin present.

5. In humans the diploid number of chromosomes is 46. The haploid number is 23. Prior to mitosis in the cell cycle, the cell is in the G2 phase. Which of the statements is true?  A. The homologous chromosomes are lined up on the equator.  B. The homologous chromosomes have all been copied through DNA replication and are now sister chromatids.  C. The homologous chromosomes have been pulled to their respective poles by the spindle apparatus.  D. The homologous chromosomes have not been replicated yet.  E. The homologous chromosomes are now in the haploid or n condition.

Ch11

6. _______ cells such as gametes contain one set of chromosomes.  A. Muscle  B. Somatic  C. Diploid  D. Haploid

7. The pairing of chromosomes along their lengths which is essential for crossing over is referred to as  A. syngamy.  B. synapsis.  C. prophase.  D. recombination.  E. centromere.

8. Which of the following statements regarding sexual reproduction is true?
   A) Sexual reproduction creates an individual that is a genetic copy of one parent.
   B) Sexual reproduction generates greater genetic variation than asexual reproduction.
   C) Sexual reproduction allows animals to expand their populations faster than asexual reproduction.
D) Populations of organisms that reproduce through sexual reproduction generally have difficulty adapting to changing environments.

E) Sexual reproduction produces 2n gametes.

9. Meiosis results in a change in chromosome number indicated by
   A) 2n to 2n.
   B) 2n to n.
   C) n to 2n.
   D) n to n.
   E) 2n to 2n in diploid organisms, n to n in haploid.

10. Nondisjunction occurs when
    A) a portion of a chromosome breaks off and is lost.
    B) chromosomes replicate too many times.
    C) two chromosomes fuse into one.
    D) members of a chromosome pair fail to separate.
    E) an entire pair of chromosomes is lost during meiosis I.

Ch12

11. Mendel used the garden ___ plant for his studies on inheritance.  A. lily  B. carrot  C. onion  D. pea

12. A diploid organism that has two identical alleles for the same trait is called _______ for that particular trait.  A. homozygous  B. heterozygous  C. dominant  D. recessive  E. codominant


14. Let P = purple flowers and p = white, and T = tall plants and t = dwarf. What would be the appearance of a plant with the genotype PpTt?  A. purple flowers, tall B. purple flowers, dwarf C. white flowers, tall D. white flowers, dwarf E. pale purple flowers, intermediate height

15. Let P = purple flowers and p = white, and T = tall plants and t = dwarf. What combinations of gametes could be produced by a heterozygote for both the traits?  A. PpTt only B. Pp, Tt C. P, p, T, t D. PT, Pt, pT, pt E. infertile, no gametes produced

16. Let P = purple flowers and p = white, and T = tall plants and t = dwarf. Of the 16 possible gamete combinations in the dihybrid cross, how many would be the phenotype white, tall?  A. none B. 1 C. 3 D. 9 E. 16

17. Irene and William are having their first child. Irene knows her blood type is A, but William does not know his blood type. However, William knows that his mother and father were B. Their first child is a boy named Gregory. Gregory has type O blood. Of course, Irene and William do not understand how this happened. You could explain this to them using which of the following choices?  A. Irene's genotype is AA, and William's genotype is OO; thus, Gregory expresses the phenotype of O.  B. Irene's genotype is AO, and William's genotype is BO; thus, Gregory expresses the phenotype of O.  C. Because his parents were both type B, William could not be the father of Gregory.  D. Gregory's blood type will need to be checked after his first month of life if the parents want to know his blood type. It takes about a month for the blood type to develop in a
newborn child. E. Since Irene is type A, there had to be a mix-up in the lab report. Gregory should have been type A.

Ch13

18. Of the 23 pairs of human chromosomes, 22 pairs are similar in the location of genes and are found in both males and females. These are called _________.  A. chromosomes  B. autosomes  C. alleles  D. gametes

19. In humans, if a non-disjunction event led to an individual with a genotype of XXY, they would  A. be female because they have two X chromosomes. B. be male because they have a Y chromosome. C. display both male and female characteristics. D. not survive.

20. Which offspring will inherit all their mitochondria DNA from their mother and none from their father?  A. daughters  B. sons  C. both sons and daughters  D. Mitochondria DNA is inherited from both parents

21. Crossing over ________ genes into assortments of ________ not found in the parents.
   A) recombinates unlinked . . . genes
   B) recombinates linked . . . alleles
   C) combines unlinked . . . alleles
   D) combines linked . . . genes
   E) recombinates unlinked . . . chromosomes

Identify the cell cycle stage/phase of the indicated plant cells “A-E”.

A.  B.  C.  D.  E.