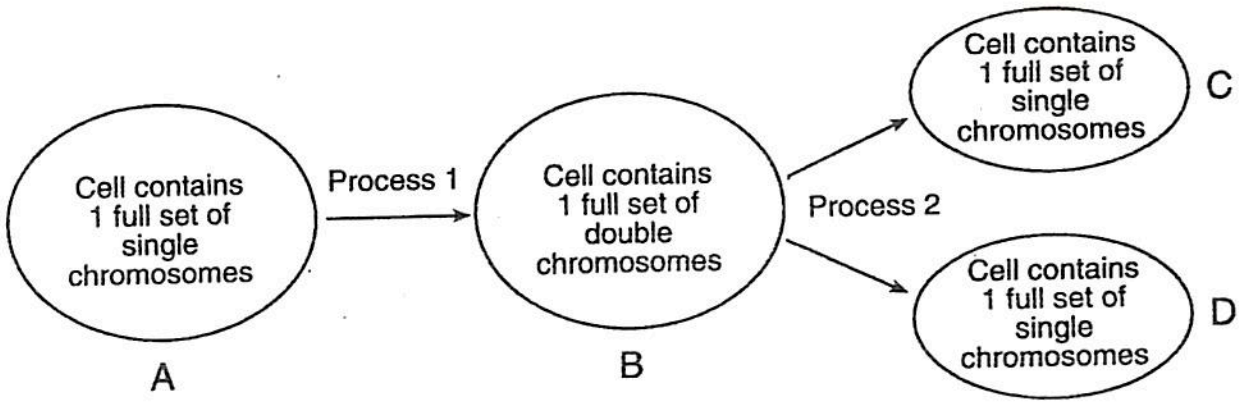
Name_____ Date_____

Reproduction Review

1. Base your answer to the following question on the diagram below and on your knowledge of biology. The diagram represents a single-celled organism, such as an ameba, undergoing the changes shown.



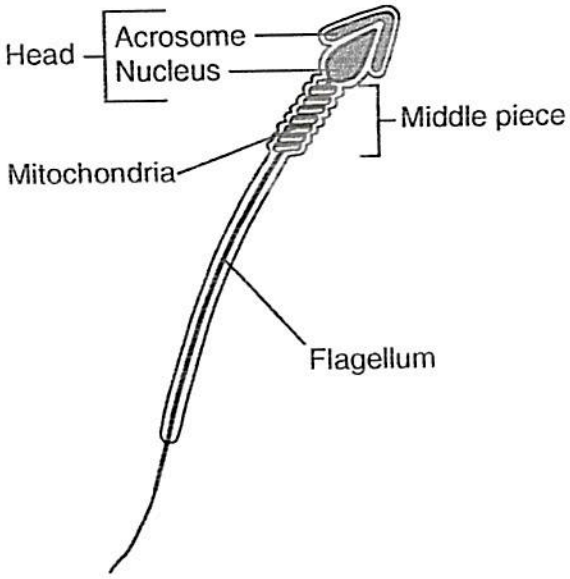
Process 1 is known as
(1) replication (2) meiosis (3) differentiation (4) digestion

2. Which statement correctly describes the genetic makeup of the sperm cells produced by a human male?
   (1) Each cell has pairs of chromosomes and the cells are usually genetically identical.
   (2) Each cell has pairs of chromosomes and the cells are usually genetically different.
   (3) Each cell has half the normal number of chromosomes and the cells are usually genetically identical.
   (4) Each cell has half the normal number of chromosomes and the cells are usually genetically different.

3. Down syndrome is a genetic disorder caused by the presence of an extra chromosome in the body cells of humans. This extra chromosome occurs in a gamete as a result of
   (1) an error in the process of cloning
   (2) an error in meiotic cell division
   (3) a gene mutation
   (4) replication of a single chromosome during mitosis

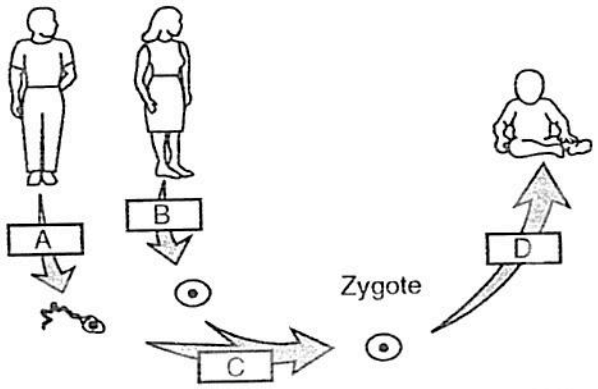
4. Which cell process occurs only in organisms that reproduce sexually?
   (1) mutation (3) meiosis
   (2) replication (4) mitosis

5. A sperm cell from an organism is represented in the diagram below.



Which statement regarding this sperm cell is not correct?
   (1) The acrosome contains half the normal number of chromosomes.
   (2) Energy to move the flagellum originates in the middle piece.
   (3) The head may contain a mutation.
   (4) This cell can unite with another cell resulting in the production of a new organism.

6. The diagram below represents processes involved in human reproduction.



Row	A	B	C	D
(1)	mitosis	meiosis	fertilization	differentiation
(2)	meiosis	meiosis	fertilization	differentiation
(3)	meiosis	mitosis	differentiation	fertilization
(4)	mitosis	mitosis	differentiation	fertilization

Which row in the chart below correctly identifies the processes represented by the letters in the diagram?
(1) 1 (2) 2 (3) 3 (4) 4

7. Most cells in the body of a fruit fly contain eight chromosomes. In some cells, only four chromosomes are present, a condition which is a direct result of
   (1) mitotic cell division
   (2) meiotic cell division
   (3) embryonic differentiation
   (4) internal fertilization

8. Which cell is normally produced as a direct result of meiosis?
   (1) a uterine cell having half the normal species number of chromosomes
   (2) an egg having the full species number of chromosomes
   (3) a zygote having the full species number of chromosomes
   (4) a sperm having half the normal species number of chromosomes

9. Which two structures of a frog would most likely have the same chromosome number?
   (1) skin cell and fertilized egg cell
   (2) zygote and sperm cell
   (3) kidney cell and egg cell
   (4) liver cell and sperm cell

10. In an environment that undergoes frequent change, species that reproduce sexually may have an advantage over species that reproduce asexually because the sexually reproducing species produce
    (1) more offspring in each generation
    (2) identical offspring
    (3) offspring with more variety
    (4) new species of offspring in each generation

11. Reproduction in humans usually requires
    (1) the process of cloning
    (2) mitotic cell division of gametes
    (3) gametes with chromosomes that are not paired
    (4) the external fertilization of sex cells

12. Which row in the chart below best describes asexual reproduction?

Row	Number of Parents	Comparison of Offspring to Parents
(1)	one	identical
(2)	one	different
(3)	two	identical
(4)	two	different

(1) 1 (3) 3
(2) 2 (4) 4

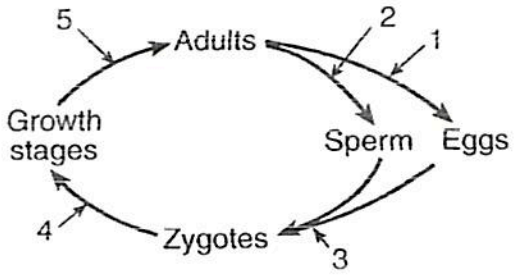
13. Which statement describes asexual reproduction?
(1) Adaptive traits are usually passed from parent to offspring without genetic modification.
(2) Mutations are not passed from generation to generation.
(3) It always enables organisms to survive in changing environmental conditions.
(4) It is responsible for many new variations in offspring.

14. Meiosis and fertilization are important for the survival of many species because these two processes result in
(1) large numbers of gametes
(2) increasingly complex multicellular organisms
(3) cloning of superior offspring
(4) genetic variability of offspring

15. Which statement is true of both mitosis and meiosis?
(1) Both are involved in asexual reproduction.
(2) Both occur only in reproductive cells.
(3) The number of chromosomes is reduced by half.
(4) DNA replication occurs before the division of the nucleus.

16. The series of rapid cell divisions that occur immediately after zygote formation is known as
(1) fertilization (3) differentiation
(2) meiosis (4) cleavage

17. The arrows in the diagram below illustrate processes in the life of a species that reproduces sexually.



Which processes result directly in the formation of cells with half the amount of genetic material that is characteristic of the species?
(1) 1 and 2 (3) 3 and 4
(2) 2 and 3 (4) 4 and 5

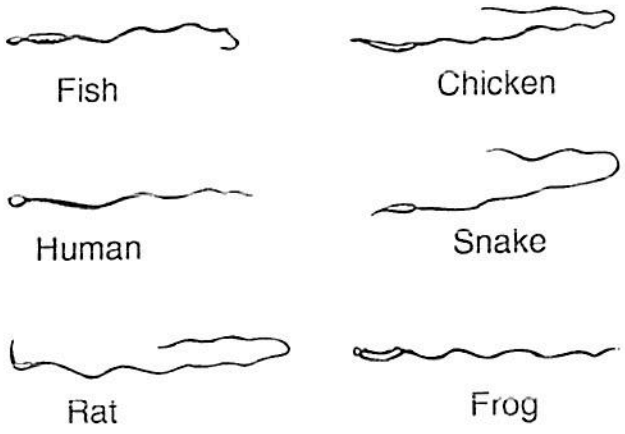
18. Compared to human cells resulting from mitotic cell division, human cells resulting from meiotic cell division would have
(1) twice as many chromosomes
(2) the same number of chromosomes
(3) one-half the number of chromosomes
(4) one-quarter as many chromosomes

19. Which statement best explains the significance of meiosis in the process of evolution within a species?
(1) The gametes produced by meiosis ensure the continuation of any particular species by asexual reproduction.
(2) Equal numbers of eggs and sperm are produced by meiosis.
(3) Meiosis produces eggs and sperm that are alike.
(4) Meiosis provides for variation in the gametes produced by an organism.

20. An adaptation that has enabled animals to reproduce successfully on land is
(1) semen as a transport medium for sperm
(2) egg cells with the ability to locomote
(3) fertilization outside the body of the female
(4) diploid gametes that undergo differentiation

21. In sexually reproducing species, the number of chromosomes in each body cell remains the same from one generation to the next as a direct result of
    (1) meiosis and fertilization
    (2) mitosis and mutation
    (3) differentiation and aging
    (4) homeostasis and dynamic equilibrium

22. The diagrams below represent cells that transport chromosomes.

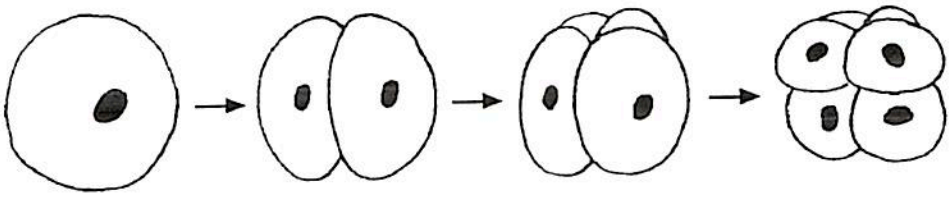


    These cells are specialized for
    (1) oxygen transport
    (2) transmitting chemical signals over long distances
    (3) sexual reproduction
    (4) injecting antibodies into harmful bacteria

23. A characteristic of fertilization in most terrestrial vertebrates is the
    (1) fusion of gametes in a moist internal environment
    (2) fusion of gametes in a dry external environment
    (3) release of thousands of eggs
    (4) release of nonmotile sperm

24. External fertilization occurs most often in
    (1) mammals and birds
    (2) reptiles and birds
    (3) amphibians and reptiles
    (4) fish and amphibians

25. The diagram below represents some stages of early embryonic development.



Zygote

Which process is represented by the arrows in the diagram?

(1) meiosis (2) fertilization (3) mitosis (4) evolution

26. A cell resulting from the fertilization of an egg begins to divide. Two cells are formed that normally remain attached and could develop into a new individual. If the two cells become separated, which statement describes what would most likely occur?

(1) The cells would each have all of the needed genetic information, and both could survive.

(2) The cells would each have only one-half of the needed genetic information, so both would die.

(3) One cell would have all of the needed genetic information and would survive, but the other would have none of the needed genetic information and would die.

(4) Each cell would have some of the needed genetic information, but would be unable to share it, so both would die.

27. For a human zygote to become an embryo, it must undergo

(1) meiosis (3) regeneration

(2) cleavage (4) disjunction

28. Tissues develop from a zygote as a direct result of the processes of

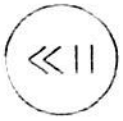
(1) fertilization and meiosis

(2) fertilization and differentiation

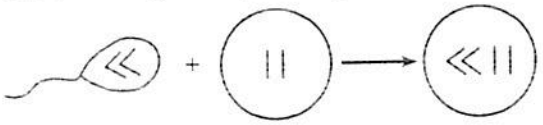
(3) mitosis and meiosis

(4) mitosis and differentiation

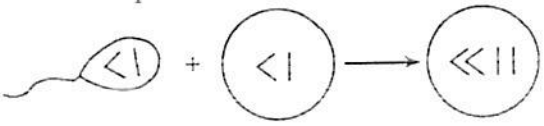
29. The diagram below represents a nucleus containing the normal chromosome number for a species.



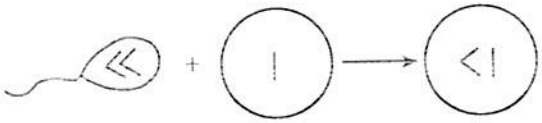
Which diagram bests illustrates the normal formation of a cell that contains all of the genetic information needed for growth, development, and future reproduction of this species?



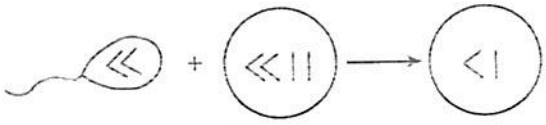
(1)



(3)

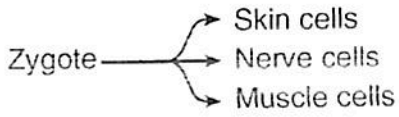


(2)



(4)

30. Which developmental process is represented by the diagram below?

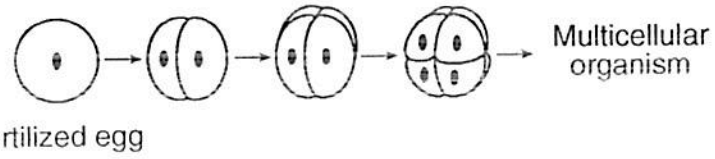


(1) fertilization
(2) differentiation
(3) evolution
(4) mutation

31. After the union of sperm and egg, the single-celled zygote develops into a multicellular organism with specialized cells by the processes of
(1) meiosis and replication
(2) mitosis and differentiation
(3) cloning and growth
(4) fertilization and gamete production

32. The human brain, kidney, and liver all develop from the same zygote. This fact indicates that cells formed by divisions of the zygote are able to
(1) differentiate
(2) mutate
(3) undergo cloning
(4) be fertilized

33. Which phrase best describes a process represented in the diagram below?



(1) a zygote dividing by mitosis
(2) a zygote dividing by meiosis
(3) a gamete dividing by mitosis
(4) a gamete dividing by meiosis

34. Some stages in the development of an individual are listed below.

(A) differentiation of cells into tissues
(B) fertilization of egg by sperm
(C) organ development
(D) mitotic cell division of zygote

Which sequence represents the correct order of these stages?

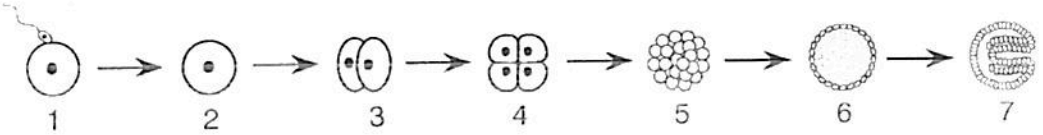
(1) *A–B–C–D*
(2) *B–C–A–D*
(3) *D–B–C–A*
(4) *B–D–A–C*

35. Most mammals have adaptations for
(1) internal fertilization and internal development of the fetus
(2) internal fertilization and external development of the fetus
(3) external fertilization and external development of the fetus
(4) external fertilization and internal development of the fetus

36. In most animal species with internal development, the embryo becomes implanted in the lining of the
(1) stomach
(2) liver
(3) ovary
(4) uterus

37. The reproductive cycle of a human is usually regulated by
(1) gametes
(2) hormones
(3) natural selection
(4) immune responses

38. The sequence of diagrams below represents some events in a reproductive process.



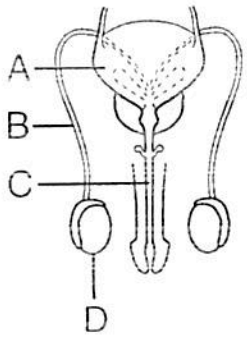
To regulate similar events in human reproduction, what adaptations are required?

(1) the presence of genes and chemicals in each cell in stages 1 to 7
(2) an increase in the number of genes in each cell in stages 3 to 5
(3) the removal of all enzymes from the cells in stage 7
(4) the elimination of mutations from cells after stage 5

39. Which adaptation for successful development is characteristic of all embryos?

(1) a shell for protection from predators
(2) a parent for protection from predators
(3) a sac for storage of wastes
(4) a mechanism for absorbing oxygen

40. The diagram below represents a human reproductive system.



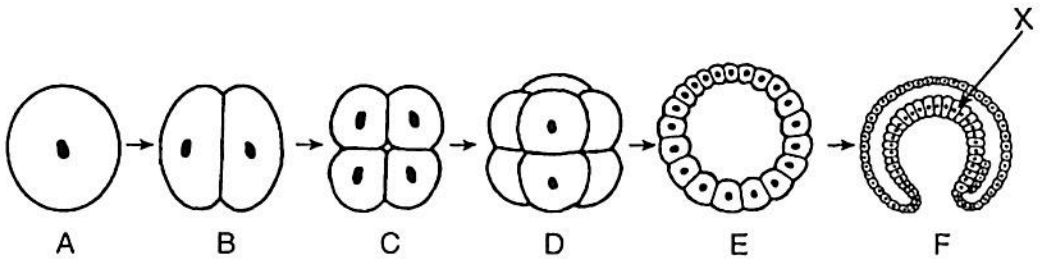
Meiosis occurs within structure

(1) *A* (3) *C*
(2) *B* (4) *D*

41. Which reproductive structure is correctly paired with its function?

(1) uterus—usual site of fertilization
(2) testis—usual location for egg development
(3) ovary—delivers nutrients to the embryo
(4) sperm—transports genetic material

42. Base your answer to the following question on the diagram of some of the stages of embryonic development below and on your knowledge of biology.



Stages *A* through *D* occur immediately after the process of

(1) oogenesis (2) fertilization (3) gastrulation (4) ovulation

43. Which statement describes the reproductive system of a human male?

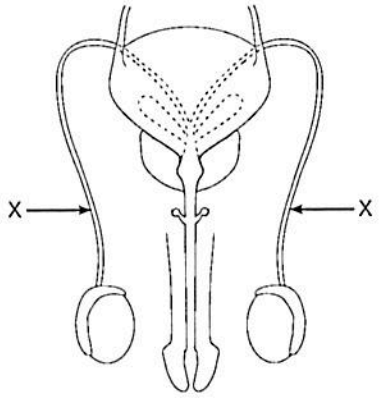
(1) It releases sperm that can be used only in external fertilization.

(2) It synthesizes progesterone that regulates sperm formation.

(3) It produces gametes that transport food for embryo formation.

(4) It shares some structures with the excretory system.

44. Some body structures of a human male are represented in the diagram below.



An obstruction in the structures labeled *X* would directly interfere with the

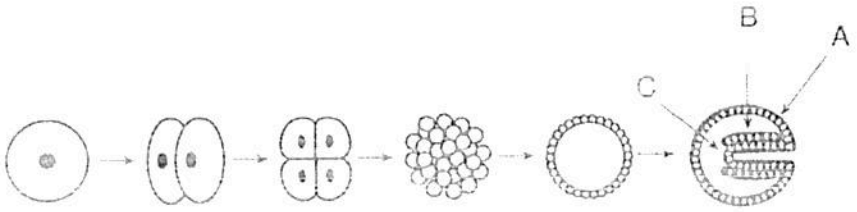
(1) transfer of sperm to a female

(2) production of sperm

(3) production of urine

(4) transfer of urine to the external environment

45. The diagram and chart below represent some of the changes a zygote undergoes during its development.



Layer	Develops Into
A	skin and nervous system
B	muscles and blood vessels
C	digestive and respiratory systems

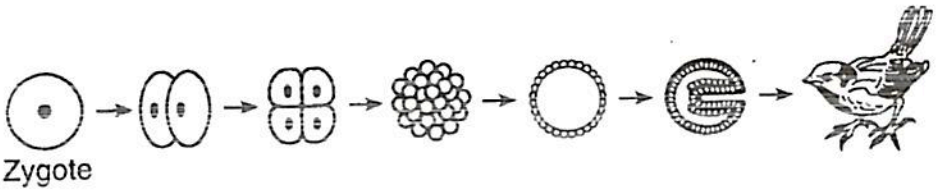
The processes that are most directly responsible for these changes are
(1) sorting and recombination of genetic information
(2) mitosis and differentiation
(3) meiosis and adaptation
(4) fertilization and cycling of materials

46. The reproductive system of the human male produces gametes and
(1) transfers gametes to the female for internal fertilization
(2) produces enzymes that prevent fertilization
(3) releases hormones involved in external fertilization
(4) provides an area for fertilization

47. The human female reproductive system is adapted for
(1) production of zygotes in ovaries
(2) external fertilization of gametes
(3) production of milk for a developing embryo
(4) transport of oxygen through a placenta to a fetus

48. Toxins can harm a developing fetus. They usually enter the fetus by the process of
(1) blood flow from the mother to the fetus
(2) active transport from the ovary
(3) diffusion across placental membranes
(4) recombination of genes from the fetus and mother

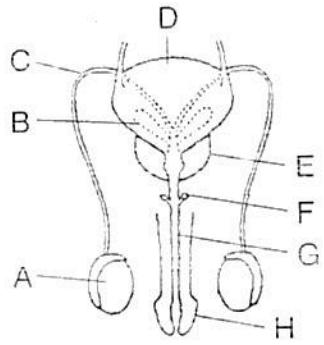
49. The diagram below represents a series of events in the development of a bird.



Which series of terms best represents the sequence of processes shown?

(1) meiosis → growth → differentiation
(2) meiosis → differentiation → growth
(3) mitosis → meiosis → differentiation
(4) mitosis → differentiation → growth

Base your answers to questions **50** through **52** on on the picture below which represents systems in a human male and on your knowledge of biology.



50. Which structure has both reproductive and excretory functions?

(1) A
(2) G
(3) C
(4) D

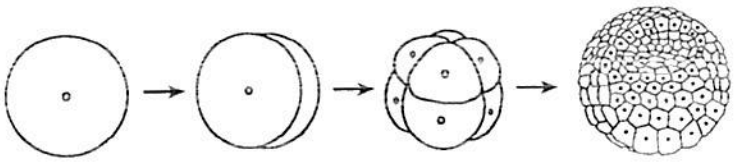
51. Which structures aid in the transport of sperm by secreting fluid?

(1) A and H
(2) B and E
(3) C and D
(4) D and H

52. Which sequence represents the path of sperm leaving the body?

(1) $A \rightarrow C \rightarrow G$
(2) $A \rightarrow C \rightarrow B$
(3) $E \rightarrow F \rightarrow H$
(4) $D \rightarrow F \rightarrow G$

53. Part of embryonic development in a species is illustrated in the diagram below.



Fertilized egg Embryo

Which set of factors plays the most direct role in controlling the events shown in the diagram?

(1) genes, hormones, and cell location
(2) antibodies, insulin, and starch
(3) ATP, amino acids, and inorganic compounds
(4) abiotic resources, homeostasis, and selective breeding

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54. Removal of one ovary from a human female would most likely affect the production of eggs make fertilization impossible make carrying a fetus impossible decrease her ability to provide essential nutrients to an embryo

(1) affect the production of eggs
(2) make fertilization impossible
(3) make carrying a fetus impossible
(4) decrease her ability to provide essential nutrients to an embryo

55. The human reproductive system is regulated by

(1) restriction enzymes
(2) antigens
(3) complex carbohydrates
(4) hormones

56. One function of the placenta in a human is to

(1) surround the embryo and protect it from shock
(2) allow for mixing of maternal blood with fetal blood
(3) act as the heart of the fetus, pumping blood until the fetus is born
(4) permit passage of nutrients and oxygen from the mother to the fetus

57. In humans, the number of sperm cells required to produce a pair of identical twins is

(1) 1 (3) 3
(2) 2 (4) 4

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58. The data in the table below indicate the presence of specific reproductive hormones in blood samples taken from three individuals. An *X* in the hormone column indicates a positive lab test for the appropriate levels necessary for normal reproductive functioning in that individual.

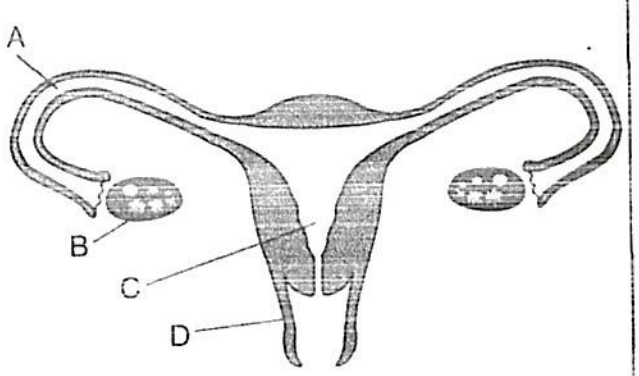
Data Table

Individuals	Hormones Present		
	Testosterone	Progesterone	Estrogen
1		X	X
2			X
3	X		

Which processes could occur in individual 3?

(1) production of sperm, only
(2) production of sperm and production of eggs
(3) production of eggs and embryonic development
(4) production of eggs, only

59. A diagram of human female reproductive structures is shown below.



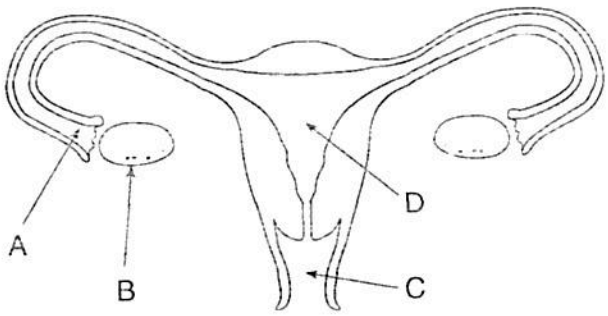
Which structure is correctly paired with its function?

(1) *A* – releases estrogen and progesterone
(2) *B* – produces and releases the egg
(3) *C* – provides the usual site for fertilization
(4) *D* – nourishes a developing embryo

60. As women age, their reproductive cycles stop due to decreased

(1) digestive enzyme production
(2) production of ATP
(3) levels of specific hormones
(4) heart rate

Base your answers to questions **61** and **62** on the diagram below, which represents the human female reproductive system.



61. In which part of this system does a fetus usually develop?

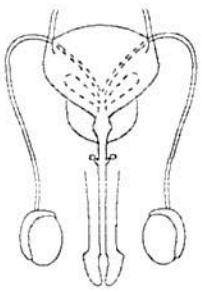
(1) *A* (3) *C*
(2) *B* (4) *D*

62. New inherited characteristics may appear in offspring as a result of new combinations of existing genes or may result from mutations in genes contained in cells produced by structure

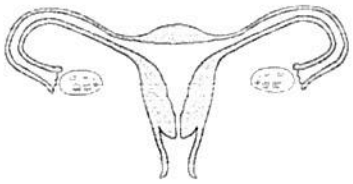
(1) *A* (3) *C*
(2) *B* (4) *D*

Base your answers to questions **63** through **65** on the following information.

The diagrams below represent organs of two individuals. The diagrams are followed by a list of sentences. For each phrase, select the sentence from the list below that best applies to that phrase. Then record its *number* in the space provided.



Individual A



Individual B

Sentences

1. The phrase is correct for both Individual A and Individual B.
2. The phrase is not correct for either Individual A or Individual B.
3. The phrase is correct for Individual A, only.
4. The phrase is correct for Individual B, only

63. Contains a structure in which a zygote divides by mitosis

64. Contains organs involved in internal fertilization

65. Contains organs that produce gametes

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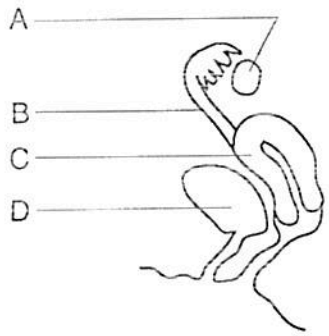
66. The human menstrual cycle is controlled by hormones produced and secreted by the
    (1) ovaries, only
    (2) uterus, only
    (3) pituitary gland and ovaries
    (4) pituitary gland and uterus

67. Human egg cells are most similar to human sperm cells in their
    (1) degree of motility
    (2) amount of stored food
    (3) chromosome number
    (4) shape and size

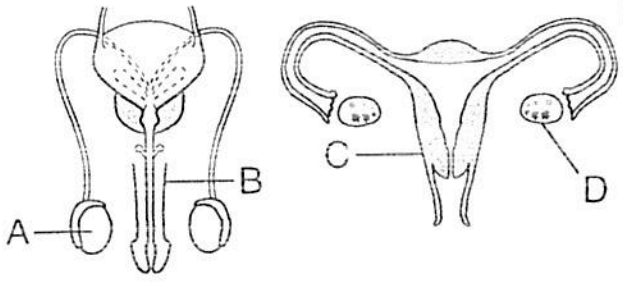
68. Structures in a human female are represented in the diagram below.



A heavy dose of radiation would have the greatest impact on genetic information in future offspring if it reached gametes developing within structure

(1) *A* (3) *C*
(2) *B* (4) *D*

69. The diagram below represents human reproductive systems.



Which statement best describes part of the human reproductive process?

(1) Testosterone produced in *A* is transferred to *D*, where it influences embryonic development.
(2) Testosterone produced in *D* influences formation of sperm within *B*.
(3) Estrogen and progesterone influence the activity of *C*.
(4) Progesterone stimulates the division of the egg within *C*.

Base your answers to questions 70 through 72 on the stage of the human menstrual cycle, *chosen from the list below*, that is most closely associated with that statement.

Stages of the Human Menstrual Cycle

(1) Follicle
(2) Ovulation
(3) Corpus luteum
(4) Menstruation

70. It usually will *not* occur if a zygote is formed during the cycle.

(1) 1 (3) 3
(2) 2 (4) 4

71. A mature egg is released.

(1) 1 (3) 3
(2) 2 (4) 4

72. It is characterized by a yellow-bodied structure that secretes the hormone progesterone.

(1) 1 (3) 3
(2) 2 (4) 4

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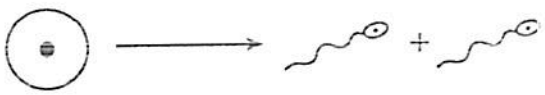
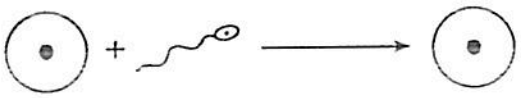
73. Which diagram best illustrates an event in sexual reproduction that would most directly lead to the formation of a human embryo?

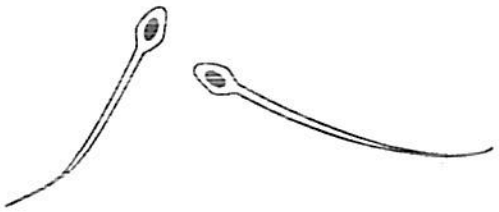
(1) 

(2) 

(3) 

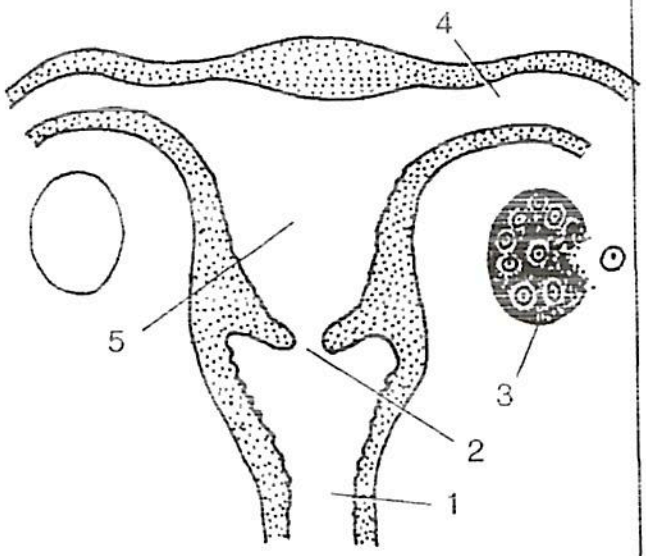
(4) 

74. Which statement about the gametes represented in the diagram below is correct?



(1) They are produced by females.
(2) They are fertilized in an ovary.
(3) They transport genetic material.
(4) They are produced by mitosis.

75. The diagram below represents part of the human female reproductive system.



Fertilization and development normally occur in structures

(1) 1 and 5
(2) 2 and 4
(3) 3 and 1
(4) 4 and 5

76. Identical twins develop from

(1) one egg, fertilized by one sperm cell
(2) one egg, fertilized by two separate sperm cells
(3) two eggs, both fertilized by the same sperm cell
(4) two eggs, each fertilized by a separate sperm cell

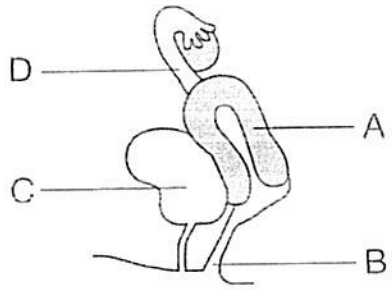
77. Which event would most probably result in the production of fraternal twins?

(1) One egg is fertilized by two sperm cells.
(2) Two egg cells are fertilized by one sperm cell.
(3) Two egg cells are each fertilized by separate sperm cells.
(4) Two eggs develop without fertilization.

78. Which statement describes one function of the placenta in mammals?

(1) It allows blood of the mother to mix with the blood of the fetus.
(2) It contains fluid that protects the embryo from harm.
(3) It removes waste products that are produced in the cells of the fetus.
(4) It synthesizes food for the embryo.

79. The letters in the diagram below represent structures in a human female.



Estrogen and progesterone increase the chance for successful fetal development by regulating activities within structure

(1) A
(2) B
(3) C
(4) D

80. Which substance usually passes in the greatest amount through the placenta from the blood of the fetus to the blood of the mother?

(1) oxygen
(2) carbon dioxide
(3) amino acids
(4) glucose

81. Which statement about embryonic organ development in humans is accurate?
    (1) It is affected primarily by the eating habits and general health of the father.
    (2) It may be affected by the diet and general health of the mother.
    (3) It will not be affected by any medication taken by the mother in the second month of pregnancy.
    (4) It is not affected by conditions outside the embryo.

82. Which process normally occurs at the placenta?
    (1) Oxygen diffuses from fetal blood to maternal blood.
    (2) Materials are exchanged between fetal and maternal blood.
    (3) Maternal blood is converted into fetal blood.
    (4) Digestive enzymes pass from maternal blood to fetal blood.

83. Heavy cigarette smoking and the use of alcohol throughout pregnancy usually increase the likelihood of
    (1) the birth of twins
    (2) the birth of a male baby
    (3) a baby being born with a viral infection
    (4) a baby being born with medical problems

84. Although all the body cells in an animal contain the same hereditary information, they do not all look and function the same way. The cause of this difference is that during differentiation
    (1) embryonic cells use different portions of their genetic information
    (2) the number of genes increases as embryonic cells move to new locations
    (3) embryonic cells delete portions of chromosomes
    (4) genes in embryonic body cells mutate rapidly

Base your answers to questions **85** through **88** on the information below and on your knowledge of biology.

Stem Cells

If skin is cut, the wound closes within days. If a leg is broken, the fracture will usually mend if the bone is set correctly. Almost all human tissue can repair itself to some extent. Much of this repair is due to the activity of stem cells. These cells resemble those of a developing embryo in their ability to reproduce repeatedly, forming exact copies of themselves. They may also form many other different kinds of cells. Stem cells in bone marrow offer a dramatic example. They can give rise to all of the structures in the blood: red blood cells, platelets, and various types of white blood cells. Other stem cells may produce the various components of the skin, liver, or intestinal lining.

The brain of an adult human can sometimes compensate for damage by making new connections among surviving nerve cells (neurons). For many years, most biologists believed that the brain could not repair itself because it lacked stem cells that would produce new neurons.

A recent discovery, however, indicates that a mature human brain does produce neurons routinely at one site, the hippocampus, an area important to memory and learning. This discovery raises the prospect that stem cells that make new neurons in one part of the brain might be found in other areas. If investigators can learn how to cause existing stem cells to produce useful numbers of functional nerve cells, it might be possible to correct a number of disorders involving damage to neurons such as Alzheimer's disease, Parkinson's disease, stroke, and brain injuries.

85. Describe how this new discovery concerning stem cells might help to treat diseases such as Alzheimer's disease or Parkinson's disease.

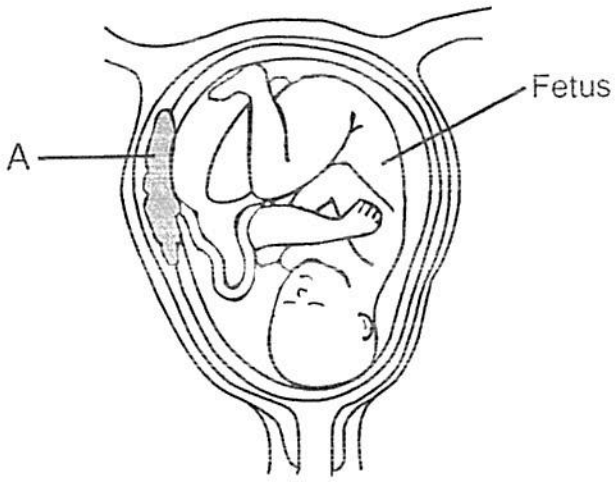
86. Until recently, many biologists thought that the brain could *not* repair itself because they thought it
    (1) could not make new connections between neurons
    (2) had DNA different from DNA in reproductive cells
    (3) could form new cells only in certain areas of the brain
    (4) lacked stem cells needed to produce new neurons

87. Stem cells may be similar to the cells of a developing embryo because both cell types can
    (1) produce only one type of cell
    (2) help the brain to learn and remember things
    (3) divide and differentiate
    (4) cause Alzheimer's and Parkinson's diseases

88. What is the process by which stem cells produce exact copies of themselves?
    (1) cell division by mitosis
    (2) cell division by meiosis
    (3) sexual reproduction
    (4) glucose synthesis

Base your answers to questions **89** and **90** on the statement and diagram below and on your knowledge of biology.

Women are advised to avoid consuming alcoholic beverages during pregnancy.



89. Explain why consumption of alcoholic beverages by a pregnant woman is likely to be more harmful to her fetus than to herself.

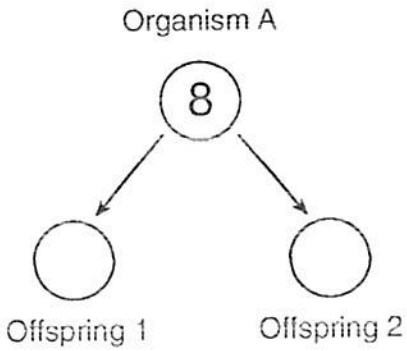
90. Identify the structure labeled *A* and explain how the functioning of structure *A* is essential for the normal development of the fetus.

Structure A: _____

_____

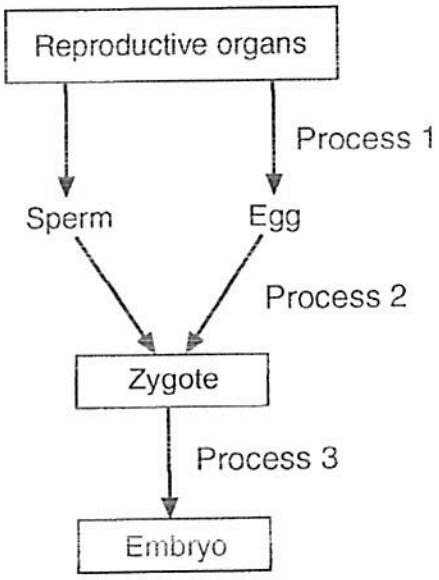
91. A human is a complex organism that develops from a zygote. Briefly explain some of the steps in this developmental process. In your answer be sure to:
- explain how a zygote is formed
- compare the genetic content of the zygote to that of a body cell of the parents
- identify one developmental process involved in the change from a zygote into an embryo
- identify the structure in which fetal development usually occurs
- identify *two* factors that can affect fetal development and explain how each factor affects fetal development

92. The diagram below represents reproduction of single-celled organism *A*, which has a normal chromosome number of 8.



In the circles representing offspring 1 and offspring 2, write the number of chromosomes that result from the normal asexual reproduction of organism *A*.

93. Base your answer to the following question on the diagram below.



State *one* difference between the cells produced by Process 1 and the cells produced by Process 3.

94. Define fertilization and describe the resulting development of a human embryo. In your answer, be sure to include a definition of fertilization and the functions of the ovary, uterus, and placenta. Circle the terms *fertilization, ovary, uterus,* and *placenta* in your description.

Answer Key

1. 1
2. 4
3. 2
4. 3
5. 1
6. 2
7. 2
8. 4
9. 1
10. 3
11. 3
12. 1
13. 1
14. 4
15. 4
16. 4
17. 1
18. 3
19. 4
20. 1
21. 1
22. 3
23. 1
24. 4
25. 3
26. 1
27. 2
28. 4
29. 3
30. 2
31. 2
32. 1
33. 1
34. 4
35. 1
36. 4
37. 2
38. 1
39. 4
40. 4
41. 4
42. 2
43. 4
44. 1
45. 2
46. 1
47. 4
48. 3
49. 4
50. 1
51. 2
52. 1
53. 1
54. 1
55. 4
56. 4
57. 1
58. 1
59. 2
60. 3
61. 4
62. 2
63. 4
64. 1
65. 1
66. 3
67. 3
68. 1
69. 3
70. 4
71. 2
72. 3
73. 4
74. 3
75. 4
76. 1
77. 3
78. 3
79. 1
80. 2
81. 2
82. 2
83. 4
84. 1

85. *Examples:* — Existing stem cells could be made to produce functional nerve cells in damaged brain areas. — Damaged neurons could be restored by the activity of stem cells.

86. 4
87. 3
88. 1

89. Responses include, but are not limited to: When the alcohol from the mother's bloodstream enters the fetus, the relative amount is much greater

due to the smaller size of the fetus; The fetus is still developing.

90. • The structure labeled *A* is the placenta.
• Exchange surface for nutrients *or* wastes *or* O_2 between mother and fetus

91. *Examples:* • Gametes fuse. — Fertilization occurs. — Sperm and egg fuse.
• The zygote is not genetically identical to a body cell of either parent. — The zygote has the same chromosome number as a body cell of the parents. — Half of the zygote's chromosomes come from each parent.
• differentiation — mitosis — cell division — cleavage
• uterus
• Alcohol can affect development of the brain. — Smoking can result in premature births/low birth weight. — Crack can cause the placenta to separate prematurely resulting in brain damage or death. — Malnutrition in the mother can result in low birth weight. — Genes will affect how the baby develops. — The amnion provides a watery environment and protection. — Good nutrition by the mother favors healthy development.

92. The chromosome number in offspring 1 and in offspring 2 is 8.

93. *Examples:*
– Cells resulting from Process 1 have half the number of chromosomes as cells produced by Process 3.
– Cells produced by Process 1 are sex cells and those produced by Process 3 are body cells.

94. *Examples:* Eggs are produced in the *ovaries*. *Fertilization* occurs when a sperm unites with an egg. An embryo forms and is implanted into the *uterus*. A *placenta* develops and helps provide nutrients for the embryo. (The placenta also provides oxygen for the embryo and it helps to remove wastes from the embryo.)