

Part 5 Human Reproduction, Development, and Inheritance

20 The Reproductive System

I. Chapter Outline

- A. The Male Reproductive System
 - 1. Testes: Millions of Sperm Daily
 - 2. Genital Tract: Testes to Glans Penis
 - 3. Male Orgasm: Upon Ejaculation
 - 4. Regulating Male Hormone Levels
- B. The Female Reproductive System
 - 1. Ovaries: An Egg a Month
 - 2. Genital Tract: Oviducts to Vagina
 - 3. Female Orgasm: Wide Variety
 - 4. Regulating Female Hormone Levels
- C. The Control of Reproduction
 - 1. Birth Control: Variety of Methods
 - 2. Infertility: One Out of 4 Couples
- D. Sexually Transmitted Diseases
 - 1. AIDS: By 2000, 40 Million to Be Infected
 - 2. Genital Herpes: Estimated 500,000 New Cases per Year
 - 3. Genital Warts: Linked to Cancer
 - 4. Gonorrhea: Early Detection Difficult in Women
 - 5. Chlamydia: Risking PID and Sterility
 - 6. Syphilis: Three Stages

II. Chapter Outline

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| 370 | 1. Compare the sperm to the egg regarding size, number, and amount of cytoplasm present. |
| | 2. Why does sterility result if the testis fails to descend into the scrotum? |
| 371 | 3. Which tubule produces sperm? List the types of cells used to make sperm. Are they haploid or diploid? |
| 372 | 4. What is the function of Sertoli cells? |
| | 5. List the parts of a mature spermatozoan. What is the function of the acrosome? |
| | 6. Give the general name for male sex hormones. What cell secretes testosterone? |
| | 7. Where do sperm develop their swimming ability? List the tubules (ducts) that the sperm travel through. |
| | 8. What are the spermatic cords composed of? Where does the spermatic cord pass into the abdomen? What is a hernia? |
| | 9. List the 3 accessory glands that contribute to the formation of the seminal fluid. Which one surrounds the urethra and in older men may make urination painful? |
| | 10. What function(s) do fructose and prostaglandins have? |
| | 11. Define circumcision and smegma. |
| 373 | 12. Blood sinuses within the erectile tissue of the penis fill with _____ during erection. |
| | 13. Define the term <i>orgasm</i> . How many sperm are released during ejaculation? |
| | 14. What part of the brain has ultimate control of the testes' sexual function? Name the hormone released from this part of the brain. What endocrine tissue will this hormone stimulate? |
| | 15. The anterior pituitary secretes the gonadotropic hormone _____ that promotes spermatogenesis in the seminiferous tubules. LH (or ICSH) promotes the production of _____ in the _____ cells. What hormone will block FSH secretion when produced from the seminiferous tubules? |
| 374 | 16. List 8 different functions of testosterone. |
| 375 | 17. Compare the number of follicles that a female is born with to the number that will mature. |
| 376 | 18. Name the 2 cells that the primary oocyte will form meiotically. How many chromosomes are in these daughter cells? What is the name given to an enlarged secondary oocyte? |
| | 19. Define ovulation. What happens to a follicle after it has lost its-egg? Name the 2 hormones produced from the follicle and corpus luteum. |
| 377 | 20. What is the role of the fimbriae and cilia in the oviduct? What events normally occur in the oviduct? |
| | 21. Define an ectopic pregnancy. What normally takes place in the uterus? What layer participates in the |

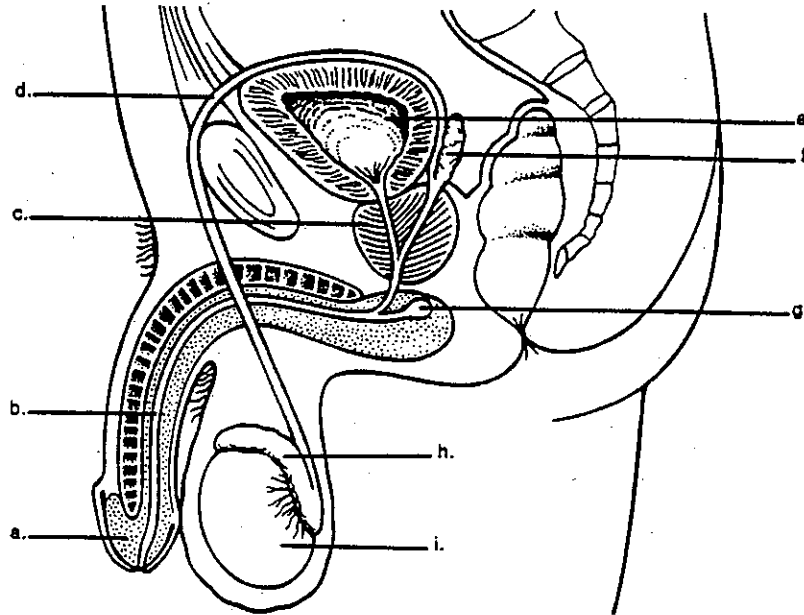
- formation of the placenta? Name the test that is used to detect cancer of the cervix.
- 377 22. What is the difference between a hysterectomy and an ovariectomy? Give 2 functions of the vagina.
- 378 23. Which external genitalia (vulva) organ: (a) is external to the labia minora? (b) forms the foreskin of the clitoris? (c) is homologous to the penis of the male? The vagina is partially closed by the _____.
24. During the ovarian follicular phase (days 1 - 13), _____ from the anterior pituitary promotes the development of a follicle in the ovary, which is secreting _____. As estrogen blood levels rise, it exerts feedback control over the anterior pituitary secretion of _____.
25. During the luteal phase of the ovarian cycle (days 15 - 28), the anterior pituitary secretion of _____ will promote the development of a _____ in the ovary, which secretes _____. This hormone exerts negative feedback control over the anterior pituitary secretion of _____.
- 379 26. During days 1 - 5 of the uterine cycle, what causes the disintegration of the uterine lining and the rupture of blood vessels? Define menses. What hormone causes the proliferative phase of the uterine cycle?
- 380 27. When does ovulation occur? What hormone causes the endometrium to become thicker and secretory during days 15 - 28? Where does this hormone come from?
- 381 28. Discuss positive feedback regulation on the hypothalamus.
29. Define implantation. What hormone from the membrane surrounding the embryo prevents degeneration of the corpus luteum?
30. What does the placenta originate from? List 3 - 4 functions of the placenta.
31. Name the hormone that is used to test for pregnancy. How soon can it be used to detect pregnancy? List the physical signs of pregnancy.
32. List 5 different effects of estrogen upon the female.
- 382 33. Name the blind sacs at the end of ducts in the breast. What is the difference between colostrum and milk?
34. What function does prolactin and oxytocin have?
35. During menopause, what happens to the hormones that are produced from the anterior pituitary and ovary?
- 383 36. Name the birth control method that involves: (a) cutting and tying the vas deferentia; (b) cutting and tying the oviducts; (c) taking estrogen and/or progesterone daily; (d) blocks entrance of sperm into uterus by a cup; (e) traps sperm by a rubber sheath over an erect penis.
- 384 37. How does the pill RU-486 and inhibin act?
- 385 38. List several factors that can cause infertility. Define endometriosis. What hormone, extracted from the urine of postmenopausal women, can cause multiple ovulations?
39. What is the difference in technique between the alternative reproductive methods of AID, IVF, and GIFT?
- 386 40. What do the initials AIDS stand for? What is the cause of AIDS and what cells are affected by it?
41. How is AIDS transmitted? What type of individuals in U.S. has the greatest chance of contracting AIDS?
- 388+ 42. List the causative agent in each of the following sexually transmitted diseases: (a) genital herpes; (b) gonorrhea; (c) chlamydia; (d) syphilis.

III. Objective Chapter Test

Completion and Short Answer Questions

- FSH in the male stimulates the (a) _____ of the testis to produce sperm, but in the female FSH stimulates (b) _____ within the ovary to produce an egg.
- The _____ transports the secondary oocyte from the ovary to the uterus, and the _____ transports the sperm from the epididymis to the common ejaculatory duct.
- A vasectomy does not affect the secondary sexual characteristics because the testes continue to produce the hormone _____.
- Females taking the contraceptive pill rarely ovulate because the pill contains the hormones _____ and _____.
- Menstruation typically comprise days _____ through _____ of the uterine cycle.
- Following ovulation, the remaining follicle cells become the _____.

7. Orgasm in the male is marked by _____, which does not occur in the female.
8. The vagina functions as a _____ and the _____ organ of females
9. The external genitalia of the female are collectively called the _____.
10. Using the lines provided below the diagram, identify the structure and give the function for those parts.



Name	Function
a. _____	_____
b. _____	_____
c. _____	_____
d. _____	_____
e. _____	_____
f. _____	_____
g. _____	_____
h. _____	_____
i. _____	_____

11. Trace the path of sperm in the male before ejaculation. _____

12. Which part of the pathway listed in the above question is also used for the passage of urine? _____

13. Which of the structures shown in question 10 contribute to the seminal fluid?

- a. _____
- b. _____
- c. _____

14. Role of hormones. Fill in the blanks.

- a. ant. pit. → _____ → seminiferous tubules → _____
 b. ant. pit. → _____ → interstitial cells → _____

15. Explain the difference between erection and ejaculation in males. _____

16. Explain the difference between impotency and sterility in males. _____

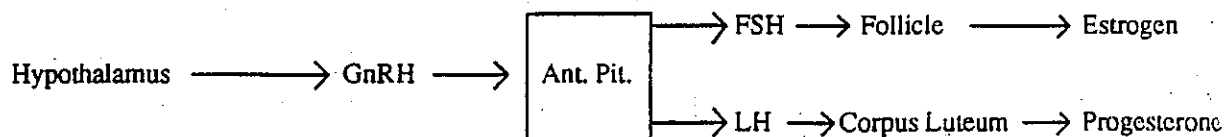
17. Name 6 functions of testosterone.

- a. _____ b. _____
 c. _____ d. _____
 e. _____ f. _____

18. Ovarian and uterine cycles (simplified). Fill in the table to indicate the events in these two cycles, assuming a 28-day menstrual cycle.

Ant. Pit.	Ovarian Cycle		Uterine Cycle	
	Phases	Events	Phases	Events
FSH	follicular days 1 - 13	a.	b. days 1 - 5	c.
			d. days 6 - 13	e.
	ovulation day 14			
LH	luteal days 15 - 28	f.	g. days 15 - 28	h.

19. Feedback control (simplified).



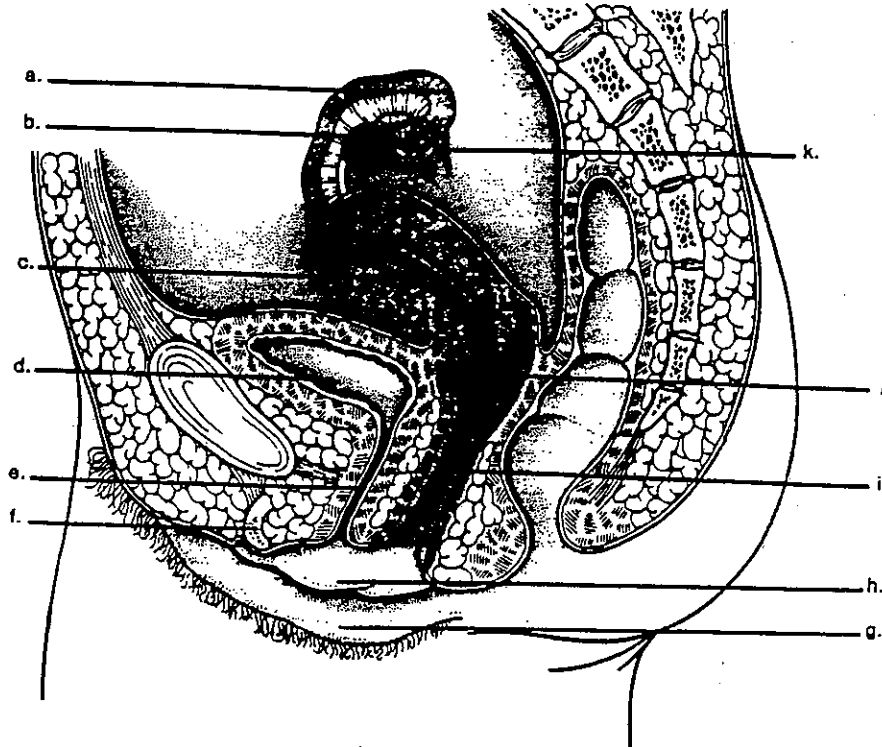
a. Add dotted lines to this diagram wherever feedback control is expected, and explain the diagram. _____

b. What 2 hormones in the diagram are gonadotropic hormones? _____ and _____

c. What 2 hormones are the female sex hormones? _____ and _____

20. On the basis of the above question, explain how the birth control pill functions. _____

21. Using the blanks provided below the picture, identify and state a function for the parts of the human female reproductive and urinary structures as shown.



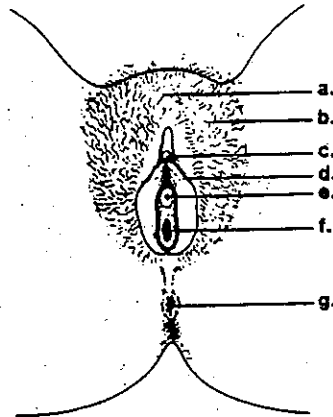
Name	Function
a. _____	_____
b. _____	_____
c. _____	_____
d. _____	_____
e. _____	_____
f. _____	_____
g. _____	_____
h. _____	_____
i. _____	_____
j. _____	_____
k. _____	_____

22. List 6 functions for estrogen and progesterone.

- | | |
|----------|----------|
| a. _____ | b. _____ |
| c. _____ | d. _____ |
| e. _____ | f. _____ |

23. How does the female orgasm differ from the male orgasm? _____

24. Label this diagram of the vulva.



25. Below are 2 groups of birth control measures. Rank the members of each group from most (1) to least (4) effective.

Group I

- a. _____ coitus interruptus
- b. _____ spermicidal jelly or cream alone
- c. _____ condom + jelly
- d. _____ natural family planning

Group II

- e. _____ vasectomy
- f. _____ rhythm method
- g. _____ diaphragm
- h. _____ IUD

26. Pregnancy.

- a. When is a woman actually pregnant? _____

- b. After pregnancy has occurred, why does ovulation not occur for nine months? _____

- c. What is the basis for pregnancy tests? _____

Sexually transmitted diseases.

27. AIDS. a. What name has been given to the organism that causes AIDS? _____
- b. Once the AIDS virus enters the bloodstream, it _____
- c. Describe the symptoms of the following: (1) early infection _____
 (2) ARC _____ (3) AIDS _____

28. Herpes. a. What organism causes genital herpes? _____
- b. What are the symptoms of genital herpes? _____

- c. Where is the virus between attacks? _____

29. Gonorrhea. a. What bacterium causes gonorrhea? _____

b. Mark all statements true (T) or false (F). Rewrite false statements to make them true statements.

_____ 1. A female is more likely than a male to seek medical help because of the presence of a discharge.

_____ 2. Males are subject to PID (pelvic inflammatory disease).

_____ 3. Gonorrhea never affects any part of the body except the reproductive tract.

30. Chlamydia. a. Chlamydia are the most common cause of _____

b. Name 3 ways in which chlamydia is like gonorrhea: (1) _____

(2) _____ (3) _____

31. Syphilis. a. What is the cause of syphilis? _____

b. Describe the 3 stages of syphilis: (1) _____

(2) _____ (3) _____

32. Genital warts. a. What is the cause of genital warts? _____

b. Researchers believe that these viruses are involved in 90 - 95% of all cases of cancer of the _____

33. _____ is the sperm-containing secretion of males that contains seminal fluid plus sperm.

34. _____ is the contraceptive method of withdrawing the penis from the vagina before ejaculation.

True (T) or False (F) Questions. If you believe the statement to be false, then rewrite the statement as a true one.

35. In fertile, sexually mature males, the urethra sometimes carries sperm and sometimes carries urine.

Answer: _____ Restatement: _____

36. There is no direct connection between the urinary and the reproductive systems in adult females.

Answer: _____ Restatement: _____

37. Cowper's glands are endocrine glands.

Answer: _____ Restatement: _____

38. Fertilization occurs usually in the oviduct.

Answer: _____ Restatement: _____

39. The outer membrane of a newly implanted embryo produces a hormone called LH that maintains the corpus luteum

Answer: _____ Restatement: _____

40. The secondary male characteristics are directly maintained by FSH and LH (ICSH).

Answer: _____ Restatement: _____

41. The testes lie outside the abdominal cavity because the vas deferens is very long.

Answer: _____ Restatement: _____

42. AIDS is the most prevalent sexually transmitted disease today.

Answer: _____ Restatement: _____

43. The sexually transmitted diseases caused by bacteria are more easily treated than those caused by viruses.

Answer: _____ Restatement: _____

Multiple Choice Questions

44. What do FSH, LH, testosterone, progesterone, and estrogen have in common?

- a. They occur only in the female.
- b. They occur only in the male.
- c. All of them directly affect the uterine lining.
- d. All of them are necessary to sexual reproduction.

45. The vas deferens

- a. becomes erect.
- b. carries sperm.
- c. is surrounded by the prostate gland.
- d. transports the egg to the uterus.

46. The uterus

- a. is connected to both the oviducts and the vagina.
- b. is not an endocrine gland.
- c. contributes to the development of the placenta.
- d. All of the above are true.

47. The prostate gland

- a. is removed when a vasectomy is performed.
- b. is not needed to maintain the secondary sex characteristics.
- c. receives urine from the bladder.
- d. All of the above are true.

48. Ovulation occurs

- a. as a result of an LH surge.
- b. only on day 14 of the menstrual cycle.
- c. in postmenopausal women.
- d. as a result of testosterone.
- e. Answers *a* and *b* above are true.

49. Pregnancy begins

- a. when an egg is fertilized.
- b. when ovulation occurs.
- c. upon successful implantation.
- d. during the follicular phase.

50. Sertoli cells are found in the _____

- a. seminal vesicles
- b. prostate gland
- c. Cowper's gland
- d. testes
- e. ovary

51. In the human male, hormones from the _____ stimulate production of testosterone by secreting _____

- a. testis; seminal fluid
- b. hypothalamus; trophic hormones
- c. pituitary gland; LH
- d. seminal vesicles; FSH
- e. prostate gland; releasing hormones

52. The hormone FSH stimulates the

- a. release of the egg from the follicle.
- b. development of a follicle.
- c. development of the endometrium.
- d. beginning of the menstrual flow.
- e. Both *a* and *c* are true.

53. Menstruation begins in response to
- an increase in blood estrogen levels.
 - a decrease in blood progesterone levels.
 - rupture of the ovarian follicle.
 - changes in the blood's CO_2 level.
 - secretion of FSH by the pituitary.
54. Secretions from which of the following structures are required before implantation can occur?
- the ovarian follicle
 - the pituitary gland
 - the corpus luteum
 - Both *a* and *b*.
 - All of the above are correct.

IV. Subjective Chapter Test

55. Discuss how the structure and the function of the sperm are interrelated.
56. Discuss various factors that may result in infertility.