1. A starch is made up of how many sugar subunits?
   a. 1   b. 2   c. 3   d. many

2. What architectural structure on campus is most like the shape of a DNA molecule?
   a. The spiral staircase in Rendleman hall
   b. The flat roof of the Science building
   c. The bridge from Prairie Hall to Alumni Hall
   d. The cross structure of the Dormitory building

3. A hydrophobic molecule such as a fat molecule will not dissolve in water because
   a. It has areas of + and - electrical charge on its surface that attract water molecules
   b. It does not have electrical charges on its surface so it does not attract water molecules

4. Cilia and flagellae are similar structures because they
   a. Have the 9+2 microtubule structure
   b. They both process proteins in the cell
   c. They both are involved in cell division
   d. They both are made of nucleic acid

5. A woman has a child with Down's syndrome. What is the probability that her second child will also have Down's syndrome?
   a. 100%
   b. 50%
   c. 25%
   d. We can't tell. Most Down's syndrome is not inherited in a Mendelian way.

6. The purpose of the spindle in mitosis and meiosis is:
   a. To keep chromosomes in place on the metaphase plate
   b. To drag the chromosomes or chromatids apart and locate them at each pole of the cell
   c. To allow the cell to move
   d. To produce nucleotides

7. Tasters are humans who can taste the chemical PTC. The gene for tasting is a dominant gene. Suppose a male who is a taster marries a female who is a non-taster. One of their children is a non-taster. What is the genotype of the male?
   a. Homozygous for the taster gene
b. Heterozygous for the taster gene
c. You can't tell from the information given.

8. Osmosis takes energy
   a. True  b. False

9. When certain genes tend to stay together and appear together in offspring, they are said to be:
   a. mutants
   b. linked
   c. sex-linked
   d. pleiotropic

10. You have 46 chromosomes. How many did you inherit from your father?
    a. 23  b. 34.5  c. All 46  d. None

11. The Christmas Fern has a diploid number of 111.
    a. True  b. False

12. The particular genetic constitution of an organism is called the

13. If Mendel takes the progeny of the cross between tall and dwarf peas and crosses them and they produce 100 offspring, how many offspring are likely to be dwarf? Remember, the original pea strains that Mendel used breed true.
    a. 100
    b. 50
    c. 25
    d. 0

14. Will the daughters of a color blind woman be colorblind?
    a. Yes
    b. No
    c. We can't tell unless we know if the father is colorblind.

15. Inherited characteristics are carried as discrete units called ________.
    a. Enzymes
    b. Chromosomes
    c. Mitochondria
    d. Genes

16. The earliest known cells seem to have been ________.
17. The metaphase plate is:
   a. Really the diaphragm which is located just posterior to the lungs
   b. Where the chromosomes go
   c. The plane on which the chromosomes line up
   d. Location of the chromosomes in anaphase

18. Height in humans is a __________ trait:
   a. Simple Mendelian
   b. Dominant
   c. Recessive
   d. Polygenic

19. What is the function of meiosis in the life of eukaryotes?
   a. To assure that each daughter cell gets exactly the same genetic information
   b. To keep the genome together and prevent genetic variability in offspring
   c. To "scramble" the genome and encourage genetic variability in offspring
   d. To ensure "survival of the fittest"

20. Phospholipids are peculiar compounds that are used to make cell membranes. The property that fits them for this job is:
   a. The are non-polar
   b. They are made up of fatty acids
   c. One end of the molecule is hydrophilic and the other is hydrophobic.

21. Peptide bonds are:
   a. The special kinds of chemical bonds in sugars
   b. The same as covalent bonds
   c. The weak bonds formed between water molecules
   d. The name biologists give to bonds between amino acids in a protein

22. An astronomer cannot do experiments on his subject. Can he test an hypothesis?
   a. Yes       b. No

23. An ecologist is testing the effect of a chemical on a lake. He partitions the lake into two halves. The chemical cannot go through the partition. The ecologist adds the chemical to the half of the lake on one side of the partition and leave the other side untreated. He observes the changes that occur in both sides. What can we call the untreated side?
   a. The experimental side
   b. The control side
   c. The placebo side
   d. The unknown half
24. Ribosomes are the sites of:
   a. Energy Storage
   b. Photosynthesis
   c. Protein synthesis
   d. Cellular control

25. You have a single nucleotide strand. It has the following base sequence:

   A-U-C-G-A

   What kind of nucleic acid is it?
   a. RNA
   b. DNA
   c. We don't know from the information given

26. A codon is:
   a. A gene
   b. A protein
   c. A sequence of three bases that codes for an amino acid on DNA or RNA
   d. A sequence of three base pairs that codes for a sugar in a starch

27. Which of the following is the best molecular genetics definition for a gene?
   a. One complete turn of the DNA double helix
   b. Three bases in a row
   c. The base sequence that codes for a particular enzyme (protein)
   d. A series of similar base pairs on the DNA strand

28. Activation energy is important in enzymatic reactions. What is its importance?
   a. It is the energy used by the enzyme to make the reaction work
   b. An enzyme reduces the activation energy of a reaction so that the reaction will work at normal temperatures and pressures
   c. The activation energy is the energy released in an exergonic reaction.
   d. The activation energy is the energy required to make an endergonic reaction work.

29. Which yields more energy, anaerobic respiration or aerobic respiration?
   a. Anaerobic respiration
   b. Aerobic respiration

30. When a molecule of glucose is oxidized during cellular respiration, what is the source of the largest number of ATP molecules?
   a. Glycolysis
   b. The Krebs Cycle
   c. The electron transport chain (oxidative phosphorylation)
31. When a muscle operates anaerobically during heavy exercise, which of the following is producing the energy for muscle contraction?
   a. Glycolysis
   b. The Krebs Cycle
   c. The electron transport chain (oxidative phosphorylation)
   d. All of the above

32. Where does oxidative phosphorylation occur?
   a. The cell nucleus
   b. Only in muscles
   c. Only on the Golgi apparatus
   d. Only in the inner membranes of the mitochondria

33. When you are exercising a lot, you feel a dull burning pain in your muscles which is described by some athletes as "feeling the burn".
   a. "The burn" comes from the destruction of muscle tissue by straining it too hard.
   b. "The burn" does not actually come from the muscles but from their associated bone which is damaged by the pressures being exerted on it.
   c. "The burn" is a accumulation of lactic acid in the tissues caused by anaerobic respiration (glycolysis).
   d. "The burn" is caused by an accumulation of steroids in the muscles. Steroids are always bad

34. How many crosses appear to the lower left hand side of this page?
   a. One  b. Two  c. Three  d. Four