I. MULTIPLE CHOICE: There is only one answer per question.

1. Of the following statements which one is correct regarding estradiol in males?
   A. No estradiol is produced in males.
   B. Estradiol is produced by the cells of Leydig.
   C. Estradiol is produced by Sertoli cells.
   D. Testosterone is converted to estradiol within target cells.
   E. Estradiol binds to DHT receptors.

2. Of the following statements which one is correct regarding a hormone that works through a second messenger system?
   A. The hormone binding to a membrane receptor activates a G-protein.
   B. The hormone must be a steroid.
   C. The hormone-receptor complex binds to a chromosome.
   D. The hormone can only bind to a receptor if it is complexed with a carrier molecule.
   E. More than one of the above is correct.

3. The effect a hormone has is dependent upon several factors, including
   A. the affinity of the receptors of the target cell.
   B. the size of the target cell.
   C. the distance between the target cell and the endocrine gland that produces the hormone.
   D. whether the hormone is released into the venous or arterial circulation.
   E. none of the above.

4. In males puberty begins when the hypothalamus becomes
   A. less sensitive to GnRH.
   B. less sensitive to testosterone.
   C. more sensitive to estrogen.
   D. more sensitive to growth hormone.
   E. less sensitive to LH.

5. Secretions from the adrenal cortex are regulated by ACTH. ACTH is produced by the
   A. adrenal cortex.  
   B. adrenal medulla.  
   C. hypothalamus.
6. Of the following statements which one is correct regarding female reproduction.

   A. The oviducts are derived from the Wolffian ducts.
   B. Fertilization usually occurs in the uterus.
   C. Puberty starts later in human females than in human males.
   D. At birth a human female has all the germ cells she will ever have.

7. Oxytocin is **produced** in the

   A. infundibulum.     B. supra optic nucleus.     C. adenohypophysis.
   D. neurohypophysis.  E. Gonads.

8. Great advancements were made in the study of the effects of hormones when it was possible to synthesize them. The synthesis of hormones first occurred in

   A. ancient china.    B. the 1600's.        C. the late 1800's.
   D. the 1940's.      E. the 1970's.

9. Of the following which one is an example of up-regulation?

   A. Rising FSH levels increase estradiol which leads to another increase in FSH.
   B. An increase of progesterone receptors following an increase in estradiol.
   C. The lowering of blood sugar following secretion of insulin.
   D. Oxytocin binding to a receptor and stimulating the production of cAMP.
   E. The conversion of testosterone to estradiol.

10. During development the Wolffian Ducts degenerate if

    A. testosterone is absent.
    B. germs cells develop in medulla of the primordial gonad.
    C. the ovary produces estradiol.
    D. Wolffian Inhibiting Factor is produced.
    E. none of the above, as the Wolffian Duct differentiates into the ureters in males and females.

11. Which of the following is/are an activational effect of testosterone?

    A. Maintenance of the spinal nucleus of the bulbocavernosus during development.
    B. Stimulation of the development of the Wolffian Duct.
    C. Stimulating the growth of the penis during puberty.
    D. Triggering hyperplasia in the mature prostate.
    E. more than one of the above.

12. Under which of the following conditions would testosterone be functioning as a tropic hormone?
A. High levels of testosterone suppress the release of Growth Hormone-Releasing Hormone.
B. Testosterone increases muscle mass in males during puberty.
C. Testosterone is responsible for the increase in girth of the penis.
D. After menopause testosterone stimulates increased hair production in human females.
E. more than one of the above is correct.

13. This structure has a narrow passage normally filled with a thick viscous mucus. Name it.
A. uterus       B. epididymis      C. vagina
D. cervix      E. oviduct

14. Which of the following has increased in the last 50 years?
A. sperm density/ml  B. semen volume  C. the age of menarche
D. cryptorchidism  E. More than one of the above

15. ________ is responsible for the enlargement of the human penis during an erection.
A. Erectile tissue  B. A baculum  C. Blood  D. Estrogen

16. Which of the following represents the correct order in the body's production of testosterone.
A. cholesterol > progestin > testosterone
B. cholesterol > progestin > estradiol > testosterone
C. progestin > cholesterol > testosterone
D. cholesterol > progestin > DHT > testosterone
E. cholesterol > estradiol > testosterone

17. Of the following compounds which one is known to act as a second messenger?
A. estrogen  B. Ca++  C. cAMP
D. FSH  E. More than one of the above

18. Of the following structures which one(s) is/are derived from the Mullerian ducts.
A. epididymis  B. urethra  C. cervix
D. penile shaft  E. none of the above

19. Mullerian Inhibiting factor is produced by
A. Sertoli cells.  B. the corpus luteum.  C. primary follicles.
D. the cells of Leydig.  E. paraventricular nucleus.

20. The labia minora are homologous to the
A. penial shaft  B. scrotum  C. genital tubercle
D. glans penis  E. none of the above
21. The enzyme 5-α-reductase is responsible for the conversion of ______________ to _____________.

A. progesterone/testosterone  
B. estradiol/DHT  
C. testosterone/estradiol  
D. testosterone/DHT  
E. progesterone/estradiol

22. Based upon the classic definition of a hormone, a hormone **must**

A. be produce by a tissue derived from ectoderm.  
B. consist of or be produced from amino acids.  
C. affect a target cell within the same tissue that produced it.  
D. be secreted from an endocrine gland.  
E. work through a second messenger system.

23. Of the following changes associated with puberty which one is **only** associated with **male** puberty?

A. Genital hair.  
B. A change in the relative center of gravity.  
C. Thickening of the vocal cords.  
D. Enlargement of the external genitalia.  
E. Increased steroid production.

24. Stem cells (future germ cells) that migrate from the yolk sac to the gonadal cortex are produced from

A. ectoderm.  
B. endoderm.  
C. mesoderm.  
D. neuroderm.

25. By definition puberty ends when

A. high levels of LH inhibits the production of growth hormone.  
B. sex steroids reach normal adult levels.  
C. low levels of GnRH inhibit the release of growth hormone.  
D. the end plate of the long bones close.  
E. a person is able to produce functional gametes.

26. Exposure of a normal XX mammalian fetus to testosterone during development

A. would result in a normal fully functional male.  
B. would result in an infertile male.  
C. would produce a male with a female patterned brain.
D. would produce a masculinized female.
E. would have no effect on the fetus as this fetus would normally be exposed to testosterone.

27. In the ovary, germ cells are found in the
   D. perimetrium. E. ovarian medulla.

28. This molecule represents

STRUCTURAL DIAGRAMS OF STEROIDS WOULD APPEAR HERE

A. cholesterol. B. a progestin. C. testosterone.
D. DHT. E. an estrogen.

II. Short Answer-

29. Name the embryonic structure which becomes both part of the male reproductive and urinary/excretory system.

30. Name an endocrine gland other than the gonads that is known to produce androgens.

31. Hormones travel from the hypothalamus to the anterior pituitary via the ______________.

32. Name the layer of the uterus that is sensitive to progesterone.

33. Testosterone affects a number of tissues including the seminiferous tubules. When affecting the seminiferous tubules testosterone has a ________ function.

II. Short Answer- continued

34. Name the structure that is cut during a vasectomy.
35. Whether causing mitosis or the secretion of a compound from a cell all hormones effect the __________ of a cell.

36. In males, stem cells migrate from the yolk sac and begin to develop into germ cells in the ______ of the embryonic gonad.

37. Name the portion of the male reproductive system that adds fibrinolytic enzymes to semen.

38. Give one female primary sexual characteristic.

III. Matching-Put only one answer per question. **An answer may be used more than once.**

A. Match the hormone with the correct structure, function or characteristic.

A. growth hormone  F. LH  
B. melatonin  G. prolactin  
C. FSH  H. vasopressin  
D. estrogen  
E. GnRH

39. ______ Binds to receptors within the target cell nucleus.

40. ______ Produced by the pineal gland.

41. ______ During puberty this hormone stimulates the initial production of sperm.

42. ______ Stimulates growth of the labia majora during puberty.

43. ______ This hormone is released into the hypophyseal portal system.
B. Determine if the following are characteristic of male, female or both. Assume that except for the thing asked about the individual is normal.

A. Male  B. Female  C. Both male and female

44. _____ An xxy fruit fly.

45. _____ Produces oxytocin.

46. _____ During fetal development cells in the external genitalia are androgen sensitive.

C. Match the structure with the proper event or function.

A. vagina  E. ovary  
B. uterus  F. ampulla  
C. epididymis  G. cervix  
D. vas efferens  H. oviducts

47. _____ Site of gamete production.

48. _____ Produces and secretes a 21-carbon steroid.

49. _____ Acidic pH.

50. _____ Releases sperm during an ejaculation.