

029 Chapter 29

Student: _____

1. A triploid zygote could result from ____, the fertilization of an egg by more than one sperm.

2. A fertilized egg is called a/an ____ when the chromosomes of both parents have mingled to form a diploid set.

3. When the three primary germ layers have formed, an individual is at a stage of development called the ____.

4. For the first 8 weeks after ovulation, a conceptus depends primarily on ____ nutrition.

5. A conceptus is anchored to the endometrium by rootlike outgrowths of the syncytiotrophoblast called ____.

6. Most fetal blood in the pulmonary trunk follows a shunt to the aorta called the ____ instead of circulating through the lungs.

7. The normal head-down position of a full-term fetus is called the ____ position.

8. Respiratory distress syndrome results from a deficiency of pulmonary ____ in the lungs of a premature infant.

9. Any abnormality present at birth is called a ____.

10. Degenerative change in an organ resulting from aging is called ____.

11. Older people have more trouble with thermoregulation because they have more subcutaneous fat and cannot dissipate body heat efficiently.

True False

12. Human life expectancy has increased more than human life span in the twentieth century.

True False

13. The embryonic disc, when first formed, has no mesoderm.

True False

14. Freshly ejaculated spermatozoa are incapable of fertilizing an egg.

True False

15. The fast block to polyspermy results from a change in oocyte membrane potential.

True False

16. The cytotrophoblast is composed of cells that later become the embryo.

True False

17. The ovaries secrete increasing amounts of estrogen and progesterone in the second and third trimesters of pregnancy.

True False

18. Older people are more susceptible to herniated intervertebral discs than younger people.

True False

19. The transition from trophoblastic to placental nutrition depends on an increase in placental conductivity.

True False

20. The yolk sac is a vestigial structure with no known function in humans.

True False

21. An egg is usually fertilized by the first sperm that reaches it.

True False

22. Immaturity of the liver is a factor in the edema of premature infants.

True False

23. One hypothesis on senescence is that it results from increased cross-linking of DNA by disulfide bonds.

True False

24. Proteins exhibit more and more abnormalities in amino acid sequence with age.

True False

25. Evolutionary theorists no longer believe that a function of death is to eliminate old and frail individuals for the good of the species.

True False

Match the following terms to the definitions.

acrosin	aneuploidy
blastomeres	capacitation
carcinogen	collagenase
conception	congenital anomaly
cortical reaction	integumentary system
Klinefelter syndrome	muscular system
mutagens	nervous system
nondisjunction	polyspermy
progeria	rosacea
telomeres	teratogens
triplo-X syndrome	Turner syndrome

26. Which term can be described as the process by which spermatozoa become capable of fertilizing an egg?

27. Which term can be described as the enzyme that facilitates fertilization?

28. Which term can be described as the process that prevents too many sperm from fertilizing one egg?

29. Which term describes the cells produced by cleavage of the zygote?

30. Which term can be described as any agent that causes anatomical birth defects?

31. Which term can be described as the failure of two homologous chromosomes to separate in meiosis?

32. Which term can be described as the organ system directly affected by photoaging?

33. Which term describes the visible networks of dilated blood capillaries, especially common on the face?

34. Which term can be described as the syndrome in which senescence is greatly accelerated?

35. Which term can be described as the results from an XO condition in the zygote?

36. Most fetal blood bypasses the liver by way of a shunt called

- A. the ductus venosus.
- B. the ductus arteriosus.
- C. the foramen ovale.
- D. the umbilical vein.
- E. the fossa ovalis.

37. At 5 months gestation, a fetus is covered with a cheesy sebaceous secretion called

- A. meconium.
- B. lanugo.
- C. vernix caseosa.
- D. smegma.
- E. uterine milk.

38. An XXY combination of sex chromosomes produces an individual with

- A. metafemale syndrome.
- B. Down syndrome.
- C. Turner syndrome.
- D. Klinefelter syndrome.
- E. hermaphroditism.

39. The skin and hair become drier in old age because of

- A. senescence of the sebaceous glands.
- B. the cross-linking of collagen.
- C. senescence of the sweat glands.
- D. the loss of dermal blood vessels.
- E. an increased amount of keratin.

40. The capacitation of sperm involves

- A. formation of the acrosome.
- B. the acrosomal reaction.
- C. the cortical reaction.
- D. the development of motility.
- E. the removal of cholesterol from the plasma membrane.

41. The embryonic membranes include all of the following except

- A. the yolk sac.
- B. the placenta.
- C. the allantois.
- D. the chorion.
- E. the amnion.

42. Which of these lists the stages of prenatal development in correct order?

- A. cleavage, zygote, morula, trophoblast, embryo, fetus
- B. zygote, morula, cleavage, embryo, trophoblast, fetus
- C. zygote, cleavage, morula, trophoblast, embryo, fetus
- D. zygote, embryo, morula, cleavage, trophoblast, fetus
- E. embryo, zygote, cleavage, morula, trophoblast, fetus

43. Cortical granules

- A. enable a sperm to penetrate an egg.
- B. prevent too many sperm from penetrating one egg.
- C. release ACTH from the adrenal cortex.
- D. are primordial follicles in the ovarian cortex.
- E. appear in the senescent adrenal cortex.

44. Which of these is not part of the preembryonic stage of development?

- A. cleavage
- B. implantation
- C. development of ectoderm and endoderm
- D. differentiation of organs
- E. trophoblastic nutrition

45. The criterion for when a human embryo exists is that

- A. the zygote has divided into two or more cells.
- B. the trophoblast and embryoblast have differentiated from each other.
- C. the conceptus has implanted in the uterine wall.
- D. the three primary germ layers have formed.
- E. the first traces of all the organ systems are evident.

46. The digital rays of a fetus give rise to

- A. arms and legs.
- B. fingers and toes.
- C. ribs and intercostal muscles.
- D. extensor digitorum muscles.
- E. radial muscles of the iris.

47. The fine hair on the body of a 5-month-old fetus is

- A. lanugo.
- B. vellus.
- C. vernix.
- D. meconium.
- E. colostrum.

48. The neonatal period of life is considered to extend to an age of
- A. 6 to 8 hours.
 - B. 24 hours.
 - C. 2 weeks.
 - D. 6 weeks.
 - E. 1 year.
49. The round ligament of the adult liver is a remnant of the ____ of the fetus.
- A. allantois
 - B. falciform ligament
 - C. medial umbilical ligament
 - D. umbilical vein
 - E. ductus venosus
50. During or immediately after birth, an infant is normally stimulated to breathe by
- A. the accumulation of CO₂ in the blood.
 - B. the high O₂ level in the room air.
 - C. prostaglandins.
 - D. pulmonary surfactant.
 - E. pinching or spanking it.
51. Premature infants have many physiological problems. All of the following except ____ are traceable to the immaturity of the liver.
- A. jaundice
 - B. edema
 - C. slow blood clotting
 - D. hypothermia
 - E. hypoproteinemia
52. A teratogen is most likely to cause
- A. a malformed head.
 - B. aneuploidy.
 - C. childhood cancer.
 - D. nondisjunction.
 - E. trisomy-21.

53. Down syndrome (trisomy-21) results from
- A. a mutagen.
 - B. nondisjunction.
 - C. a teratogen.
 - D. a sex-linked mutation.
 - E. an autosomal recessive allele.
54. Muscular weakness tends to develop in old age for all of the following reasons except
- A. a reduced number of spinal motor neurons.
 - B. replacement of muscle fibers with collagen and fat.
 - C. slower conduction speeds in the motor nerve fibers.
 - D. reduced perfusion of the muscles.
 - E. smaller, less efficient mitochondria.
55. Which of the following organ systems exhibits the least senescence with age?
- A. urinary
 - B. muscular
 - C. skeletal
 - D. circulatory
 - E. endocrine
56. A healthy person of age 65, compared to one of age 25, will typically show significant differences in all of the following except
- A. blood pressure.
 - B. perfusion of the organs.
 - C. RBC count.
 - D. stroke volume.
 - E. cardiac output.
57. Older people may require lower drug doses than younger people because
- A. they have lower rates of renal clearance.
 - B. their organs are more sensitive to drugs.
 - C. they do not absorb as much drug from the small intestine.
 - D. there is less tissue mass to treat.
 - E. a lifetime of mutations results in unpredictable drug reactions.

58. Urine retention is a greater problem for elderly men than for elderly women because men
- A. have fewer glomeruli.
 - B. have stronger urinary sphincters.
 - C. usually develop benign prostatic hyperplasia.
 - D. have larger bladders.
 - E. are more sensitive to ADH.
59. Of the following, the least likely or significant effect of endurance (aerobic) exercise in old age is
- A. increased oxygen uptake.
 - B. increased muscle mass.
 - C. reduced body fat.
 - D. stronger bones.
 - E. increased cardiac output.
60. Telomeres
- A. are cytoplasmic enzymes involved in senescence.
 - B. are antioxidants that slow the progress of senescence.
 - C. are DNA segments at each end of a chromosome.
 - D. are proteins that cap the ends of the chromosomes.
 - E. are motor molecules that guide embryonic cells to the right destinations.
61. When a developing individual arrives in the uterus,
- A. it is in the form of a zygote.
 - B. it consists of about 16 to 32 cells.
 - C. it has 3 primary germ layers.
 - D. it shows traces of all the organ systems.
 - E. it is called a trophoblast.
62. The ___ anchor(s) a conceptus to the uterine wall.
- A. cytotrophoblast
 - B. syncytiotrophoblast
 - C. embryoblast
 - D. blastomeres
 - E. telomeres

63. The fetal colon accumulates thick, tarry feces called
- A. lanugo.
 - B. vernix caseosa.
 - C. meconium.
 - D. colostrum.
 - E. lochia.
64. Prior to implantation, the conceptus is nourished by
- A. uterine milk.
 - B. vaginal transudation.
 - C. trophoblastic nutrition.
 - D. decidual cells.
 - E. the placenta.
65. Which of the following is closest to the fetus?
- A. the myometrium
 - B. the amnion
 - C. the smooth chorion
 - D. the villous chorion
 - E. the placental sinus
66. All of the following arise from the embryonic mesoderm except
- A. the nervous system.
 - B. the blood vessels.
 - C. the mesothelium.
 - D. the skeletal system.
 - E. the dermis.
67. Which of these arises from the embryonic endoderm?
- A. the epidermis
 - B. the salivary glands
 - C. the bone marrow
 - D. the pituitary gland
 - E. the digestive mucosa

68. An individual becomes a fetus at the end of ____ of gestation.
- A. 48 hours
 - B. 10 days
 - C. 8 weeks
 - D. 12 weeks
 - E. 5 months
69. Which of these organ systems shows the greatest structural change in the transitional period after birth?
- A. muscular
 - B. respiratory
 - C. skeletal
 - D. circulatory
 - E. nervous
70. A sterile male with undeveloped testes, overdeveloped breasts, and unusually long arms and legs is most likely to have
- A. trisomy-21.
 - B. Turner syndrome.
 - C. Klinefelter syndrome.
 - D. fetal alcohol syndrome.
 - E. Down syndrome.
71. In order for an egg to survive, it must be fertilized within _____ hours of ovulation.
- A. 1 to 10
 - B. 12 to 24
 - C. 30 to 50
 - D. 72
 - E. 25 to 29
72. Out of about 300 million sperm that are ejaculated, _____ sperm reach the vicinity of the egg.
- A. 300
 - B. 3,000
 - C. 30,000
 - D. 300,000
 - E. 3 million

73. Spermatozoa cannot fertilize an egg for about _____ hour(s), and most sperm are fertile for a maximum of about _____ hours after ejaculation.
- A. 1; 24
 - B. 5; 36
 - C. 10; 48
 - D. 15; 72
 - E. 7; 40
74. A couple is trying to conceive a child. The best chance of fertilizing an egg is _____ hour(s) before ovulation to _____ hours after ovulation.
- A. 1; 10
 - B. 10; 72
 - C. 14; 48
 - D. 48; 14
 - E. 32; 10
75. Prior to ejaculation, the sperm head contains _____, which prevents premature release of _____.
- A. cholesterol; acrosomal enzymes
 - B. protein; acrosomal enzymes
 - C. carbohydrates; prostaglandins
 - D. hyaluronic acid; prostaglandins
 - E. lipids; prostaglandins
76. In order to fertilize the egg, spermatozoa must release the enzymes hyaluronidase and acrosin that erode away two layers around the egg called the _____.
- A. corpus luteum and corpus albicans.
 - B. stratum basalis and stratum functionalis.
 - C. corona radiata and zona pellucida.
 - D. theca externa and theca interna.
 - E. cumulus oophorus and theca interna.

77. In the fast block mechanism to prevent polyspermy, the _____ channels open, which prevents any more sperm from entering the egg by _____ the egg membrane.
- A. Cl^- ; hyperpolarizing
 - B. K^+ ; hyperpolarizing
 - C. Na^+ ; depolarizing
 - D. Ca^{2+} ; depolarizing
 - E. Mg^{2+} ; depolarizing
78. In the slow block mechanism in eggs to prevent polyspermy, the _____ channels open in the egg membrane that create the _____.
- A. Cl^- ; corona radiata
 - B. K^+ ; zona pellucida
 - C. Na^+ ; fertilization membrane
 - D. Ca^{2+} ; fertilization membrane
 - E. Na^+ ; cumulus oophorus
79. In males, meiosis II is completed in the _____, and in females, meiosis II is completed in the _____.
- A. seminiferous tubule; ovary
 - B. seminiferous tubule; uterine tube
 - C. epididymis; ovary
 - D. epididymis; uterine tube
 - E. epididymis; uterus
80. Which one of the below is a diploid (2n)?
- A. second polar body
 - B. female pronucleus
 - C. male pronucleus
 - D. zygote
 - E. spermatid

81. Twins produced when a single egg is fertilized are called _____ twins, and twins produced from two eggs that are ovulated are called _____ twins.
- A. monozygotic; identical
 - B. dizygotic; non-identical
 - C. monozygotic; dizygotic
 - D. dizygotic; monozygotic
 - E. non-identical; identical
82. The morula lies free in the uterine cavity for four to five days. At about 100 cells, the zona pellucida disintegrates and releases the conceptus. The stage is now called the _____.
- A. blastocyst.
 - B. trophoblast.
 - C. embryoblast.
 - D. syncytiotrophoblast.
 - E. zygote.
83. In the blastocyst, the trophoblast will become _____, and the embryoblast will become _____.
- A. part of the placenta; the yolk sac
 - B. part of the placenta; the embryo
 - C. the embryo; part of the placenta
 - D. the embryo; the yolk sac
 - E. the yolk sac; the embryo
84. During implantation about six days after ovulation, the trophoblast forms a deep layer that retains individual cells called the _____ and a superficial layer composed of a multinucleate mass of cells whose plasma membranes broke down called the _____.
- A. chorion; amnion
 - B. chorion; embryoblast
 - C. syncytiotrophoblast; cytotrophoblast
 - D. cytotrophoblast; syncytiotrophoblast
 - E. embryoblast; amnion

85. Implantation begins about ____ days after ovulation and is completed in about ____ week(s).
- A. 6; 1
 - B. 6; 2
 - C. 14; 1
 - D. 14; 2
 - E. 10; 1
86. The trophoblast secretes _____ and develops into a membrane called the _____.
- A. estrogen and progesterone; chorion
 - B. human chorionic gonadotropin (HCG); amnion
 - C. human chorionic gonadotropin (HCG); chorion
 - D. estrogen and progesterone; amnion
 - E. human chorionic somatomammotropin (HCS); amnion
87. During embryogenesis, the embryoblast flattens into an embryonic disc composed of
- A. ectoderm and endoderm.
 - B. ectoderm and mesoderm.
 - C. endoderm and mesoderm.
 - D. ectoderm, endoderm, and mesoderm.
 - E. endoderm and epiderm.
88. If the blastocyst implants in the uterine tube instead of the uterus, the pregnancy is called
- A. neonatal.
 - B. ectodermic.
 - C. endodermic.
 - D. ectopic.
 - E. premature.
89. At eight weeks, the embryonic stage has transitioned to the fetal stage because
- A. all the germ layers are formed.
 - B. the amniotic cavity has formed.
 - C. the germ layers have differentiated into organs and organ systems.
 - D. the notochord and yolk sac have formed.
 - E. the mesoderm has formed.

90. Glucose crosses the placenta by _____, and amino acids cross the placenta by _____.
- A. facilitated diffusion; active transport
 - B. active transport; facilitated diffusion
 - C. active transport; receptor-mediated endocytosis
 - D. simple diffusion; receptor-mediated endocytosis
 - E. facilitated diffusion; simple diffusion
91. In amniocentesis, a sample of amniotic fluid is removed, and the fetal cells are analyzed. Over 20 congenital conditions can be identified by this procedure. Amniocentesis is best done during what time frame of pregnancy?
- A. 10 days
 - B. 2 to 8 weeks
 - C. 14 to 15 weeks
 - D. 30 to 31 weeks
 - E. 9 to 13 weeks
92. The skeleton, most muscles, dermis, blood, and blood vessels arise from
- A. epiderm.
 - B. ectoderm.
 - C. endoderm.
 - D. mesoderm.
 - E. mesothelium.
93. The epidermis, nervous system, pituitary, internal and external ear are derived from
- A. epiderm.
 - B. ectoderm.
 - C. endoderm.
 - D. mesoderm.
 - E. mesothelium.

94. The epithelia of the digestive tract, respiratory tract, urinary bladder, and accessory reproductive and digestive system glands are derived from
- A. epiderm.
 - B. ectoderm.
 - C. endoderm.
 - D. mesoderm.
 - E. mesothelium.
95. In the fetal circulation, the ____ bypasses the liver, and the ____ bypasses the lungs.
- A. ligamentum venosum; ligamentum arteriosum
 - B. foramen ovale; ductus venosus
 - C. ductus arteriosus; ductus venosus
 - D. ductus venosus; ductus arteriosus
 - E. ligamentum arteriosus; foramen ovale
96. A newborn infant is screened for this disorder, which prevents the individual from producing the amino acid tyrosine, a critical amino acid for the formation of melanin, EP, NE, thyroid hormones, and dopamine.
- A. phenylketonuria
 - B. Down syndrome
 - C. respiratory distress syndrome
 - D. fetal alcohol syndrome
 - E. hypothyroid disorder
97. The immune responses of a neonate are weak. However, the mother supplies ____ through the placenta and ____ through the colostrum.
- A. IgD; IgE
 - B. IgM; IgG
 - C. IgA; IgE
 - D. IgG; IgA
 - E. IgE; IgM

98. Jaundice is common in prenatals, especially premature babies because of the buildup in the blood of

- A. iron.
- B. bilirubin.
- C. cholesterol.
- D. melanin.
- E. urochrome.

99. One of the major factors that contributes to osteopenia, or loss of bone, in the elderly is the

- A. significant decrease of cutaneous vitamin D production.
- B. two-thirds decline in cutaneous nerve endings.
- C. 40% decline in dendritic cells in the epidermis.
- D. loss of cutaneous blood vessels, sweat glands, and subcutaneous fat.
- E. increased exposure to the sun.

100. An older person is less protected against cancer and infectious diseases because of the decline of

- A. alpha and beta globulins.
- B. red blood cells and platelets.
- C. antigen-presenting cells and helper T cells.
- D. prothrombin and fibrinogen.
- E. complement proteins.

029 Chapter 29 Key

1. polyspermy
2. zygote
3. embryo
4. trophoblastic
5. chorionic villi
6. ductus arteriosus
7. vertex
8. surfactant
9. congenital anomaly
10. senescence
11. FALSE
12. TRUE
13. TRUE
14. TRUE
15. TRUE
16. FALSE
17. FALSE
18. FALSE
19. TRUE
20. FALSE
21. FALSE

22. TRUE
23. FALSE
24. FALSE
25. TRUE
26. capacitation
27. acrosin
28. cortical reaction
29. blastomeres
30. teratogens
31. nondisjunction
32. integumentary system
33. rosacea
34. progeria
35. Turner syndrome
36. A
37. C
38. D
39. A
40. E
41. B
42. C
43. B

44. D

45. D

46. B

47. A

48. D

49. D

50. A

51. D

52. D

53. B

54. C

55. E

56. C

57. A

58. C

59. D

60. C

61. B

62. B

63. C

64. A

65. B

66. A

67. E

68. C

69. D

70. C

71. B

72. B

73. C

74. D

75. A

76. C

77. C

78. D

79. B

80. D

81. C

82. A

83. B

84. D

85. A

86. C

87. A

88. D

89. C

90. A

91. C

92. D

93. B

94. C

95. D

96. A

97. D

98. B

99. A

100. C