Name _____ Due Date _____

Reproduction Review Packet

Meiosis and human reproductive System

A. Introduction

1. Define reproduction

production of more individuals of the SAME kind

2. Reproduction is not necessary to sustain the life of an individual but is still considered a life function, explain why.

An individual does not need to reproduce to survive but the species needs reproduction to continue

3. What are the two basic types of reproduction

Asexual sexual

4. Define Asexual reproduction

reproduction without the fusion of gametes (one parent, identical to parent)

   a. Advantages: fast, no need to find mate, preserve a good trait
   b. Disadvantages: No variation

5. Define Sexual reproduction

reproduction that involves the fusion of gametes (two parents, combo of parents)

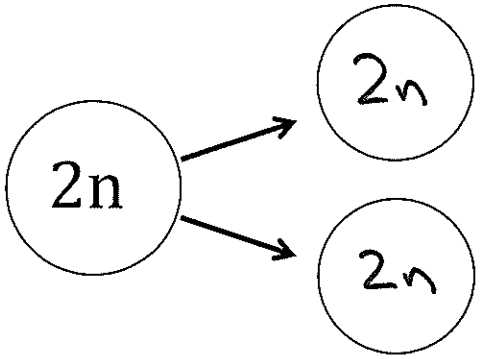
   a. Advantages: variation among offspring
   b. Disadvantages: takes longer, must find a mate

B. Asexual Reproduction

6. Asexual reproduction is also known as cell division, this process has 2 parts;

mitosis (division of the nucleus) and cytoplasm (division of the cytoplasm) but is typically just called mitosis.

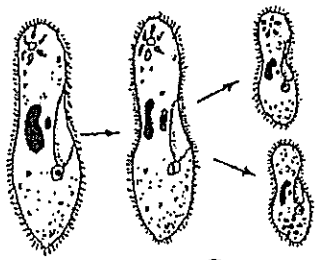
7. Complete the following diagram of a cell dividing by mitosis:

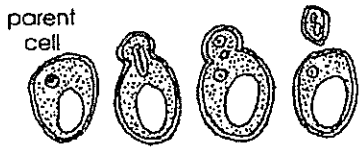


8. Describe the number and type of cells that result from mitosis (daughter cells)

2 identical diploid cells are produced

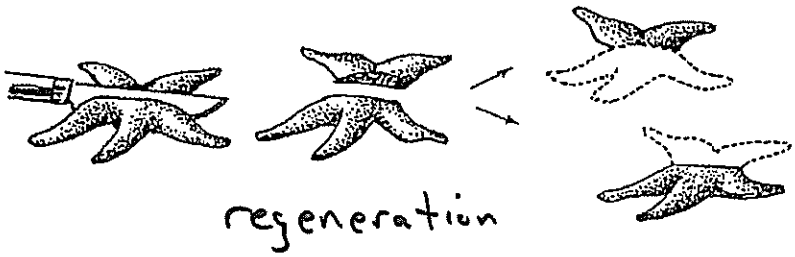
9. Label the various types of asexual reproduction below:

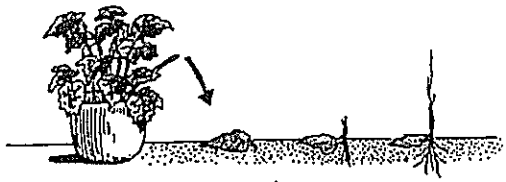

binary fission



budding

sporulation


regeneration


vegatative propagation

10. What do all the various types of asexual reproduction have in common?

They all produce offspring identical to parent

11. Multicellular complex organisms use mitosis for growth and repair

C. Sexual Reproduction

12. Requires the fusion of gametes (sex cells)

13. Gametes are produced by a special type of cell division called meiosis, in this process one diploid cell divides 2 times to produce 4 haploid cells.

14. Like all somatic cells (body cells) the primary sex cells contain 2 complete sets of chromosomes and are diploid (2n) but the mature sex cells are haploid (n)

15. Describe what makes homologous chromosomes

They are similar in size, similar in shape and have genes for the same traits

16. The process that sets meiosis apart from mitosis is the formation of tetrads during synapsis. At this time, genes are passed between homologs, this is called crossing over.

17. disjunction is the process that separate the tetrads and results in one double stranded homolog in each new cell.

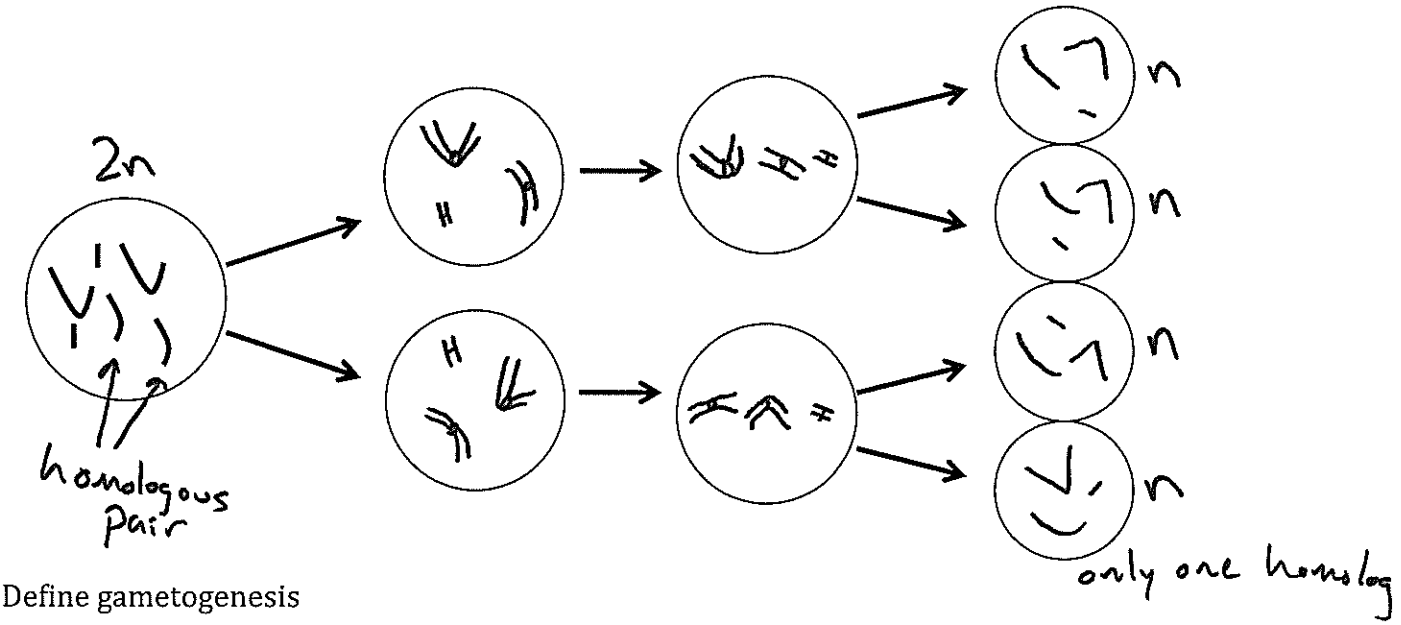
18. Describe the number and type of cells that result from meiosis

4 haploid cells are produced, each slightly different

19. How are haploid cells different from diploid cells

They only contain one chromosome from each homologous pair

20. Complete the following diagram of a cell dividing by meiosis



21. Define gametogenesis

The production of gametes by meiosis (sex cells)

22. Explain the differences between oogenesis and spermatogenesis

° spermatogenesis	° oogenesis
happens constantly	occurs once a month
produces 4 viable sperm	produces 1 ovum 3 polar body
occurs in testes	occurs in ovary
occurs below body temp.	occurs at body temp.

D. Male Reproductive System

23. The male gonads are the testes

24. List two substances produced by the male gonads:

testosterone sperm

25. The testes are located outside the body within a sac of skin called the scrotum

26. Why are the testes outside of the body?

They must be 2° below body temp. to produce viable sperm. Scrotum regulates body temp.

27. Sperm mature in the upper part of each testicle called the epididymis

28. The tube that connects the epididymis to the urethra is called the vas deferens

29. What is the difference between semen and sperm?

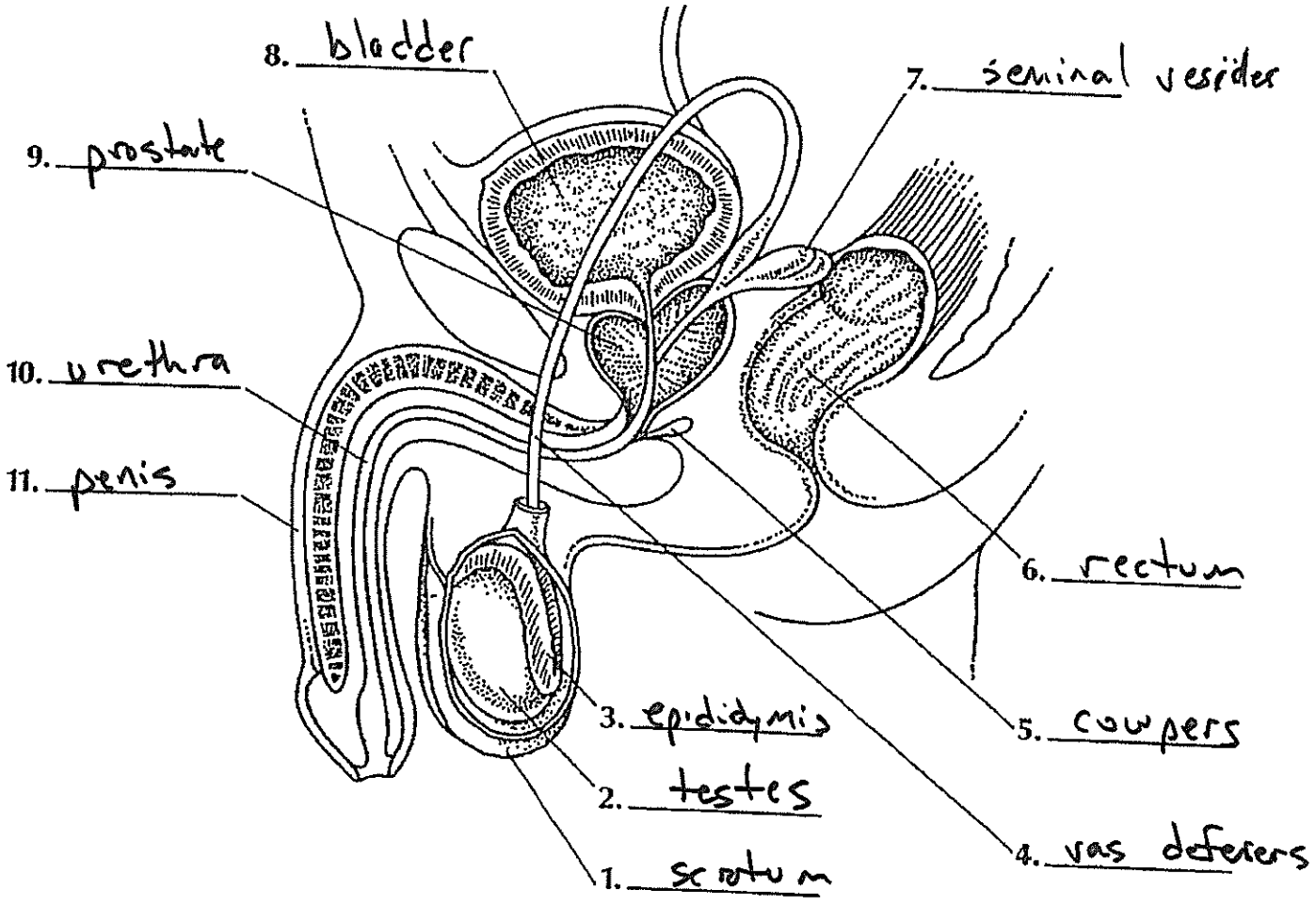
semen is the fluid medium sperm swim in.

30. Involuntary muscle contractions that forces semen through the urethra and out of the penis is called ejaculation

31. The three glands that add fluid to the sperm during ejaculation are seminal vesicles, cowpers gland and prostate

32. Besides semen, what other fluid travels through a male's urethra? urine

33. Label the following diagram



B. Female reproductive system

34. The female gonads are the ovaries

35. The female gonads produce the female gametes called ovum / ova

36. They also produce the female sex hormone estrogen

37. Each Ovary contains over 400,000 tiny egg sacs known as follicles

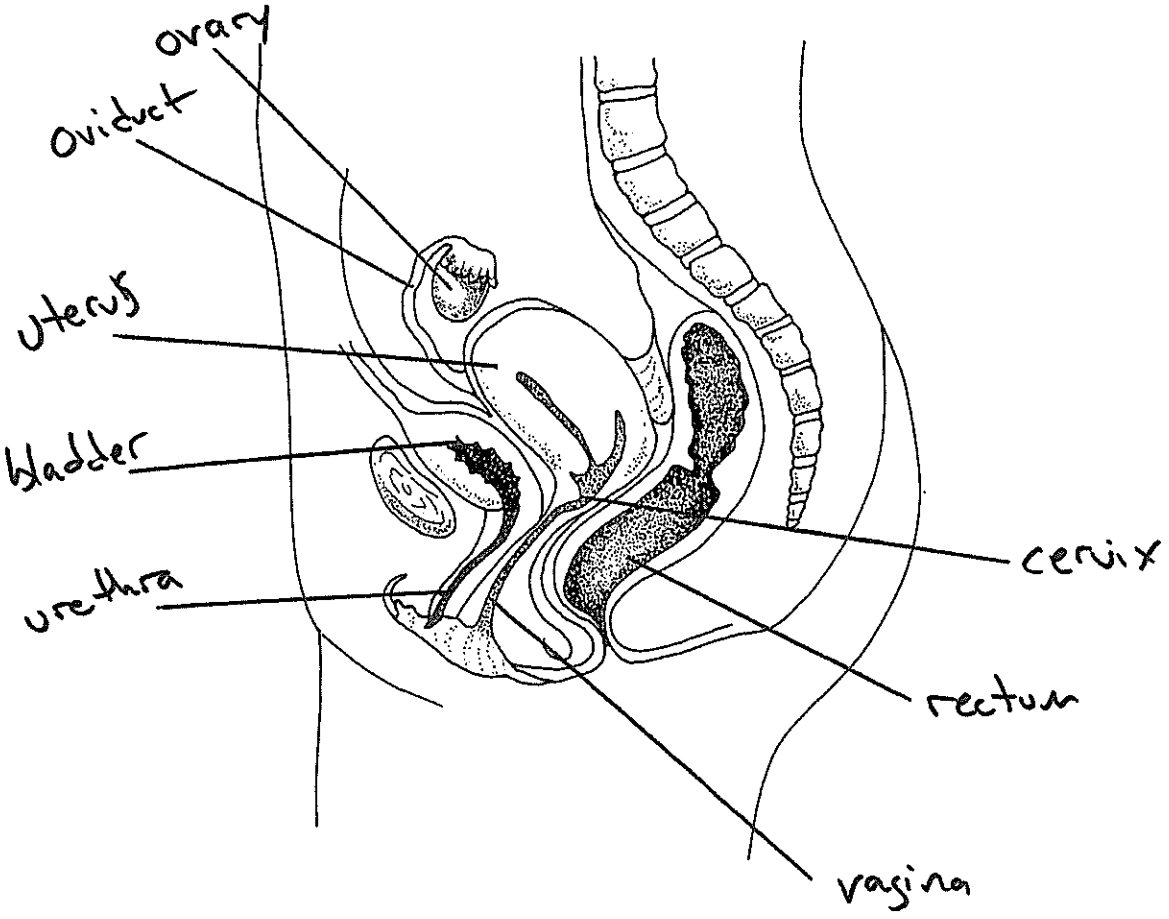
38. Near each ovary, but not attached is a fallopian tube or oviduct. this leads to a thick walled muscular organ where a fetus may develop called the uterus. The lining of this organ is called the endometrium.

39. The opening at the base of the uterus is called the cervix and plays a role in regulating semen entering the uterus

40. The passageway where semen is deposited is called the vagina (birth canal)

41. Unlike males, females have a separate opening for the elimination of urine called the urethra.

42. Label the diagram below:



C. The menstrual Cycle

43. Approximately how long does one menstrual cycle last? 28 days

44. What two hormones does the pituitary produce? FSH & LH (affect ovary)

45. What two hormones do the ovaries produce? progesterone & estrogen (affect uterus)

46. The first stage of the menstrual cycle is called the Follicle stage. During this stage the pituitary gland secretes a hormone called FSH which causes several follicles to mature

47. As the follicle develops it secretes a hormone called estrogen which stimulates the uterine lining to develop/grow. When the level of this hormone gets high, it signals the pituitary to stop releasing FSH. This is a example of a negative feedback loop

48. What are the events in number 46 and 47 preparing for? Fertilization / pregnancy

49. the second stage of the menstrual cycle is called ovulation. High levels of estrogen cause the pituitary to release a hormone called LH. This hormone causes the follicle to release a mature ovum. This is known as ovulation

~~& corpus luteum to develop & produce progesterone~~

50. The third stage of the menstrual cycle is known as the luteal stage. After ovulation. LH causes the broken follicle to fill with cells forming a yellow body known as the corpus luteum. This newly formed structure beings secreting the hormone progesterone, which maintains the thick uterine lining.

51. The fourth stage of the menstrual cycle only occurs if the ovum is not fertilized. It is called Menstruation and is the shedding of the uterine lining. If the egg is not fertilized then the corpus luteum begins to break down reducing levels of progesterone causing the release of the uterine lining

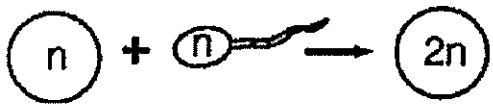
52. During menstruation, the levels of estrogen decrease which signals the pituitary to begin releasing FSH again. Starting the cycle over.

D. Fertilization and development

53. Define fertilization

The fusion of gametes to produce a zygote

54. In this process, a sperm with the haploid (n) number of chromosomes fuses with an ovum with the haploid (n)number of chromosomes to produce a zygote with the diploid (2n) number of chromosomes



55. Where does fertilization take place? oviduct

56. The zygote begins a series of mitotic cell division known as cleavage

57. The divisions result in a solid ball of cells called a morula

58. Explain why the cells become smaller and smaller during cleavage

They are replicating/dividing w/o growing (no nutrients available)

59. As the cells continue to divide by Mitosis, they rearrange to form a hollow, single layered sphere called a blastula

60. During the process of gastrulation, the cells on one side move inward to form a two layered structure called the gastrula

61. Eventually three germ layers form, list them below

ectoderm Mesoderm endoderm

62. The changing of unspecialized cells into specialized cells is called differentiation

63. What does each embryonic germ layer develop into:

a. ectoderm - skin nervous system (brain spine eyes)

b. Mesoderm - muscles bones organs

c. endoderm - lining of digestive & respiratory systems

64. Briefly explain how cells differentiate into highly specialized cells such as red blood cells, neurons, muscle cells etc.

Different cells express different genes, all cells have the same genes but only "use" the genes they need to make the proteins they use.

65. The fastening of the embryo into the wall of the uterus is called implantation

66. Briefly describe the function of the following extra-embryonic membranes:

a. chorion

b. placenta nutrients & wastes diffuse b/t mothers & babies blood

c. umbilical cord carries babies blood to & from the placenta

d. amniotic fluid protects & cushions the baby. helps properly form internal "tubes"

67. The length of pregnancy is known as the gestation period, and lasts a little over nine months.

68. The order a human develops is as follows: Zygote (DAY 1) → Embryo (8 wks) → Fetus → Birth

69. Explain the difference between fraternal twins and identical twins.

Fraternal twins are from 2 different eggs and two different sperm. Siblings with the same birthday. genetically different

Identical twins are from one sperm & one egg that splits after fertilization. genetically identical.

70. Which type of reproduction produces variety in offspring, sexual or asexual? Explain

71. The placenta transfers nutrients and oxygen from the mother's blood into the blood of the fetus through the process of diffusion.

a. The blood of the mother and fetus do NOT mix.

b. The fetus is attached to the placenta by the umbilical cord.

c. Waste produced by the fetus is also removed by the placenta.

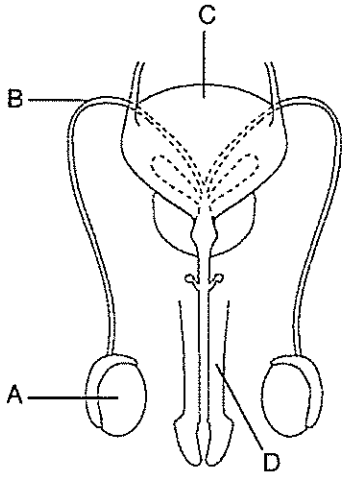
d. Waste (CO_2, urea, salts) diffuse from placenta into mother's blood.

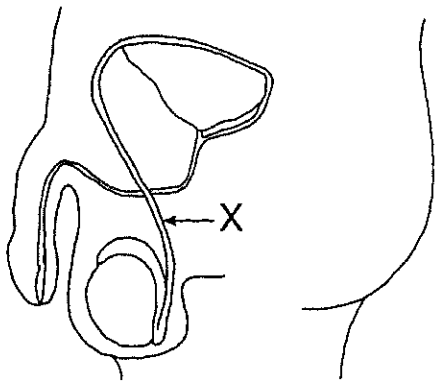
e. Since the fetus does not eat solid food, it does not have to eliminate feces.

72. The child is vulnerable to alcohol, drugs, etc. because organs and systems are still developing.

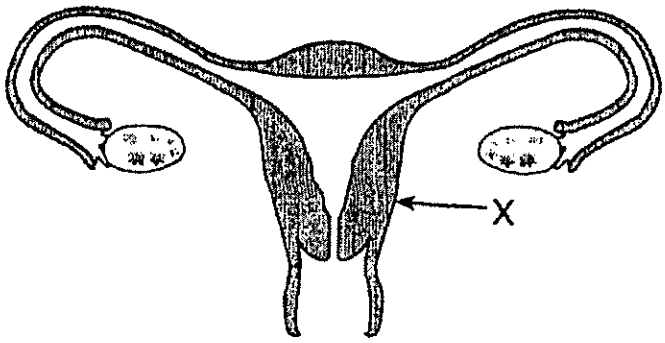
LABEL THE FOLLOWING DIAGRAMS

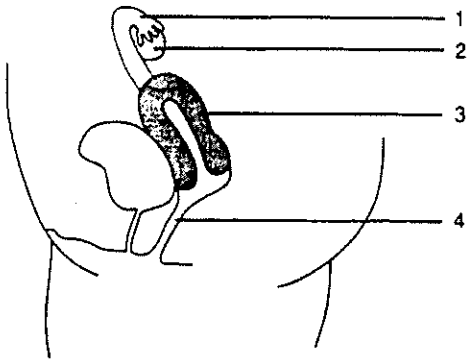
Front and side views of the male reproductive systems:



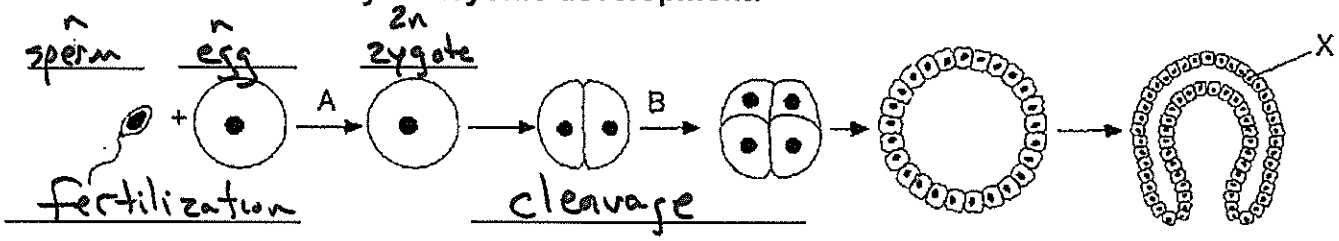


Front and side views of the female reproductive systems:

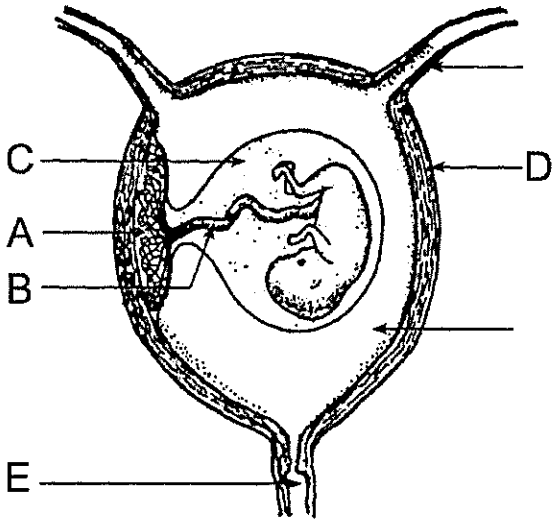




Fertilization and early embryonic development:



Later development of fetus:



Ready for birth: