Chapter 02
Reproduction and Chromosome Transmission

Check All That Apply Questions

1.

Select traits associated with prokaryotic cells. Check all that apply.

__X__

Genetic information is contained within a nucleoid region.

__X__

Genetic material is organized as a single circular chromosome.

__X__

They have a cell wall surrounding their plasma membrane.

_____

They have membrane-bound organelles in their cytoplasm.

Bloom's Level: 2. Understand
Learning Outcome: 02.01.02 Outline key differences between prokaryotic and eukaryotic cells.
Section: 02.01
Topic: General Features of Chromosomes

Multiple Choice Questions

2.

Cytokinesis in animals occurs through the formation of a _____, whereas in plants a _____ forms.

A.

cleavage furrow; cell plate

B.

cell plate; cleavage furrow

C.

cleavage furrow; kinetochore

D.

kinetochore; cell plate

Bloom's Level: 1. Remember
Learning Outcome: 02.03.03 Outline the key differences between cytokinesis in animal and plant cells.
Section: 02.03
Topic: Mitosis and Cytokinesis

Check All That Apply Questions

3.

Select the cells that are eukaryotic. Check all that apply.

_____

bacteria

__X__

fungi

__X__

protists

__X__

plants

__X__

animals

Bloom's Level: 2. Understand
Learning Outcome: 02.01.02 Outline key differences between prokaryotic and eukaryotic cells.
Section: 02.01
Topic: General Features of Chromosomes

Multiple Choice Questions

4. Organelles are _____.
A. structures that contain the genetic material
B. membrane-bound compartments of eukaryotic cells
C. the region that contains the DNA in prokaryotic cells
D. the outer, rigid covering of a prokaryotic cell

Bloom's Level: 2. Understand
Learning Outcome: 02.01.02 Outline key differences between prokaryotic and eukaryotic cells.
Section: 02.01
Topic: General Features of Chromosomes

5. A cytogeneticist would primarily do which of the following?
A.

study the distribution of traits in a population

B.

study the evolutionary changes in a specific trait

C.

use a karyotype analysis to examination chromosomal structure

D.

determine the genetic sequence of a specific gene

Bloom's Level: 2. Understand
Learning Outcome: 02.01.03 Describe the procedure for making a karyotype.
Section: 02.01
Topic: General Features of Chromosomes

6. A karyotype is a(n) _____.
A. organelle of eukaryotic cells
B. stage of prophase I in meiosis
C. division of the cytoplasmic material following mitosis
D. photographic representation of the chromosomes of a cell

Bloom's Level: 2. Understand
Learning Outcome: 02.01.03 Describe the procedure for making a karyotype.
Section: 02.01
Topic: General Features of Chromosomes

7. During sexual reproduction, each parent contributes one set of chromosomes. Similar chromosomes from each parent are called _____.
A. karyotypes
B. sister chromatids
C. homologs
D. sex chromosomes

Bloom's Level: 2. Understand
Learning Outcome: 02.01.04 Compare and contrast the similiarities and differences between homologous chromosomes.
Section: 02.01
Topic: General Features of Chromosomes

8. Which of the following would contain genetic material that is 100% identical?
A.

homologous chromosomes

B.

sister chromatids

C. X and Y chromosomes
D.

All of these choices are identical.

Bloom's Level: 2. Understand
Learning Outcome: 02.01.04 Compare and contrast the similiarities and differences between homologous chromosomes.
Section: 02.01
Topic: General Features of Chromosomes

9. The location of a gene on a chromosome is called its _____.
A. karyotype
B. allele
C.

locus

D.

homolog

Bloom's Level: 1. Remember
Learning Outcome: 02.01.04 Compare and contrast the similiarities and differences between homologous chromosomes.
Section: 02.01
Topic: General Features of Chromosomes

10. Cell division in prokaryotic cells is called _____, while in eukaryotic cells it is called _____.
A. binary fission ; binary fission
B. binary fission ; mitosis
C. mitosis ; mitosis
D. mitosis ; binary fission

Bloom's Level: 1. Remember
Learning Outcome: 02.02.01 Describe the process of binary fission in bacteria.
Learning Outcome: 02.02.02 List and outline the phases of the eukaryotic cell cycle.
Section: 02.02
Topic: Cell Division

11. The process of binary fission is primarily used for asexual reproduction in _____.

A. prokaryotes
B. eukaryotes

Bloom's Level: 2. Understand
Learning Outcome: 02.02.01 Describe the process of binary fission in bacteria.
Section: 02.02
Topic: Cell Division

12. During this phase of the cell cycle, the sister chromatids are formed.
A. G_1 phase
B. G_2 phase
C. S phase
D. Prophase
E. Cytokinesis

Bloom's Level: 2. Understand
Learning Outcome: 02.02.02 List and outline the phases of the eukaryotic cell cycle.
Section: 02.02
Topic: Cell Division

Check All That Apply Questions

13.

Select the phases that are part of interphase. Check all that apply.

__X__

G_1 phase

__X__

G_2 phase

__X__

S phase

_____

Metaphase

Bloom's Level: 2. Understand
Learning Outcome: 02.02.02 List and outline the phases of the eukaryotic cell cycle.
Section: 02.02
Topic: Cell Division

14.

Select the characteristics that are true of restriction points. Check all that apply.

__X__

An example is the boundary between G_1 and S phase.

__X__

In many cases molecular changes must be present at this point for the cell to continue through the cell cycle.

__X__

Cells passing this point are committed to the next stage of the cell cycle.

____

Cells passing this point can reverse to an earlier phase of the cell cycle.

Bloom's Level: 2. Understand
Learning Outcome: 02.02.02 List and outline the phases of the eukaryotic cell cycle.
Section: 02.02
Topic: Cell Division

Multiple Choice Questions

15.

Select the phase when chromosomes start to condense.

A. Metaphase
B. Prometaphase
C. Telophase
D. Anaphase
E. Prophase

Bloom's Level: 1. Remember
Learning Outcome: 02.03.02 List and describe the phases of mitosis.
Section: 02.03
Topic: Mitosis and Cytokinesis

16.

Select the phase when sister chromatids separate and head towards opposite poles of the cell.

A. Metaphase
B. Prometaphase
C. Telophase
D. Anaphase
E. Prophase

Bloom's Level: 1. Remember
Learning Outcome: 02.03.02 List and describe the phases of mitosis.
Section: 02.03
Topic: Mitosis and Cytokinesis

17.

Select the phase during which the centrosomes move to opposite poles of the cell.

A. Metaphase
B. Prometaphase
C. Telophase
D. Anaphase
E. Prophase

Bloom's Level: 1. Remember
Learning Outcome: 02.03.02 List and describe the phases of mitosis.
Section: 02.03
Topic: Mitosis and Cytokinesis

18.

Select the phase when the chromosomes line up in the center of the cell.

A. Metaphase
B. Prometaphase
C. Telophase
D. Anaphase
E. Prophase

Bloom's Level: 1. Remember
Learning Outcome: 02.03.02 List and describe the phases of mitosis.
Section: 02.03
Topic: Mitosis and Cytokinesis

19.

Select the phase when the nuclear membrane starts to disassociate.

A. Metaphase
B. Prometaphase
C. Telophase
D. Anaphase
E. Prophase

Bloom's Level: 1. Remember
Learning Outcome: 02.03.02 List and describe the phases of mitosis.
Section: 02.03
Topic: Mitosis and Cytokinesis

20.

Select the phase when the nuclear membrane reforms around the chromosomes.

A. Metaphase
B. Prometaphase
C. Telophase
D. Anaphase
E. Prophase

Bloom's Level: 1. Remember
Learning Outcome: 02.03.02 List and describe the phases of mitosis.
Section: 02.03
Topic: Mitosis and Cytokinesis

21.

Select the phase when the microtubules of the spindle fiber attach to the kinetochore.

A. Metaphase
B. Prometaphase
C. Telophase
D. Anaphase
E. Prophase

Bloom's Level: 1. Remember
Learning Outcome: 02.03.02 List and describe the phases of mitosis.
Section: 02.03
Topic: Mitosis and Cytokinesis

22.

Select the phase when the separated sister chromatids are considered independent chromosomes.

A. Metaphase
B. Prometaphase
C. Telophase
D. Anaphase
E. Prophase

Bloom's Level: 1. Remember
Learning Outcome: 02.03.02 List and describe the phases of mitosis.
Section: 02.03
Topic: Mitosis and Cytokinesis

23. Which of the following indicates the correct order of these events?

A. Anaphase - Telophase - Prophase - Prometaphase - Metaphase
B. Telophase - Prometaphase - Prophase - Metaphase - Anaphase
C. Metaphase - Prometaphase - Prophase - Anaphase - Telophase
D. Prophase - Prometaphase - Metaphase - Anaphase - Telophase

Bloom's Level: 1. Remember
Learning Outcome: 02.03.02 List and describe the phases of mitosis.
Section: 02.03
Topic: Mitosis and Cytokinesis

24.

In animals, somatic cells are _____ and gametes are _____.

A. diploid ; diploid
B. diploid ; haploid
C. haploid ; diploid
D. haploid ; haploid

Bloom's Level: 1. Remember
Learning Outcome: 02.05.02 Describe how animals make sperm and egg cells.
Section: 02.05
Topic: Sexual Reproduction

25. If the gametes of an organism are different morphologically, they are said to be _____.
A. isogamous
B. heterogamous
C. diploid
D. haploid

Bloom's Level: 1. Remember
Learning Outcome: 02.05.02 Describe how animals make sperm and egg cells.
Section: 02.05
Topic: Sexual Reproduction

26. The general purpose of the synaptonemal complex is to _____.
A. provide a link between homologous chromosomes in meiosis
B. enable the reformation of the cell wall during cytokinesis
C. separate the sister chromatids during anaphase
D. independently assort the chromosomes during metaphase of meiosis

Bloom's Level: 2. Understand
Learning Outcome: 02.04.01 List and describe the phases of meiosis.
Section: 02.04
Topic: Meiosis

27. Which of the following occurs during leptotene of prophase I?

A.

The homologous chromosomes recognize one another by synapsis.

B.

Crossing over occurs.

C.

The replicated chromosomes condense.

D.

The synaptonemal complex dissociates.

Bloom's Level: 1. Remember
Learning Outcome: 02.04.01 List and describe the phases of meiosis.
Section: 02.04
Topic: Meiosis

28. A bivalent contains how many sister chromatids?

A. 2
B. 4
C. 8
D.

depends on the cell

Bloom's Level: 2. Understand
Learning Outcome: 02.04.01 List and describe the phases of meiosis.
Section: 02.04
Topic: Meiosis

29. The process of crossing over occurs during which of the following?

A.

diakinesis

B.

diplotene

C.

pachytene

D.

zygotene

E.

leptotene

Bloom's Level: 1. Remember
Learning Outcome: 02.04.01 List and describe the phases of meiosis.
Section: 02.04
Topic: Meiosis

30. The bivalent structure forms during which of the following?
A.

leptotene

B.

zygotene

C.

pachytene

D.

diplotene

E.

diakinesis

Bloom's Level: 1. Remember
Learning Outcome: 02.04.01 List and describe the phases of meiosis.
Section: 02.04
Topic: Meiosis

31. Which of the following represents the correct order of events during prophase I?
A. Pachytene - diplotene - diakinesis - leptotene - zygotene
B. Leptotene - zygotene - pachytene - diplotene - diakinesis
C.

zygotene - leptotene - pachytene - diakinesis - diplotene

D. Diplotene - pachytene - leptotene - diakinesis - zygotene

Bloom's Level: 1. Remember
Learning Outcome: 02.04.01 List and describe the phases of meiosis.
Section: 02.04
Topic: Meiosis

32.

The physical structure that is formed when two chromatids cross over is called a(n) _____.

A. synaptomenal complex
B. bivalent
C. karyotype
D. chiasma

Bloom's Level: 1. Remember
Learning Outcome: 02.04.01 List and describe the phases of meiosis.
Section: 02.04
Topic: Meiosis

33. If an organism has five pairs of chromosomes, how many chromosomal combinations are possible at metaphase I of meiosis?
A. 5^2
B. 10^5
C. 5^{10}
D. 2^5

Bloom's Level: 4. Analyze
Learning Outcome: 02.04.01 List and describe the phases of meiosis.
Section: 02.04
Topic: Meiosis

34. The end result of meiosis in animals is _____.
A. two diploid cells
B. two haploid cells
C. four diploid cells
D. four haploid cells

Bloom's Level: 2. Understand
Learning Outcome: 02.04.01 List and describe the phases of meiosis.
Section: 02.04
Topic: Meiosis

35. The process of meiosis II is similar to that of _____.
A. mitosis
B. binary fission
C. meiosis I

Bloom's Level: 2. Understand
Learning Outcome: 02.04.02 Compare and contrast the key differences between mitosis and meiosis.
Section: 02.04
Topic: Meiosis

36.

Oogenesis is a gametogenic process in which cells undergo _____ to produce _____.

A. binary fission ; sperm cells
B. mitosis ; egg cells
C. meiosis ; egg cells
D. meiosis ; sperm cells
E. mitosis ; sperm cells

Bloom's Level: 2. Understand
Learning Outcome: 02.05.02 Describe how animals make sperm and egg cells.
Section: 02.05
Topic: Sexual Reproduction

37. In plants, the haploid generation is called the _____ and the diploid generation is called the _____.
A. sporophyte ; spermatogenesis
B. gametophyte ; sporophyte
C. sporophyte ; gametophyte
D. oogenesis ; gametophyte

Bloom's Level: 1. Remember
Learning Outcome: 02.05.03 Explain how plants alternate beween haploid and diploid generations.
Section: 02.05
Topic: Sexual Reproduction

38. In plants, spores are produced by the process of _____.
A. spermatogenesis
B. meiosis
C. mitosis
D. binary fission
E. oogenesis

Bloom's Level: 1. Remember
Learning Outcome: 02.05.03 Explain how plants alternate beween haploid and diploid generations.
Section: 02.05
Topic: Sexual Reproduction

39.

A pollen grain in a plant represents the _____.

A. male gametophyte
B. female gametophyte
C. male sporophyte
D. female sporophyte

Bloom's Level: 2. Understand
Learning Outcome: 02.05.03 Explain how plants alternate beween haploid and diploid generations.
Section: 02.05
Topic: Sexual Reproduction

40.

Which type of microtubule is paired to its correct function?

A.

polar microtubules - attach to the kinetochore

B.

aster microtubules - position the spindle apparatus

C.

kinetochore microtubules - separate the poles

Bloom's Level: 2. Understand
Learning Outcome: 02.03.01 Describe the structure and function of the mitotic spindle.
Section: 02.03
Topic: Mitosis and Cytokinesis

41.

During sexual reproduction, gametes are made that contain _____ amount of genetic material as a somatic cell in the organism.

A.

twice the

B.

half the

C.

the same

D.

a quarter of the

Bloom's Level: 1. Remember
Learning Outcome: 02.05.01 Define sexual reproduction.
Section: 02.05
Topic: Sexual Reproduction

Chapter 02 - Reproduction and Chromosome Transmission

42.

Genes are physically located within _____.

A.

chromosomes

B.

centrosomes

C.

kinetochores

D.

microtubules

Bloom's Level: 1. Remember
Learning Outcome: 02.01.01 Define the term chromosome.
Section: 02.01
Topic: General Features of Chromosomes