Biology EOC Review Guide

UNITS 5 & 6: (DNA & GENETICS)

1. What does DNA code for?

2. DNA is a polymer of what?

3. What are the three parts of a nucleotide?

4. What bases pair with each other in DNA?

5. What part of DNA determines which proteins will be made?

6. Draw a double helix DNA strand with the following bases on one side : ATTGC, labeling the following : bases, sugar, phosphate, & hydrogen bonds.

7. What is the goal of protein synthesis?

8. In which two organelles does protein synthesis occur?

9. What are the two steps in protein synthesis?

10. Fill in the following chart:

	DNA	RNA
Made up of a polymer of …		
Sugar		
# of strands		
Base pairing		

11. Describe each type of RNA:

a. mRNA

b. tRNA

c. rRNA

12. Where does transcription take place?

13. Summarize what happens during transcription.

14. What is the end result of transcription?

15. Where does translation take place?

16. Summarize what happens during translation.

17. What is the end result of translation?

18. What determines which protein is made?

19. Differentiate between an anticodon and a codon.

20. Define a mutation.

21. What causes a mutation? Give examples.

22. Describe each of the following DNA mutations:

a. deletion

b. insertion

c. substitution

23. What does gel electrophoresis do?

24. What is gel electrophoresis used for?

25. Summarize the steps of gel electrophoresis.

26. What is a clone?

27. What is a transgenic organism?

28. What is recombinant DNA?

29. What do restriction enzymes do to DNA?

30. Summarize the steps of creating a transgenic organism.

31. Give 2 applications of using a transgenic organism.

32. What was the goal of Human Genome Project?

33. Describe how gene therapy is used to treat the following diseases:

a. SCID

b. Cystic Fibrosis

34. How can embryonic stem cells be used to treat different disease?

35. What is the limitation is using adult stem cells vs. embryonic stem cells?

36. What is a GMO?

37. Give 2 examples of a GMO.

38. Fill in the following chart:

	Asexual Reproduction	Sexual Reproduction
How many parents are involved?		
Do the offspring express variation?		
Is the fusion of gametes involved?		
Which form of cell division is associated with this process (mitosis or meiosis)?		

39. Define the following examples of asexual reproduction:

a. binary fission

b. regeneration

c. budding

40. Fill in the following chart:

	Mitosis	Meiosis
Cells that undergo this process		
Number of cell divisions		
Number of cells produced		
Type of cell produced (haploid/diploid)		
Drawing		

41. Define the following terms:

a. gametes

b. somatic cells

c. zygote

d. haploid

e. diploid

f. chromosome

g. homologous chromosomes

42. Describe the following sources of genetic variation and give an example of a disease caused by each one

a. Crossing over

ex:

b. Nondisjunction

ex:

43. Define the following terms:

a. fertilization

b. gene

c. allele

d. dominant

e. recessive

f. homozygous

g. heterozygous

h. genotype

i. phenotype

44. Summarize the following:

a. Mendel's Law of Segregation

b. Mendel's Law of Independent Assortment

45. Know how to do the following punnett squares:

a. In mice, black fur is dominant to white fur. Cross a white mouse with a heterozygote.

b. In chickens, black feathers are co-dominant to white feathers. Cross 2 checkered chickens.

c. In roses, red and white petals are incompletely dominant. Cross a red rose and a white rose.

d. A woman with type AB blood marries a man who is type A blood, but has a mother with type O blood. What are the possible blood types of the children.

e. In humans hemophilia is a sex-linked recessive trait. Cross a man with hemophilia with a woman with no family history of hemophilia.

46. Which parent determines the gender of the offspring?

47. When a male inherits a sex-linked trait, which parent did he inherit it from?

48. Describe polygenic inheritance. Give 2 examples.

49. Draw a pedigree of a family with the following characteristics

a. a mother and a father with 2 children - a boy and a girl in that order
b. both children married and had 1 daughter each.
c. in your pedigree, free ear lobes are dominant to attached ear lobes - color in those with free ear lobes
d. the father has free ear lobes along with both of his children and his grandchildren
e. determine the genotype of everyone in the family

50. Fill in the following chart:

	Dominant or Recessive	Summary
Cystic Fibrosis		
Tay Sachs		
PKU		
Huntington's Disease		

51. Be able to analyze a karyotype.
    a. What are first 22 pairs of chromosomes called?

    b. What do the last pair of chromosomes tell us?

52. List 3 environmental factors that influence gene expression.

53. What do each of the following environmental conditions lead to?

    a. tobacco use →

    b. sun exposure →

    c. diet and genetic interaction →

    d. diet and genetic interaction →