

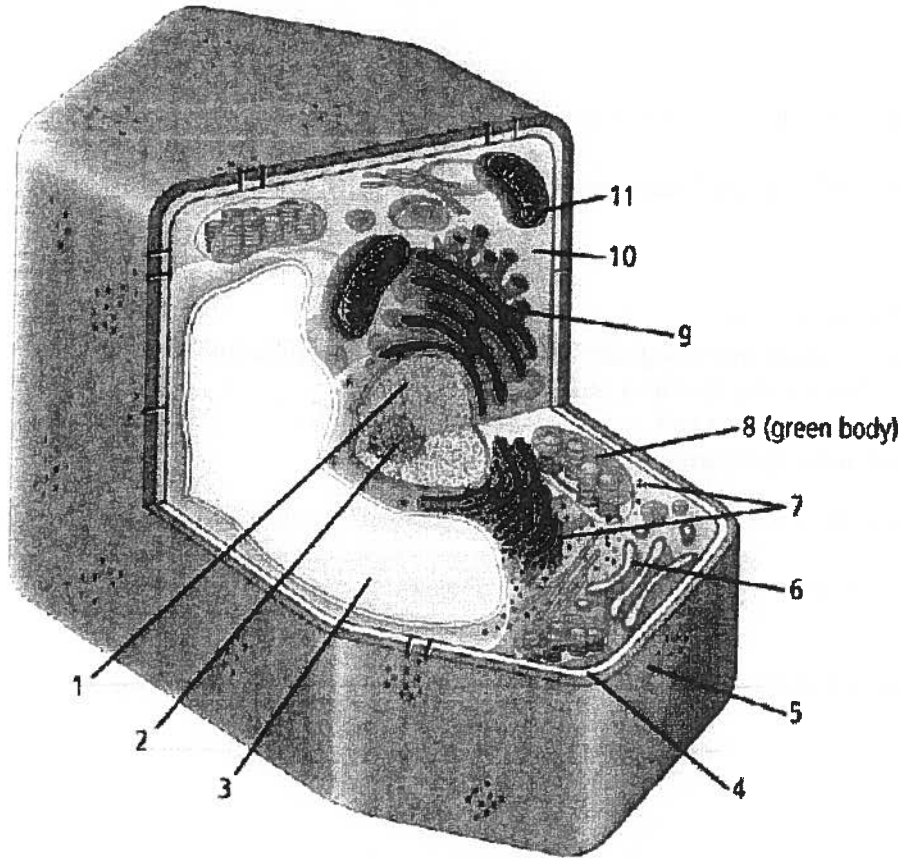
Science 9 Pretest Reproduction

Multiple Choice

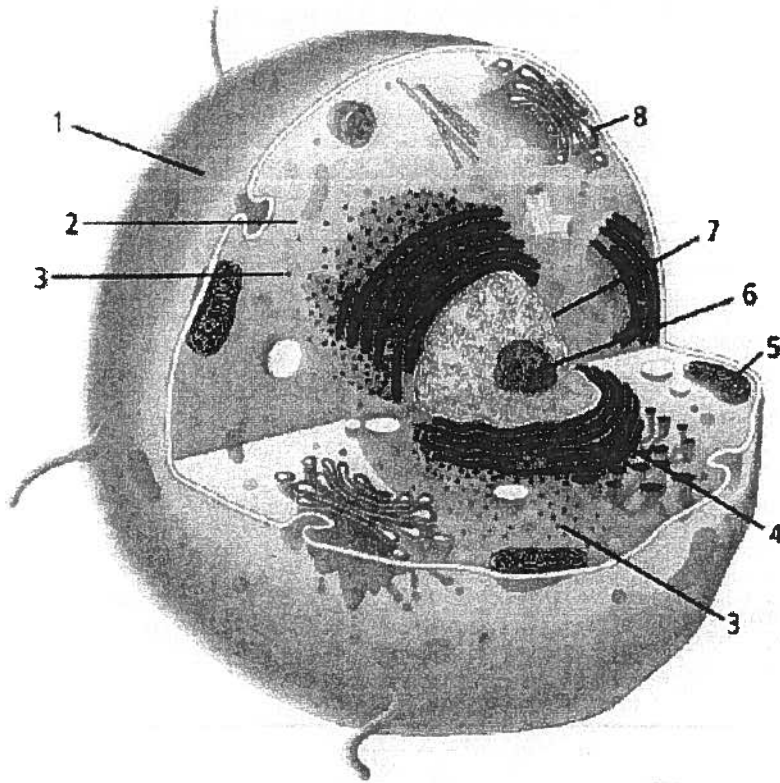
Identify the choice that best completes the statement or answers the question.

- _____ 1. In the DNA molecule, the nitrogen bases are always found in pairs. The base A pairs with
- a. the base C.
 - b. the base T.
 - c. the base G.
 - d. another base A.
- _____ 2. The "genetic code" is made up of
- a. the arrangement of sugar and phosphate groups along the DNA molecule.
 - b. the sequence of bases along the DNA molecule.
 - c. the pairs of chromosomes in a cell.
 - d. the proteins that make up a particular stretch of DNA.
- _____ 3. The organelle that could be called the "cellular subway" because it is a network of channels throughout the cell is the
- a. endoplasmic reticulum.
 - b. nucleus.
 - c. ribosomes.
 - d. vacuoles.
- _____ 4. Where in the cell are the chromosomes located?
- a. chloroplasts
 - b. Golgi bodies
 - c. nucleus
 - d. vacuoles

Plant Cell



- _____ 5. The endoplasmic reticulum is labelled on the diagram of the plant cell shown above. It is labelled as part number
- | | |
|-------|--------|
| a. 1. | c. 9. |
| b. 2. | d. 11. |
- _____ 6. The cytoplasm is labelled on the diagram of the plant cell shown above as part number
- | | |
|-------|--------|
| a. 3. | c. 5. |
| b. 4. | d. 10. |
- _____ 7. Part number 2 in the diagram of the green plant cell is responsible for making ribosomes. It is called the
- | | |
|----------------|-------------|
| a. Golgi body. | c. nucleus. |
| b. nucleolus. | d. vesicle. |
- _____ 8. Part number 6 in the animal cell shown above is a membrane-free organelle responsible for making ribosomes. It is called the
- | | |
|-------------------|-------------|
| a. mitochondrion. | c. nucleus. |
| b. nucleolus. | d. vesicle. |



- ___ 9. Part number 3 in the animal cell shown above is found throughout the cell and is called the
- | | |
|-------------------|--------------|
| a. cytoplasm. | c. ribosome. |
| b. mitochondrion. | d. vesicle. |
- ___ 10. The specialized proteins that speed up chemical reactions are called
- | | |
|--------------|---------------|
| a. bacteria. | c. racers. |
| b. enzymes. | d. ribosomes. |
- ___ 11. A neutral mutation
- does not affect the organism.
 - never happens since all mutations affect an individual.
 - cannot be transmitted to the next generation.
 - will not be seen until two or three generations have been produced.
- ___ 12. When a cell is preparing to reproduce, the chromatin in the nucleus forms into
- | | |
|---------------------------|----------------------|
| a. chromosomes. | c. genes. |
| b. deoxyribonucleic acid. | d. ribonucleic acid. |
- ___ 13. The normal human cell carries
- | | |
|-----------------------------|-------------------------------|
| a. 23 separate chromosomes. | c. 46 individual chromosomes. |
| b. 23 pairs of chromosomes. | d. 46 pairs of chromosomes. |
- ___ 14. One side of a gene segment is composed of the following bases: GTCAACGTAGAT. What would the bases on the other side of the ladder be?
- | | |
|-----------------|-----------------|
| a. ACTGGTACGAGC | c. TGACCATGCTCG |
| b. GTCAACGTAGAT | d. CAGTTGCATCTA |

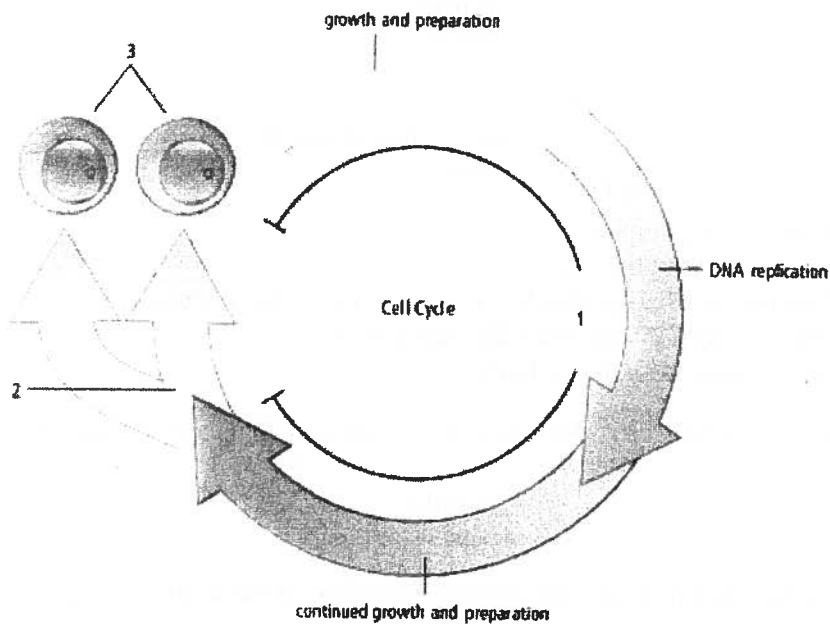
- _____ 15. All the genetic information stored within the chromosomes of a living cell is referred to as the
- gene sequences.
 - genetic code.
 - genome.
 - hereditary information.
- _____ 16. A protein that acts as a chemical messenger could be a
- catalyst.
 - hormone.
 - messenger protein.
 - transcriber protein.
- _____ 17. A specific protein is produced when
- an RNA molecule brings the instructions to a ribosome.
 - a DNA molecule brings a chemical message to a ribosome.
 - a DNA molecule brings a chemical message to a Golgi body.
 - a vesicle receives a chemical message from the endoplasmic reticulum.
- _____ 18. When a gene mutation occurs
- one of the bases is left out of the sequence.
 - one of the bases is substituted for another.
 - a new base is added to the sequence.
 - any of the above could have occurred.
- _____ 19. Treatment for mutations that alter the genes is called
- gene correction.
 - gene therapy.
 - genetic manipulation.
 - genetic surgery.
- _____ 20. When mutations are corrected by inserting healthy genes, the result is
- the correct proteins are produced.
 - the cell reproduces the new genetic material.
 - healthy genes are inserted into the chromosomes.
 - all of the above occur.
- _____ 21. Which of the following best describes binary fission?
- A form of asexual reproduction in which spores are created
 - The transfer of genetic material directly from one cell to another
 - The fusing together of two cells to form one
 - A form of asexual reproduction through cell division
- _____ 22. When an organism undergoes binary fission,
- many offspring may be produced.
 - each of the offspring is identical to the parent organism.
 - each new cell has half of the genetic material of the parent.
 - the result is genetic recombination but not reproduction.
- _____ 23. Where in the cell are the chromosomes located?
- chloroplasts
 - cytoplasm
 - nucleus
 - vacuoles
- _____ 24. The nucleus of every cell contains deoxyribonucleic acid, which is also known as
- DNA.
 - DRA.
 - RNA.
 - RNL.

- _____ 25. New body cells (e.g., skin, muscle) are produced by
- a. eggs.
 - b. fertilization.
 - c. meiosis.
 - d. mitosis.
- _____ 26. Mitosis produces a(n)
- a. egg.
 - b. gamete.
 - c. pair of identical cells.
 - d. sperm.
- _____ 27. Asexual reproduction is a process that requires
- a. only one parent, and produces many offspring, all different.
 - b. only one parent, and produces offspring identical to or very much like the parent.
 - c. two parents, and produces offspring very much like the parents.
 - d. two parents, and produces many offspring, all different.
- _____ 28. A process by which one or more genetically identical copies of an individual are produced from a single cell is called
- a. cloning.
 - b. cutting.
 - c. grafting.
 - d. using a scion.
- _____ 29. A hydra is a microscopic animal that produces offspring by budding. What would you expect to see if you observed one reproducing?
- a. The hydra splits lengthwise to make two identical animals that separate.
 - b. Some cells of the body wall divide, forming a bulge that grows into a new hydra, which then splits apart from the parent.
 - c. The hydra splits crosswise, and both its head and its tail grow into whole animals.
 - d. An injury breaks off a little piece of the hydra that grows into a whole animal.
- _____ 30. Which of the following is true of asexual reproduction?
- a. It requires two parents.
 - b. It applies only to single-celled animals.
 - c. The offspring are genetically identical to the parent.
 - d. The offspring have half as many chromosomes as the parent.
- _____ 31. When a smaller version of an organism grows from cells in the original organism, the process is called
- a. binary fission.
 - b. budding.
 - c. fragmentation.
 - d. fusion.
- _____ 32. A process whereby new plants grow from broken plant pieces is called
- a. cloning.
 - b. grafting.
 - c. meiosis.
 - d. vegetative reproduction.

Name: _____

ID: A

___ 33. The process in stage 3 in the cell cycle diagram below shows the process of

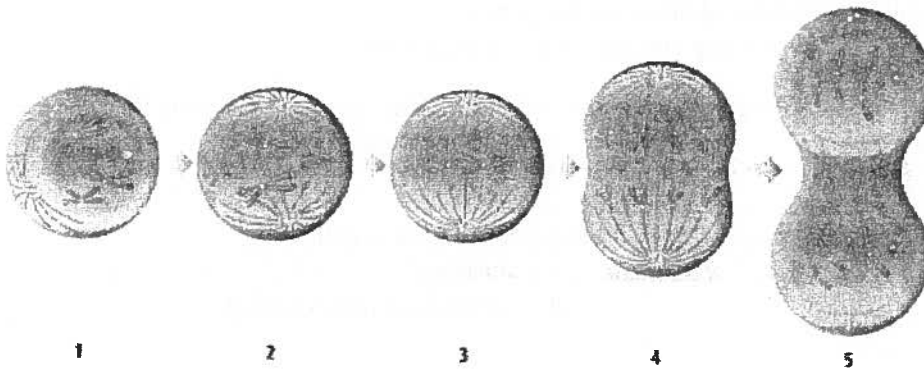


- a. cytokinesis.
- b. interphase.
- c. mitosis.
- d. replication.

___ 34. The stage of mitosis during which the nucleolus and nuclear membrane disappear is

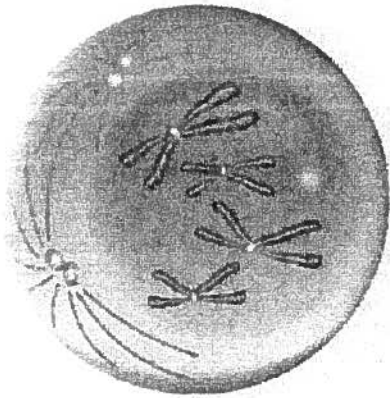
- a. anaphase.
- b. early prophase.
- c. late prophase.
- d. metaphase.

___ 35. The diagram below shows



- a. the cell cycle.
- b. meiosis.
- c. the steps of metaphase.
- d. mitosis.

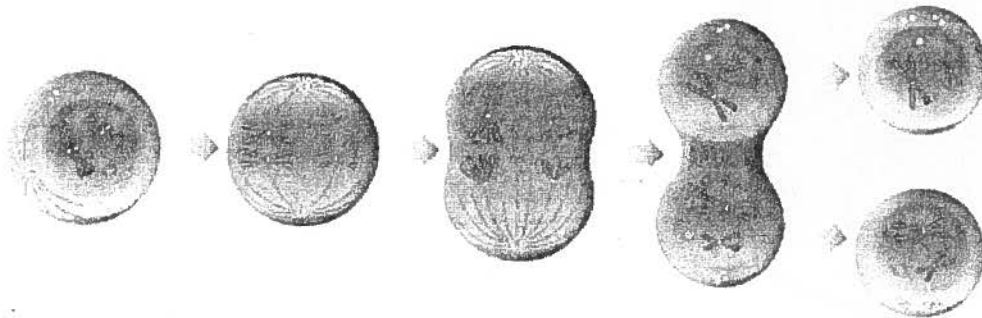
- ___ 36. While looking through a microscope you observe the following:



What is the name of this stage of the cell cycle?

- a. anaphase
b. early prophase
c. late prophase
d. telophase
- ___ 37. During the development of an embryo, cells are able to divide many times until they become specialized. The embryo cells are called
- a. baby cells.
b. embryonic specialized cells.
c. embryonic stem cells.
d. therapeutic stem cells.
- ___ 38. The tiny tube-like structures, which are made of proteins and are found in the cell during mitosis, are
- a. centrioles.
b. centromeres.
c. chromatids.
d. spindle fibres.
- ___ 39. Cell cycle control may be lost if
- a. specialized cells form during the cell cycle.
b. a mutation occurs in the gene producing checkpoint proteins.
c. the cells grow in a single layer.
d. the cell is exposed to a small amount of fluorescent light.
- ___ 40. When a piece of an organism is broken off and develops into a new organism, the process is referred to as
- a. binary fission.
b. budding.
c. fragmentation.
d. vegetative reproduction.
- ___ 41. A specialized cell that grows into a new individual by means of mitosis is called a
- a. clone.
b. cutting.
c. seed.
d. spore.
- ___ 42. Cells that can develop into any type of cells found in the human body are called
- a. baby cells.
b. clones.
c. embryonic stem cells.
d. specialty cells.
- ___ 43. Each inherited characteristic is determined by genes passed on from
- a. the mother and her parents.
b. the father and his parents.
c. the father and mother.
d. the mother only.

- ___ 44. In which part of the flower structure are seeds formed?
- | | |
|----------------|-----------|
| a. stigma | c. anther |
| b. pollen tube | d. ovary |



- ___ 45. Which process is shown in the illustration above?
- | | |
|------------------------|------------|
| a. fertilization | c. meiosis |
| b. genetic engineering | d. mitosis |
- ___ 46. Which of the following is a source of variation in sexual reproduction?
- The random division of chromosome pairs into gametes
 - The duplication of genetic material before mitosis
 - The combination of gametes from two parents
 - Both A and C
- ___ 47. Fertilization of a human ovum/egg produces a
- | | |
|---------------|------------|
| a. body cell. | c. sperm. |
| b. gamete. | d. zygote. |
- ___ 48. A cell produced by meiosis has
- half as many chromosomes as the mother cell.
 - twice as many chromosomes as the mother cell.
 - the same number of chromosomes as the mother cell.
 - the same number of chromosomes as the mother cell, but each cell is half its original size.
- ___ 49. Which statement below best describes the process of meiosis?
- Skin cells are replaced as they wear away.
 - Muscle cells turn to fat cells as a result of a lack of exercise.
 - A sperm penetrates an egg to form a zygote.
 - Cells with only half the original number of chromosomes are produced.
- ___ 50. New body cells (e.g., skin, heart, nerve) are produced by
- | | |
|-------------------|-------------|
| a. eggs. | c. meiosis. |
| b. fertilization. | d. mitosis. |

- _____ 51. Mitosis is the process by which
- a muscle cell makes an exact duplicate of itself.
 - a zygote is produced.
 - gametes are produced in the ovaries.
 - sperm are produced.
- _____ 52. Sexual reproduction is a process that requires
- only one parent and produces many offspring, all different.
 - only one parent and produces offspring very much like the parent.
 - two parents and produces offspring very much like the parents.
 - two parents and produces offspring, all different.
- _____ 53. The female reproductive organ of a flowering plant is called the
- filament.
 - pistil.
 - stamen.
 - stigma.
- _____ 54. Fertilization may be controlled by
- the number of male gametes entering the female gamete.
 - proteins and sugars on the surfaces of gametes.
 - the number of female gametes available.
 - the nature of the sexual activity.
- _____ 55. The process of internal fertilization results in
- gametes meeting inside the female's body.
 - an embryo being nourished and developing inside the mother's body.
 - a measure of protection for the embryo since it is inside the mother's body.
 - all of the above.
- _____ 56. The process of fertilizing an egg in a petri dish and then implanting the embryo in the uterus is referred to as
- artificial insemination.
 - gamete selection.
 - in vitro fertilization.
 - zygote transplant.
- _____ 57. Intracytoplasmic sperm injection results in
- a sperm cell being injected into an egg cell and the resulting zygote then being inserted into the uterus of the woman.
 - a sperm cell being injected into the upper uterus of a woman.
 - many sperm cells being injected into the fallopian tubes of a woman.
 - an additional sperm cell being injected into a zygote in a woman's uterus.
- _____ 58. During the process of gamete intrafallopian transfer,
- eggs and sperm are mixed together outside the woman's body.
 - a mixture of sperm and eggs is injected into the woman's fallopian tubes.
 - no embryo is produced outside the woman's body.
 - all of the above are true.
- _____ 59. Conception by means of any form of assisted reproductive technology may result in
- a higher number of birth defects.
 - a lower number of birth defects.
 - a much higher birth rate in Canada.
 - none of the above.

- ___ 60. The success rate of in vitro fertilization
- increases as a woman gets older.
 - decreases as a woman gets older.
 - is not affected by a woman's age.
 - is affected by the age of the sperm donor.

Matching

Identify the term that best matches the description, explanation, or function described.

- | | |
|------------------|-----------------|
| a. cell membrane | e. nuclear pore |
| b. cell wall | f. organelle |
| c. cytoplasm | g. protein |
| d. nucleus | h. vacuole |
- ___ 61. a specialized cell part designed to carry out specific functions
- ___ 62. a tough, rigid structure surrounding a plant cell
- ___ 63. a thin covering separating the cell contents from its surroundings
- ___ 64. a membrane-covered storage container within a cell
- ___ 65. a control centre for the cell
- ___ 66. a jelly-like substance that contains the organelles of a cell

Identify the stage of meiosis being described in each of the following statements. Each stage is identified only once.

- | | |
|-----------------|-----------------|
| a. anaphase I | g. metaphase II |
| b. anaphase II | h. mitosis |
| c. cytokinesis | i. prophase I |
| d. interkinesis | j. prophase II |
| e. meiosis | k. telophase I |
| f. metaphase I | l. telophase II |
- ___ 67. Each cluster of chromosomes at the ends of the cell has one of each type of chromosome—half the number the parent cell had.
- ___ 68. Chromosomes uncoil, and nuclear membranes form around four new nuclei.
- ___ 69. The cell grows and makes proteins, but there is no replication of the DNA.
- ___ 70. Each pair of chromatids splits to form two independent chromosomes.
- ___ 71. Paired chromatids coil and the nuclear membrane disappears.
- ___ 72. Paired chromatids line up in the middle of the cell.
- ___ 73. Paired chromatids uncoil, and cytokinesis occurs.
- ___ 74. Pairs of homologous chromosomes move to the middle of the cell.

Identify each of the following terms as related to the embryonic development of a human by matching it to the most correct description given.

- | | |
|-------------|-------------|
| a. blastula | e. gastrula |
| b. ectoderm | f. mesoderm |
| c. embryo | g. morula |
| d. endoderm | |

- ___ 75. the inner layer of the gastrula
- ___ 76. the middle layer of the gastrula
- ___ 77. the hollow structure formed from the small ball of cells formed after more cell divisions
- ___ 78. a ball of cells formed after fertilization and several rounds of cell division
- ___ 79. the outside layer of the gastrula
- ___ 80. the structure formed when the cells developing into the embryo organize themselves from a hollow ball into three layers

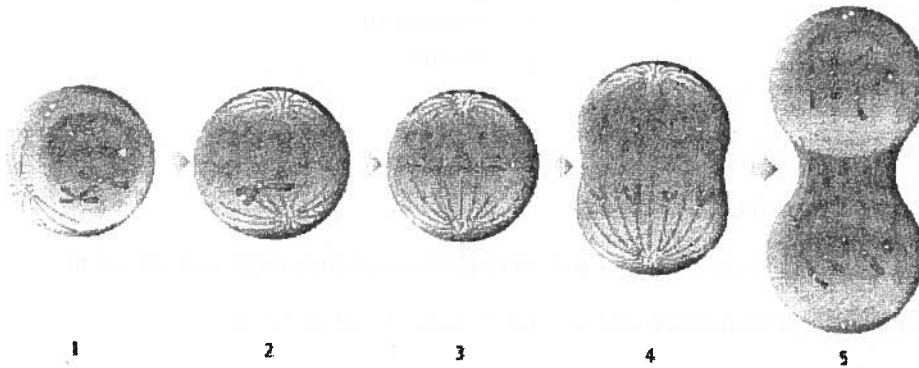
Short Answer

81. Which part of DNA makes up the genetic code?
82. Briefly explain why muscle cells have a large number of mitochondria.
83. Describe the arrangement of the nitrogen bases in DNA.
84. Describe three forms of gene mutation.
85. What is cloning? Give two examples of a form of reproduction that produces clones of the parent.
86. Describe how cancer cells are able to take hold and take over from healthy cells.
87. Describe the main advantage of sexual reproduction.
88. Describe the advantages and disadvantages of internal versus external fertilization.
89. Identify two examples of assisted reproductive procedures.
90. Describe the process of in vitro fertilization.

Problem

91. What would happen if cell membranes were permeable and allowed everything to pass through instead of being selectively permeable and controlling what flows into and out of the cell?

92. The diagrams below show a part of the cell cycle. Describe what must happen as the cell moves from what is shown in stage 1 to what is shown in stage 3.



93. Describe one difference between a plant cell and an animal cell during cytokinesis.
94. During interphase a cell is exposed to a high level of X rays. What could happen to the cell, if anything, as a result of this exposure?
95. What would be the result if the process of duplicating the DNA was not highly controlled within the cell?
96. You observe an apple tree and find that on the one tree there are four varieties of apples growing. Explain how this could be possible.
97. On the ground under a mushroom you observe tiny black specks. You collect these particles and place them on a thin layer of moist earth so that you can observe them later after you research mushrooms. Your research on mushrooms tells you that mushrooms reproduce asexually and require moisture but not light. When you return a few days later, you find tiny mushrooms growing where you left the particles. What must the particles have been?
98. Compare the stage of interphase with the stage of interkinesis.
99. Describe the events that occur during the first trimester of human fetal development.
100. How might a woman suffering from a hormone imbalance be treated medically to increase her chances of becoming pregnant?

Science 9 Pretest Reproduction

Answer Section

MULTIPLE CHOICE

1. ANS: B PTS: 1 DIF: Average OBJ: Section 4.1
LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
KEY: DNA | molecule | nitrogen | base
2. ANS: B PTS: 1 DIF: Average OBJ: Section 4.1
LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
KEY: genetic | code | bases | DNA | molecule
3. ANS: A PTS: 1 DIF: Average OBJ: Section 4.1
LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
KEY: organelle | channels | endoplasmic reticulum
4. ANS: C PTS: 1 DIF: Easy OBJ: Section 4.1
LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
KEY: chromosomes | cell | nucleus
5. ANS: C PTS: 1 DIF: Average OBJ: Section 4.1
LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
KEY: endoplasmic reticulum
6. ANS: D PTS: 1 DIF: Average OBJ: Section 4.1
LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
KEY: cytoplasm
7. ANS: B PTS: 1 DIF: Average OBJ: Section 4.1
LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
KEY: nucleolus | ribosomes
8. ANS: B PTS: 1 DIF: Average OBJ: Section 4.1
LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
KEY: nucleolus | ribosome
9. ANS: C PTS: 1 DIF: Average OBJ: Section 4.1
LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
KEY: ribosomes
10. ANS: B PTS: 1 DIF: Average OBJ: Section 4.1
LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
KEY: enzymes
11. ANS: A PTS: 1 DIF: Average OBJ: Section 4.2
LOC: LS-R-01 TOP: Mutation KEY: neutral mutation
12. ANS: A PTS: 1 DIF: Average OBJ: Section 4.1
LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
KEY: chromatin | chromosomes
13. ANS: B PTS: 1 DIF: Easy OBJ: Section 4.1
LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
KEY: chromosomes | cell
14. ANS: D PTS: 1 DIF: Average OBJ: Section 4.1
LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
KEY: bases | gene

15. ANS: C PTS: 1 DIF: Average OBJ: Section 4.1
 LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
 KEY: genetic | genome | chromosomes
16. ANS: B PTS: 1 DIF: Average OBJ: Section 4.1
 LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
 KEY: protein | messenger | hormone
17. ANS: A PTS: 1 DIF: Difficult OBJ: Section 4.1
 LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
 KEY: RNA | ribosome | protein
18. ANS: D PTS: 1 DIF: Average OBJ: Section 4.2
 LOC: LS-R-01 TOP: Mutation KEY: mutation | bases
19. ANS: B PTS: 1 DIF: Easy OBJ: Section 4.2
 LOC: LS-R-01 TOP: Mutation KEY: mutation | gene therapy
20. ANS: D PTS: 1 DIF: Average OBJ: Section 4.2
 LOC: LS-R-01 TOP: Mutation KEY: mutations | proteins | chromosomes | genes
21. ANS: D PTS: 1 DIF: Average OBJ: Section 5.2
 LOC: LS-R-03 TOP: Asexual Reproduction
 KEY: binary fission | asexual | cell division
22. ANS: B PTS: 1 DIF: Average OBJ: Section 5.2
 LOC: LS-R-03 TOP: Asexual Reproduction
 KEY: binary fission | offspring
23. ANS: C PTS: 1 DIF: Easy OBJ: Section 5.1
 LOC: LS-R-01 TOP: The Cell Cycle and Mitosis
 KEY: chromosomes | nucleus
24. ANS: A PTS: 1 DIF: Easy OBJ: Section 5.1
 LOC: LS-R-01 TOP: The Cell Cycle and Mitosis
 KEY: nucleus | deoxyribonucleic acid | DNA
25. ANS: D PTS: 1 DIF: Average OBJ: Section 5.1
 LOC: LS-R-01 TOP: The Cell Cycle and Mitosis
 KEY: mitosis
26. ANS: C PTS: 1 DIF: Average OBJ: Section 5.1
 LOC: LS-R-01 TOP: The Cell Cycle and Mitosis
 KEY: mitosis
27. ANS: B PTS: 1 DIF: Average OBJ: Section 5.2
 LOC: LS-R-03 TOP: Asexual Reproduction
 KEY: asexual | reproduction | parent
28. ANS: A PTS: 1 DIF: Average OBJ: Section 5.2
 LOC: LS-R-03 TOP: Asexual Reproduction
 KEY: clone | genetically identical
29. ANS: B PTS: 1 DIF: Difficult OBJ: Section 5.2
 LOC: LS-R-03 TOP: Asexual Reproduction
 KEY: budding | asexual reproduction | hydra
30. ANS: C PTS: 1 DIF: Easy OBJ: Section 5.2
 LOC: LS-R-03 TOP: Asexual Reproduction
 KEY: asexual reproduction
31. ANS: B PTS: 1 DIF: Average OBJ: Section 5.2
 LOC: LS-R-03 TOP: Asexual Reproduction
 KEY: budding | asexual reproduction
32. ANS: D PTS: 1 DIF: Average OBJ: Section 5.2
 LOC: LS-R-03 TOP: Asexual Reproduction
 KEY: vegetative reproduction
33. ANS: A PTS: 1 DIF: Average OBJ: Section 5.1
 LOC: LS-R-01 TOP: The Cell Cycle and Mitosis
 KEY: cytokinesis
34. ANS: B PTS: 1 DIF: Average OBJ: Section 5.1
 LOC: LS-R-01 TOP: The Cell Cycle and Mitosis
 KEY: mitosis | early prophase | nucleolus | nuclear membrane

35. ANS: D PTS: 1 DIF: Average OBJ: Section 5.1
 LOC: LS-R-01 TOP: The Cell Cycle and Mitosis KEY: mitosis
36. ANS: B PTS: 1 DIF: Average OBJ: Section 5.1
 LOC: LS-R-01 TOP: The Cell Cycle and Mitosis KEY: prophase | mitosis
37. ANS: C PTS: 1 DIF: Difficult OBJ: Section 5.2
 LOC: LS-R-02 TOP: Asexual Reproduction
 KEY: embryo | embryonic stem cells | specialized
38. ANS: D PTS: 1 DIF: Easy OBJ: Section 5.1
 LOC: LS-R-01 TOP: The Cell Cycle and Mitosis KEY: mitosis | proteins | spindle fibres
39. ANS: B PTS: 1 DIF: Average OBJ: Section 5.1
 LOC: LS-R-01 TOP: The Cell Cycle and Mitosis KEY: cell cycle | mutation | proteins
40. ANS: C PTS: 1 DIF: Average OBJ: Section 5.2
 LOC: LS-R-03 TOP: The Cell Cycle and Mitosis
 KEY: asexual reproduction | fragmentation
41. ANS: D PTS: 1 DIF: Average OBJ: Section 5.2
 LOC: LS-R-03 TOP: Asexual Reproduction KEY: mitosis | spore
42. ANS: C PTS: 1 DIF: Average OBJ: Section 5.2
 LOC: LS-R-03 TOP: Asexual Reproduction KEY: embryonic stem cells
43. ANS: C PTS: 1 DIF: Easy OBJ: Section 6.1
 LOC: LS-R-01 TOP: Meiosis KEY: inherit | genes
44. ANS: D PTS: 1 DIF: Average OBJ: Section 6.2
 LOC: LS-R-01 TOP: Sexual Reproduction KEY: seed | ovary
45. ANS: C PTS: 1 DIF: Average OBJ: Section 6.1
 LOC: LS-R-01 TOP: Meiosis KEY: meiosis
46. ANS: D PTS: 1 DIF: Average OBJ: Section 6.2
 LOC: LS-R-03 TOP: Sexual Reproduction
 KEY: sexual reproduction | gamete | chromosome
47. ANS: D PTS: 1 DIF: Easy OBJ: Section 6.2
 LOC: LS-R-03 TOP: Sexual Reproduction KEY: fertilization | zygote
48. ANS: A PTS: 1 DIF: Average OBJ: Section 6.1
 LOC: LS-R-01 TOP: Meiosis KEY: meiosis | chromosomes
49. ANS: D PTS: 1 DIF: Difficult OBJ: Section 6.1
 LOC: LS-R-01 TOP: Meiosis KEY: meiosis | chromosomes
50. ANS: D PTS: 1 DIF: Easy OBJ: Section 6.1
 LOC: LS-R-01 TOP: Meiosis KEY: mitosis
51. ANS: A PTS: 1 DIF: Average OBJ: Section 6.1
 LOC: LS-R-01 TOP: Meiosis KEY: mitosis
52. ANS: D PTS: 1 DIF: Average OBJ: Section 6.2
 LOC: LS-R-03 TOP: Sexual Reproduction KEY: sexual reproduction
53. ANS: B PTS: 1 DIF: Average OBJ: Section 6.2
 LOC: LS-R-02 TOP: Sexual Reproduction KEY: pistil
54. ANS: B PTS: 1 DIF: Difficult OBJ: Section 6.2
 LOC: LS-R-02 TOP: Sexual Reproduction KEY: fertilization | gametes
55. ANS: D PTS: 1 DIF: Easy OBJ: Section 6.2
 LOC: LS-R-03 TOP: Sexual Reproduction
 KEY: internal fertilization | gametes | embryo

56. ANS: C PTS: 1 DIF: Average OBJ: Section 6.3
 LOC: LS-R-02 TOP: Assisted Reproductive Technologies
 KEY: in vitro fertilization
57. ANS: A PTS: 1 DIF: Difficult OBJ: Section 6.3
 LOC: LS-R-02 TOP: Assisted Reproductive Technologies
 KEY: intracytoplasmic sperm injection | sperm | uterus | zygote
58. ANS: D PTS: 1 DIF: Average OBJ: Section 6.3
 LOC: LS-R-02 TOP: Assisted Reproductive Technologies
 KEY: gamete intrafallopian transfer | eggs | sperm | fallopian tubes
59. ANS: A PTS: 1 DIF: Average OBJ: Section 6.3
 LOC: LS-R-02 TOP: Assisted Reproductive Technologies
 KEY: assisted reproductive technology
60. ANS: B PTS: 1 DIF: Average OBJ: Section 6.3
 LOC: LS-R-02 TOP: Assisted Reproductive Technologies
 KEY: in vitro fertilization

MATCHING

61. ANS: F PTS: 1 DIF: Average OBJ: Section 4.1
 LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
 KEY: vacuole
62. ANS: B PTS: 1 DIF: Easy OBJ: Section 4.1
 LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
 KEY: cell wall | rigid
63. ANS: A PTS: 1 DIF: Easy OBJ: Section 4.1
 LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
 KEY: cell membrane
64. ANS: H PTS: 1 DIF: Average OBJ: Section 4.1
 LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
 KEY: vacuole | membrane | storage
65. ANS: D PTS: 1 DIF: Easy OBJ: Section 4.1
 LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
 KEY: control centre | nucleus
66. ANS: C PTS: 1 DIF: Average OBJ: Section 4.1
 LOC: LS-R-01 TOP: The Function of the Nucleus within the Cell
 KEY: cytoplasm | organelles
67. ANS: A PTS: 1 DIF: Average OBJ: Section 6.1
 LOC: LS-R-01 TOP: Meiosis KEY: anaphase I
68. ANS: L PTS: 1 DIF: Easy OBJ: Section 6.1
 LOC: LS-R-01 TOP: Meiosis KEY: telophase II
69. ANS: D PTS: 1 DIF: Easy OBJ: Section 6.1
 LOC: LS-R-01 TOP: Meiosis KEY: interkinesis
70. ANS: B PTS: 1 DIF: Average OBJ: Section 6.1
 LOC: LS-R-01 TOP: Meiosis KEY: anaphase II
71. ANS: J PTS: 1 DIF: Difficult OBJ: Section 6.1
 LOC: LS-R-01 TOP: Meiosis KEY: prophase II

72. ANS: G PTS: 1 DIF: Difficult OBJ: Section 6.1
 LOC: LS-R-01 TOP: Meiosis KEY: metaphase II
73. ANS: K PTS: 1 DIF: Average OBJ: Section 6.1
 LOC: LS-R-01 TOP: Meiosis KEY: telophase I
74. ANS: F PTS: 1 DIF: Average OBJ: Section 6.1
 LOC: LS-R-01 TOP: Meiosis KEY: metaphase I
75. ANS: D PTS: 1 DIF: Average OBJ: Section 6.2
 LOC: LS-R-02 TOP: Sexual Reproduction KEY: endoderm | gastrula
76. ANS: F PTS: 1 DIF: Average OBJ: Section 6.2
 LOC: LS-R-02 TOP: Sexual Reproduction KEY: mesoderm | gastrula
77. ANS: A PTS: 1 DIF: Average OBJ: Section 6.2
 LOC: LS-R-02 TOP: Sexual Reproduction KEY: blastula
78. ANS: G PTS: 1 DIF: Average OBJ: Section 6.2
 LOC: LS-R-02 TOP: Sexual Reproduction KEY: morula
79. ANS: B PTS: 1 DIF: Average OBJ: Section 6.2
 LOC: LS-R-02 TOP: Sexual Reproduction KEY: ectoderm | gastrula
80. ANS: E PTS: 1 DIF: Average OBJ: Section 6.2
 LOC: LS-R-02 TOP: Sexual Reproduction KEY: gastrula

SHORT ANSWER

81. ANS:
 The sequence of nitrogen bases in the rungs of the ladder forms the genetic code.
- PTS: 1 DIF: Average OBJ: Section 4.1 LOC: LS-R-01
 TOP: The Function of the Nucleus within the Cell KEY: genetic code | nitrogen bases
82. ANS:
 Muscle cells are responsible for moving different parts of our bodies. Movement requires energy, and mitochondria provide cells with energy through a process called respiration.
- PTS: 2 DIF: Average OBJ: Section 4.1 LOC: LS-R-01
 TOP: The Function of the Nucleus within the Cell KEY: cell | mitochondria | respiration
83. ANS:
 Adenine always joins onto thymine and cytosine always joins onto guanine. These combinations form the rungs of a ladder-like structure with small sugar-phosphate molecules forming the sides of the ladder.
- PTS: 2 DIF: Average OBJ: Section 4.1 LOC: LS-R-01
 TOP: The Function of the Nucleus within the Cell
 KEY: nitrogen bases | DNA | adenine | guanine | cytosine | thymine
84. ANS:
 1. One of the bases could be left out of the sequence.
 2. An extra base could be added to the sequence.
 3. One base could be substituted for another within the gene.
- PTS: 3 DIF: Average OBJ: Section 4.2 LOC: LS-R-01
 TOP: Mutation KEY: gene | mutation | base

85. ANS:

Cloning is the process of forming identical offspring from a single cell or tissue. Binary fission, spore formation, vegetative reproduction, and budding all produce clones of the parent.

PTS: 3 DIF: Average OBJ: Section 5.2 LOC: LS-R-03

TOP: Asexual Reproduction

KEY: cloning | clone | spore | binary fission | vegetative reproduction | budding

86. ANS:

- Cancer cells are not specialized so they do not function as part of your body.
- Cancer cells can release chemicals to attract small nearby blood vessels.
- The blood vessels branch into the tumour and deliver nutrients to it instead of to the healthy cells.
- Nutrients feed the growing tumour and tumour cells divide even more rapidly.

PTS: 1 DIF: Average OBJ: Section 5.1 LOC: LS-R-01

TOP: The Cell Cycle and Mitosis

KEY: cancer | tumour

87. ANS:

- Offspring are genetically different from their parents, so they are more likely to survive diseases or other threats.

PTS: 1 DIF: Average OBJ: Section 6.2 LOC: LS-R-03

TOP: Sexual Reproduction

KEY: sexual reproduction

88. ANS:

- External fertilization: Very little energy is required to find a mate.
- External fertilization: Great numbers of offspring can repopulate an area after a disaster.
- Internal fertilization: More protection is given to the embryo.
- Internal fertilization: More parental care is given to offspring.
- Internal fertilization: More energy is generally required to find a mate.
- Internal fertilization: Fewer offspring are produced, so if the number of predators increases, a population will decline.
- External fertilization: Gametes, embryos, and offspring are unprotected and are often preyed upon.

PTS: 6 DIF: Average OBJ: Section 6.2 LOC: LS-R-03

TOP: Sexual Reproduction

KEY: sexual reproduction

89. ANS:

Examples of assisted reproductive procedures include artificial insemination, in vitro fertilization, gamete intrafallopian transfer, and intracytoplasmic sperm injection.

PTS: 2 DIF: Average OBJ: Section 6.3 LOC: LS-R-02

TOP: Assisted Reproductive Technologies

KEY: assisted reproductive technologies | artificial insemination | in vitro fertilization | gamete intrafallopian transfer | intracytoplasmic sperm injection

90. ANS:

- In vitro fertilization ("test-tube baby"; "in vitro" means in glass)
- An egg is fertilized in a petri dish.
- Two to four days after fertilization, the embryo is returned to the uterus in the hopes that it will become implanted and begin developing.
- A number of embryos are placed in the uterus at any given time, so the chance of multiple births exists.
- Side effects for the woman include dizziness, nausea, and headaches.

PTS: 3

DIF: Average

OBJ: Section 6.3

LOC: LS-R-02

TOP: Assisted Reproductive Technologies

KEY: in vitro fertilization

PROBLEM

91. ANS:

All sorts of substances would enter the cell, including substances the cell does not need or substances that might harm the cell. As well, the cell would lose materials that are necessary for its survival instead of just wastes.

PTS: 1

DIF: Average

OBJ: Section 4.1

LOC: LS-R-01

TOP: The Function of the Nucleus within the Cell

KEY: permeable | selectively permeable | cell membrane

92. ANS:

- The nucleolus disappears.
- The nuclear membrane disappears.
- The centrioles move to the poles of the cell.
- The spindle fibres form from the poles to the centre of the cell.
- The sister chromatids join together at the centromere.
- The chromatids line up across the middle of the cell.
- The spindle fibres join each pair of chromatids to the poles of the cell.
- The spindle fibres start to shorten and pull the chromatids apart and toward opposite poles of the cell.

PTS: 6

DIF: Difficult

OBJ: Section 5.1

LOC: LS-R-01

TOP: The Cell Cycle and Mitosis

KEY: cell cycle | nucleolus | centrioles | centromere | spindle fibres | chromatids

93. ANS:

During cytokinesis in a plant cell, the cell wall grows a plate across the centre of the cell to divide the cell into two daughter cells. Since the animal cell does not have a cell wall, this plate does not develop in an animal cell.

PTS: 2

DIF: Average

OBJ: Section 5.1

LOC: LS-R-01

TOP: The Cell Cycle and Mitosis

KEY: cytokinesis | plate

94. ANS:

A mutation of the DNA could occur, causing the cell to become cancerous. The mutation could result in checkpoint proteins not being created properly so that the cell reproduces uncontrollably.

PTS: 2

DIF: Average

OBJ: Section 5.1

LOC: LS-R-01

TOP: The Cell Cycle and Mitosis

KEY: interphase | cancer | x-rays

95. ANS:

- Mutations would be more likely to occur.
- Cells that had errors within them would be more likely to reproduce, resulting in more instances of cancer.
- More mutated cells would reproduce.
- Fewer organisms would be able to survive.

PTS: 2 DIF: Difficult OBJ: Section 5.1 LOC: LS-R-01
 TOP: The Cell Cycle and Mitosis KEY: cancer | DNA | mutation

96. ANS:

Scions of each of the four types of apples must have been grafted to a common root stock and stem system.

PTS: 1 DIF: Average OBJ: Section 5.2 LOC: LS-R-03
 TOP: Asexual Reproduction KEY: graft | scion

97. ANS:

spores

PTS: 1 DIF: Easy OBJ: Section 5.2 LOC: LS-R-03
 TOP: Asexual Reproduction KEY: spores

98. ANS:

Interkinesis is the stage between cell divisions during meiosis in which the cell will grow and make proteins as in interphase, but there is no replication of the DNA during the stage. Interphase occurs between cytokinesis and prophase I in meiosis, and between cytokinesis and prophase in mitosis.

PTS: 2 DIF: Average OBJ: Section 6.1 LOC: LS-R-01
 TOP: Meiosis KEY: interkinesis | interphase

99. ANS:

- Weeks 3–4 - Brain and spinal cord are formed.
 - The fetus is about 4 mm in length.
- Weeks 5–8 - Digits appear.
 - The ears, kidneys, lungs, liver, and muscles are developing.
 - The fetus is about 4 cm in length.
- Weeks 9–12 - Sexual differentiation is almost complete.
 - The fetus is about 9 cm in length.

PTS: 3 DIF: Average OBJ: Section 6.2 LOC: LS-R-02
 TOP: Sexual Reproduction KEY: fetal development

100. ANS:

A woman suffering from a hormone imbalance might receive hormone injections to increase her chances of becoming pregnant.

PTS: 1 DIF: Easy OBJ: Section 6.3 LOC: LS-R-02
 TOP: Assisted Reproductive Technologies KEY: hormone | injection