

Test Two Study Guide

1. Describe what is happening inside a cell during the following phases (pictures may help but try to use words):

Interphase:

(Mitosis):

Prophase:

Metaphase:

Anaphase:

Telophase:

Cytokinesis:

2. What is the difference between prophase of mitosis and prophase 1 of meiosis?

3. In meiosis, what is the difference between metaphase 1 and metaphase 2?

4. What is the difference between telophase and cytokinesis?

5. How do a plant cell and an animal cell differ during cytokinesis?

6. Explain what is meant by crossing-over (recombination). Be sure and mention at what time it is taking place within the cell.

7. What is a nondisjunction event? Give an example using trisomy 21.

8. Describe Gregor Mendel's following laws:

Law of Segregation

Law of Independent Assortment

9. Why was Mendel considered "lucky"?

10. Deafness is a recessive disorder. Using a capital letter "D" to symbolize hearing and lower case "d" to show deafness make a Punnett square showing two heterozygotes mating.

11a. According to the above square, what is the genotype for a homozygous hearing individual? What is the phenotypic ratio for that individual?

b. What is the genotype for a carrier of the deafness gene? (Remember that carrier means those that have one copy of the allele for the recessive disorder but do NOT display symptoms). What is the phenotypic ratio?

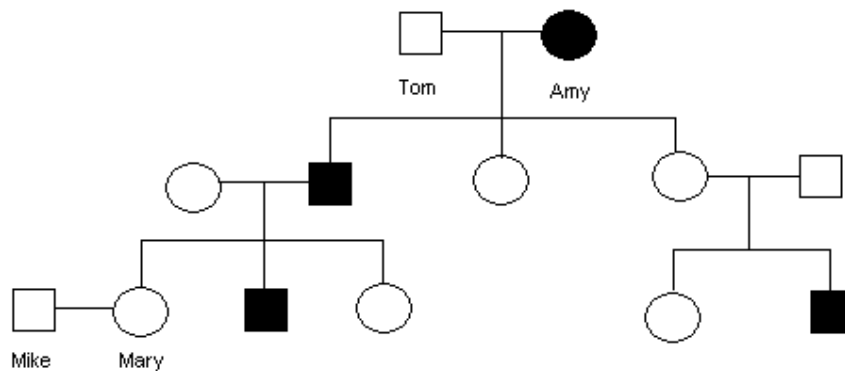
c. What is the genotype for a deaf individual and what is the phenotypic ratio?

d. What is the genotypic ratio of the complete Punnett square? How about the phenotypic ratio?

12. Maria has type O blood and her sister has type AB blood. The girls know that both their maternal grandparents are type A. What are the genotypes of the girls' parents?

13. Following Mendel's laws, what would the phenotypic ratio of a homozygous pea crossed with a heterozygous pea be?

14. Now try a double-heterozygous cross and give the phenotypic ratio.



15. Duchenne Muscular Dystrophy occurs more often in males than in females. Use the chart from above to answer the following questions:

- Is DMD X-linked or Y-linked?
- Is it dominant or recessive?
- What is the genotype of Amy?
- What is the genotype of Mary's father?

E. What is the genotype of Mary's mom?

F. What percentage of Mike's and Mary's boys would have DMD? And of their girls?

16. A homozygous hemophilia female has decided to have children with a normal male. How many of the children will have hemophilia? (Assume 2 boys and 2 girls)

17. What are the nucleic acids that are found in DNA? What about RNA?

18. Given the DNA sequence CTTAATTCGAATTAAG, what is the complementary sequence?

19. Explain what the following enzymes do.

a. DNA helicase

b. DNA ligase

c. DNA polymerase

20. Name the three types of RNA that we discussed in lecture. Which one is responsible for transferring the correct amino acid to the protein being synthesized in translation?

21. tRNA has anticodons to bind to which type of RNA? Draw a picture of what is happening.

22. mRNA has start and stop codons. At what phase of translation are they being utilized, respectively?

23. What is the "Central Dogma"? List the stages at which they are being utilized (ex. Replication).

24. Who is credited with discovering the structure of DNA? Which important female helped make this discovery possible?

25. Match the biotechnology.

a. used for making many copies of DNA fragments.

b. used for learning the order of nucleotide bases in a DNA fragment.

c. used to separate the DNA fragments into bands based on size

d. used for determining gene expression.

Microarray

PCR

DNA sequencing

Gel electrophoresis

26. Restriction enzymes and DNA ligase are important in

a. uracil synthesis

b. unwinding DNA

c. cloning a gene into a plasmid

d. predicting cancers course

27. Add the following (a. through f.) to the beginning of the statement below and decide if the statement would be true or false.

_____ is an application of biotechnology

- a. Cancer research
- b. Drug production
- c. Gene therapy
- d. Natural selection
- e. Improvement of agriculture
- f. Law enforcement crime investigations

28. Fill in the blanks with the appropriate word from the list below.

_____ are undifferentiated making them valuable for research.

_____ are the master controllers that select the location of certain organs in the embryo's development.

stem cells
oncogenes
tumor suppressor genes
homeotic genes

29. When a cell's division becomes unregulated it is known as

- a. angiogenic
- b. invasive
- c. metastatic
- d. overproliferation

30. When blood vessels form, beginning to feed a tumor, the tumor is

- a. angiogenic
- b. invasive
- c. metastatic
- d. overproliferation

31. The stage of cancer that is characterized by tumors spreading to new locations in the body is

- a. angiogenic
- b. invasive
- c. metastatic
- d. overproliferation

32. Pick the reason why radiation treatment for cancer patients has many side effects.

- a. nonspecific
- b. harmful to rapidly dividing cells
- c. harmful to normal tissues
- d. may cause mutations leading to new cancers
- e. all of the above

stay tuned for answers to the review coming tomorrow....

Rosie's Tips For the Test

Read over lecture slides (almost all the answers for this review sheet are there...SWEET!)

Read through Yves test 2 "lecture notes" posted on website- these are the most important highlights from lecture.

Go through the covered chapters and skim the vocab words in bold and their definitions. Make sure you recognize and know the ones that were mentioned in class.

Try to read over the review and the end of each chapter. Again- important highlights. Also, on Yves web page is the test 2 "outline" which mentions some end of chapter questions that are relevant to the test/lectures. Give 'em a try. The answers for these are in the back of the book.

Sleep well, eat good, and call your mother on Sundays.

GOOD LUCK!!!

