

KEY

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

ID: A

### MCC Biology Test 3 2010 Ch 10-15 --Part 1

#### Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- D 1. Energy is released from ATP when
- a. a phosphate group is added.
  - b. adenine bonds to ribose.
  - c. ATP is exposed to sunlight.
  - d. a phosphate group is removed.

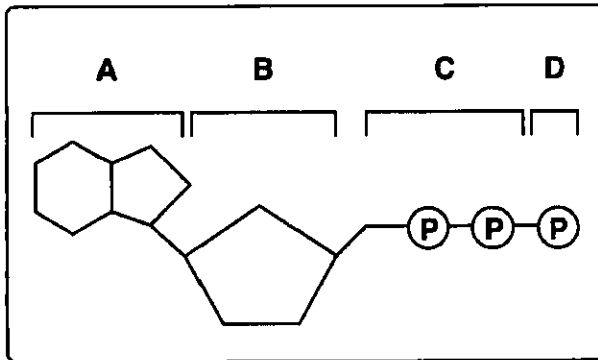


Figure 8-1

- D 2. Look at Figure 8-1. All of the following are parts of an ADP molecule EXCEPT
- a. structure A.
  - b. structure B.
  - c. structure C.
  - d. structure D.
- C 3. Which structures shown in Figure 8-1 make up an ATP molecule?
- a. A and B
  - b. A, B, and C
  - c. A, B, C, and D
  - d. C and D
- D 4. Which of the following are used in the overall reactions for photosynthesis?
- a. carbon dioxide
  - b. water
  - c. light
  - d. all of the above
- A 5. Most plants appear green because chlorophyll
- a. does not absorb green light.
  - b. reflects violet light.
  - c. absorbs green light.
  - d. none of the above
- B 6. A granum is a(an)
- a. stack of chloroplasts.
  - b. stack of thylakoids.
  - c. membrane enclosing a thylakoid.
  - d. photosynthetic pigment molecule.
- D 7. What are the products of the light-dependent reactions?
- a. oxygen gas
  - b. ATP
  - c. NADPH
  - d. all of the above
- B 8. If carbon dioxide is removed from a plant's environment, what would you expect to happen to its production of high-energy sugars?
- a. More sugars will be produced.
  - b. No sugars will be produced.
  - c. The same number of sugars will be produced but without carbon dioxide.
  - d. Carbon dioxide does not affect the production of high-energy sugars in plants.

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- D 9. Plants take in the sun's energy by absorbing
- a. high-energy sugars.
  - b. chlorophyll a.
  - c. chlorophyll b.
  - d. sunlight.
- C 10. What is a product of the Calvin cycle?
- a. oxygen gas
  - b. ATP
  - c. high-energy sugars
  - d. carbon dioxide
- A 11. As a cell becomes larger, its
- a. volume increases faster than its surface area.
  - b. surface area increases faster than its volume.
  - c. volume increases, but its surface area stays the same.
  - d. surface area stays the same, but its volume increases.
- C 12. When during the cell cycle is a cell's DNA replicated?
- a. G1 phase
  - b. G2 phase
  - c. S phase
  - d. M phase
- C 13. During which phase of mitosis do the chromosomes line up along the middle of the dividing cell?
- a. prophase
  - b. telophase
  - c. metaphase
  - d. anaphase
- C 14. Cancer is a disorder in which some cells have lost the ability to control their
- a. size.
  - b. spindle fibers.
  - c. growth rate.
  - d. surface area.

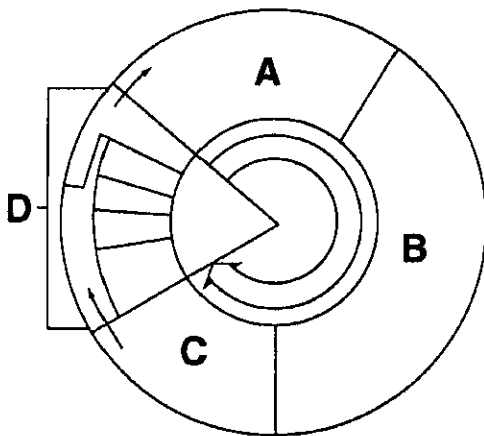


Figure 10-2

- D 15. Cell division is represented in Figure 10-2 by the letter?
- a. A.
  - b. B.
  - c. C.
  - d. D

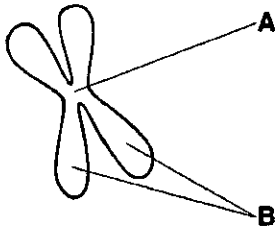


Figure 10-3

- A 16. The structure labeled A in Figure 10-3 is called the
- |                |                      |
|----------------|----------------------|
| a. centromere. | c. sister chromatid. |
| b. centriole.  | d. spindle.          |
- C 17. The structures labeled B in Figure 10-3 are called
- |                 |                       |
|-----------------|-----------------------|
| a. centromeres. | c. sister chromatids. |
| b. centrioles.  | d. spindles.          |
- A 18. The first phase of mitosis is called
- |              |                |
|--------------|----------------|
| a. prophase. | c. metaphase.  |
| b. anaphase. | d. interphase. |
- D 19. Offspring that result from crosses between true-breeding parents with different traits
- |   |                                     |
|---|-------------------------------------|
| a. are true-breeding.                     | c. make up the parental generation. |
| b. make up the F <sub>2</sub> generation. | d. are called hybrids.              |
- C 20. When Mendel crossed true-breeding tall plants with true-breeding short plants, all the offspring were tall because
- |  |
|--|
| a. the allele for tall plants is recessive.    |
| b. the allele for short plants is dominant.    |
| c. the allele for tall plants is dominant.     |
| d. they were true-breeding like their parents. |
- A 21. How many different allele combinations would be found in the gametes produced by a pea plant whose genotype was RrYY?
- |      |       |
|------|-------|
| a. 2 | c. 8  |
| b. 4 | d. 16 |
- B 22. If an organism's diploid number is 12, its haploid number is
- |        |        |
|--------|--------|
| a. 12. | c. 24. |
| b. 6.  | d. 3.  |

C 23. What is shown in Figure 11-1?

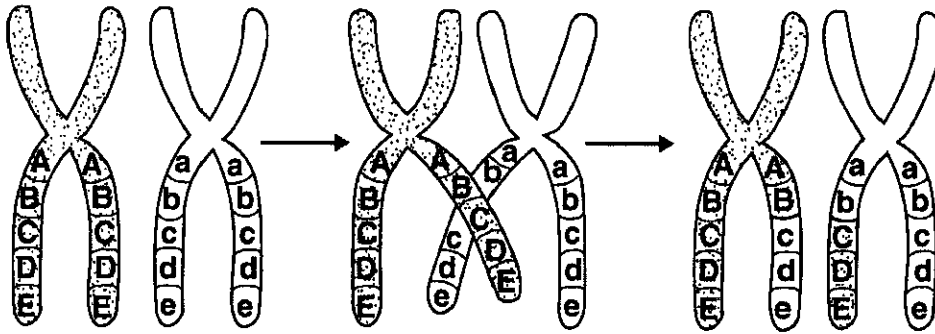


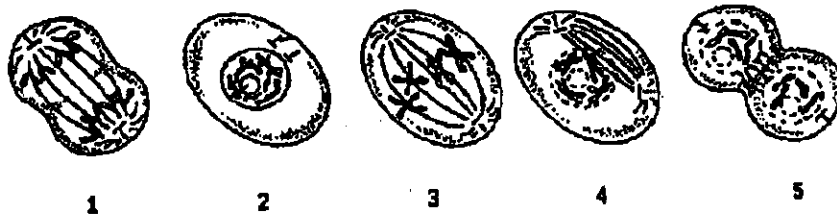
Figure 11-1

- a. independent assortment  
b. anaphase I of meiosis  
c. crossing-over  
d. incomplete dominance
- A 24. Chromosomes form tetrads during  
a. prophase of meiosis I.  
b. metaphase of meiosis I.  
c. prophase of meiosis II.  
d. metaphase of meiosis II.
- B 25. Unlike mitosis, meiosis results in the formation of  
a. two genetically identical diploid cells.  
b. four genetically different haploid cells.  
c. four genetically identical haploid cells.  
d. two genetically different diploid cells.
- C 26. What are Mendel's factors called today?  
a. alleles  
b. traits  
c. genes  
d. characters
- C 27. The principle of dominance states that  
a. all alleles are dominant.  
b. all alleles are recessive.  
c. some alleles are dominant and others are recessive.  
d. alleles are neither dominant nor recessive.
- D 28. When Mendel allowed the tall F1 pea plants (Tt) to self-pollinate,  
a. the offspring were of medium height.  
b. all of the offspring were tall.  
c. all of the offspring were short.  
d. some of the offspring were short.
- B 29. Organisms that have two identical alleles for a particular trait are said to be  
a. hybrid.  
b. homozygous.  
c. heterozygous.  
d. dominant.
- B 30. Situations in which one allele for a gene is not completely dominant over another allele for that gene are called  
a. multiple alleles.  
b. incomplete dominance.  
c. codominant alleles.  
d. multiple genes.

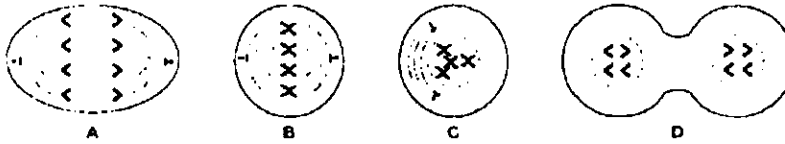
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- B 31. Gametes are produced by the process of  
a. mitosis. c. crossing-over.  
b. meiosis. d. replication.
- B 32. The source of oxygen produced during photosynthesis is  
a. carbon dioxide. c. the air.  
b. water. d. glucose.
- B 33. Electrons that have been excited by light energy absorbed by a chlorophyll molecule  
a. attach to two protons and an oxygen atom to form a water molecule.  
b. jump to molecules in the membrane of the thylakoid.  
c. are absorbed to the interior of a thylakoid.  
d. are transformed to protons by a proton pump.
- B 34. Homologous chromosomes are pairs of chromosomes containing genes that code for  
a. different traits. c. DNA.  
b. the same traits. d. cytosol.
- B 35. In humans, the male determines the sex of the child because males have  
a. two X chromosomes. c. two Y chromosomes.  
b. one X and one Y chromosome. d. 46 chromosomes.
- C 36. The X and Y chromosomes are called the  
a. extra chromosomes. c. sex chromosomes.  
b. phenotypes. d. All of the above
- C 37. The diploid number of chromosomes in a human skin cell is 46. The number of chromosomes found in a human ovum is  
a. 46. c. 23.  
b. 92. d. 12.5.
- A 38. The synthesis (S) phase is characterized by  
a. DNA replication.  
b. cell division.  
c. replication of mitochondria and other organelles.  
d. the division of cytoplasm.

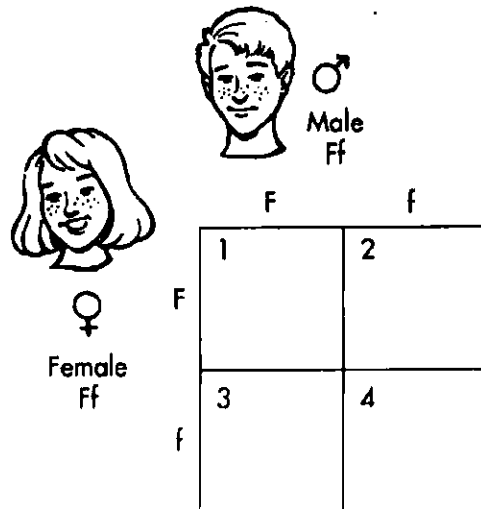


- C 39. Refer to the illustration above. The cell in diagram 1 is in  
a. metaphase. c. anaphase.  
b. telophase. d. prophase.
- B 40. Refer to the illustration above. The cell shown in diagram 5 is in  
a. metaphase. c. anaphase.  
b. telophase. d. prophase.



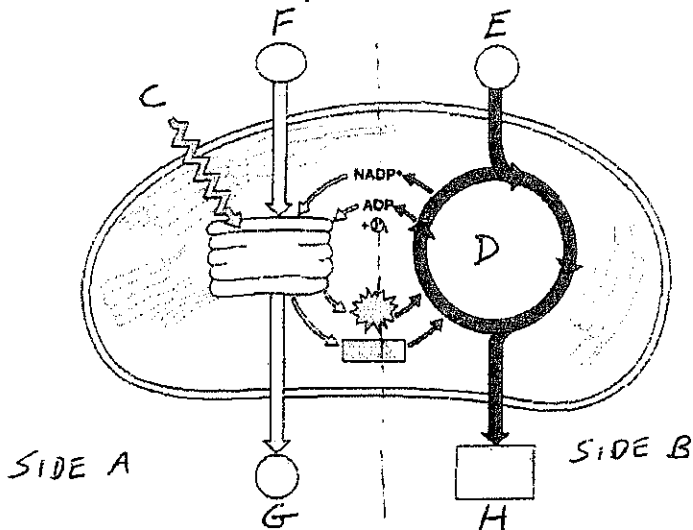
- B 41. Refer to the illustration above. Which of the following correctly indicates the order in which these events occur?
- |               |               |
|---------------|---------------|
| a. A, B, C, D | c. B, A, C, D |
| b. C, B, A, D | d. A, C, B, D |
- C 42. Crossing-over occurs
- |                          |                       |
|--------------------------|-----------------------|
| a. during prophase 2.    | c. during prophase I. |
| b. during fertilization. | d. at the centromere. |
- D 43. Mendel's law of segregation states that
- pairs of alleles are dependent on one another when separation occurs during gamete formation.
  - pairs of alleles separate independently of one another after gamete formation.
  - each pair of alleles remains together when gametes are formed.
  - the two alleles for a trait separate when gametes are formed.
- B 44. The phenotype of an organism
- represents its genetic composition.
  - is the physical appearance of a trait.
  - occurs only in dominant pure organisms.
  - cannot be seen.

In humans, having freckles (F) is dominant to not having freckles (f). The inheritance of these traits can be studied using a Punnett square similar to the one shown below.



- A 45. Refer to the illustration above. The child represented in box 1 in the Punnett square would
- be homozygous for freckles.
  - have an extra freckles chromosome.
  - be heterozygous for freckles.
  - not have freckles.
- D 46. Refer to the illustration above. Which box in the Punnett square represents a child who does *not* have freckles?
- box 1
  - box 2
  - box 3
  - box 4
- D 47. The unknown genotype of an individual with a dominant phenotype can be determined using
- a ratio.
  - a dihybrid cross.
  - probability
  - a test cross.
- A 48. If a characteristic is sex-linked, it
- occurs most commonly in males.
  - occurs only in females.
  - can never occur in females.
  - is always fatal.
- A 49. When a nitrogen base becomes bonded to a sugar (ribose or deoxyribose) that is bonded to a phosphate, the resulting molecule is called a(n)
- nucleotide.
  - amino acid.
  - bacteriophage.
  - enzyme.
- B 50. The person(s) responsible for determining the shape and structure of the DNA molecule is (are)
- Griffith.
  - Watson and Crick.
  - Avery.
  - Franklin and Wilkins.

Directions: Use the diagram below to answer the questions that follow.



1. What is the overall process being shown in the diagram above? PHOTOSYNTHESIS
2. What is the name of the organelle shown in the diagram above? CHLOROPLAST
3. What does the jagged arrow at C represent? SUN LIGHT
4. Side A represents: Light Reactions; ~~Dark Reactions~~ (Circle the correct answer)
5. Side B represents: Light Reactions; ~~Dark Reactions~~ (Circle the correct answer)
6. What is the name of the cycle shown at D CALVIN CYCLE
7. What is the gas entering at E CO<sub>2</sub>
8. Complete the punnett square and answer all of the questions below. (7 points)

The physical appearance of an individual is its phenotype, while the genetic makeup of an individual is its genotype

Use a Punnett square to show the offspring of a cross between two pea plants that are heterozygous for stem length (Tt x Tt). Give the phenotypes and genotypes of the offspring.

	T	t
T	TT	Tt
t	Tt	tt

Phenotypes: 3 tall · 1 short

Genotypes: 1 TT  
2 Tt  
1 tt

9. Electron transport chains are used to produce what energy molecule? ATP
10. What are the 4 bases of the DNA molecule? A C G T

BONUS on the Back\*\*\*\* BONUS on the Back\*\*\*\* BONUS on the Back\*\*\*\* BONUS on the Back

BONUS: Complete the problem below for a 5 point bonus. Your answer must give all of the possible phenotypes and the percentage of each phenotype produced in order to get the points.

b. Fill in the Punnett square below. Give the phenotypes of the offspring of this cross and the percentage of each phenotype produced.

	RY	Ry	rY	ry
RY	RRYY	RRYy	RrYY	RrYy
Ry	RRYy	RRyy	RrYy	Rryy
rY	RrYY	RrYy	rrYY	rrYy
ry	RrYy	Rryy	rrYy	rryy

$\frac{9}{16}$  Round Yellow  $R\_ Y\_$   
 $\frac{3}{16}$  Round green  $R\_ yy$   
 $\frac{3}{16}$  wrinkled yellow  $rr Y\_$   
 $\frac{1}{16}$  wrinkled green  $rryy$