(複選題，每題4分，25題，共計100分)

1. Why is ATP an important molecule in metabolism?
   1. Its phosphate bonds are easily formed and broken.
   2. It is extremely stable.
   3. Its hydrolysis is endergonic.
   4. It has high-energy phosphate bonds.
   5. It is allosteric regulated.
2. Cells can be described as having a "cytoskeleton" of internal structures that contribute to the shape, organization, and movement of the cell. All of the following are part of the "cytoskeleton" EXCEPT?
   1. histone
   2. actin
   3. ankyrin
   4. intermediate filament
   5. microfilament
3. One of the functions of cholesterol in animal cell is to?
   1. facilitate transport of lipid
   2. store energy
   3. speed diffusion
   4. phosphorylate fatty acid
   5. maintain membrane fluidity
4. Which process in eukaryotic cells will normally proceed whether O_2 is present or absent?
   1. fermentation
   2. glycolysis
   3. Krebcycle
   4. electron transport

5. protein synthesis

5. The primary function of the light reaction of photosynthesis is
   1. to make ATP.
   2. to produce energy-rich glucose from H_2O and CO_2.
   3. to produce energy-rich ATP and NADPH.
   4. to make glucose.
   5. to convert chemical energy to light energy.

6. A cell with 24 chromosomes (diploid number) goes through the cell cycle. The number of chromosomes in the S phase is
   1. 12.
   2. 24.
   3. called the S number of chromosomes.
   4. 48.
   5. called haploid.

7. Any genetic differences in a clone are due to which process?
   1. independent assortment
   2. recombination
   3. crossing over
   4. mutation
   5. synapsis

8. In crossing a homozygous recessive with a heterozygote, what is the chance of getting a homozygous recessive phenotype in the F1 generation?
   1. 0%
   2. 25%
   3. 50%
   4. 75%
   5. 100%

9. The following is a list of chronosomal alterations. Which one of these would automatically cause two of the others?
   1. reciprocal translocation
   2. deletion.
   3. duplication
   4. inversion
   5. nonreciprocal translocation

10. What is the primer that is required to initiate the synthesis of a new DNA strand?

1. RNA
2. DNA
3. protein
4. ligase
5. primase

11. An eukaryotic protein is 100 amino acid long. Which of the following could be the number of nucleotides in the DNA that codes for this protein?
1. 100
2. 200
3. 300
4. 600

12. Which of the following does not consist of a sequence of bases?
1. repressor
2. structural gene
3. promoter
4. regulator gene
5. operator

13. An eukaryotic gene typically has all of the following features except?
1. introns
2. an operator
3. a promoter
4. exon
5. regulator gene

14. Restriction fragments of DNA are separated from one another by which process?
1. filtering
2. HPLC
3. gel electrophoresis
4. GC
5. centrifugation

15. Anatomical structures that show similar function but dissimilar embryonic and evolutionary background are said to be
1. paleontological.
2. primitive.
3. homologous.
4. analogous.

5. monophyletic.

16. Which factor is the most important in producing the variability that occurs in each generation of humans?
1. genetic drift
2. genetic recombination
3. genetic migration
4. genetic variation
5. genetic blockade

17. The origin of a new plant species by hybridization coupled with nondisjuction is an example of
1. allopatric speciation.
2. sympatric speciation.
3. introgressive speciation.
4. random speciation.
5. differential speciation.

18. Which of the following factors was most important in the very early origin of life?
1. natural selection
2. competition of oxygen
3. biotic synthesis of organic molecules
4. high levels of freon in the atmosphere
5. low levels of solar energy

19. The oxygen revolution probably began with the origin of
1. plants.
2. prokaryotes.
3. cellular respiration.
4. cyanobacteria.
5. green sulfur bacteria.

20. In ferns, what does the spore become?
1. moss
2. sporangium
3. rhizome
4. sporophyte
5. gametophyte

21. Which of the following has not been established as aspect of auxin's role in cell

elongation?

1. Auxin instigates a loosening of cell wall fiber.
2. Auxin increases the quantity of cytoplasm in the cell.
3. Through auxin activity, vacuoles increase in size.
4. Auxin stimulates proton pumps.
5. Auxin activity permits an increase in turgor pressure.

22. Air flows continuously in one direction through the lungs of which animals?

1. birds
2. frogs
3. insects
4. mammals
5. earthworm

23. The function of protein kinases is to

1. add a phosphate to other proteins.
2. add a phosphate to ADP.
3. add a phosphate to G proteins.
4. add a phosphate to first messengers.
5. add a phosphate to second messengers.

24. The area of the brain most intimately associated with the unconscious control of respiration and circulation is the

1. hypothalamus.
2. basal ganglia.
3. medulla.
4. pituitary gland.
5. cerebellum.

25. Biologist term an organism's physiological adjustments to a change in an environmental factor as

1. evolution.
2. transformation.
3. adaptation.
4. habituation.
5. acclimation.