IB 140 Midterm #2 March 23rd, 2007

Student Name_____Student ID Number_____

1. Which answer is false about X chromosomes?
   a. A Barr body is formed when one X chromosome in female diploid cell shuts down
   b. only contain genes essential to sex determination
   c. one of the largest human chromosomes
   d. presence of Barr bodies is used to determine the sex of fetuses during amniocentesis

2. Which answer is correct about the Y chromosome?
   a. one of the largest human chromosomes
   b. genes on Y chromosome are essential for follicular development
   c. if sex-determining region of the Y (SRY) gene is present the embryo becomes female
   d. sex-determining region of the Y (SRY) gene encodes for testes determining factor

3. Genital ridges in the abdominal cavity of developing human embryos form into indifferent gonads at which time in gestation?
   a. 3 weeks
   b. 5 weeks
   c. 7 weeks
   d. 9 weeks

4. Which of the following is not true about gonad development?
   a. If Y chromosome is not present, primordial germ cells develop into oogonia within cortical cords of the gonad and the medulla degenerates
   b. If Y chromosome is present, gonadal cells proceed with testes development starting in the 9th week of gestation
   c. Before gonads differentiate into male or female, embryos of each sex possess both wolffian and mullerian ducts
   d. genes in X chromosome (e.g., DAX1) are actively involved in ovarian development

5. Which statement is false about the development of male accessory ducts and glands?
   a. in the embryo, testosterone stimulates the wolffian (mesonephric) duct system to develop into epididymus, vas deferens, seminal vesicles, & ejaculatory duct
   b. In the embryo, testosterone stimulates part of the urethra to develop into the prostate gland and the bulbourethral glands
   c. In the embryo, the vasa efferentia develop from mesonephric tubules
   d. Sertoli cells in embryonic testes secrete mullerian-inhibiting substance (MIS) which causes regression of mullerian ducts

6. Which statement is true about the development of female accessory ducts and glands?
   a. The upper 2/3rds of the vagina develops from the urogenital sinus
   b. The greater and lesser vestibular glands are derived from mullerian ducts
   c. The cervix, uterus, and oviducts develop from mullerian ducts
   d. The presence of mullerian inhibiting substance results in the development of the mullerian ducts

7. Which would result in the development of both mullerian and wolffian duct systems?
   a. Intact male rat embryo treated with an anti-androgen
   b. Orchidectomized (castrated) male rat embryo is given MIS and testosterone
   c. Orchidectomized (castrated) male rat embryo is given MIS
   d. Orchidectomized (castrated) male rat embryo is given testosterone

8. Which is false about the development of external genitalia?
   a. genital tubercle develops into clitoris or part of penis
   b. urogenital folds develop into ventral aspect of penis shaft
   c. labioscrotal swelling develops into labia minora or the scrotum
   d. urethral tissue develops into female lesser and greater vestibular glands

9. Which is true about the newborn reproductive system?
   a. Very few Leydig cells are present in the testes at birth
   b. Testes contain seminiferous tubles with spermatogonia, Sertoli cells, and sperm
   c. Each ovary in females contains 3 million oocytes in follicles
   d. Pair of testes usually have not descended into the scrotum by birth

10. Which is true about intersex people?
    a. 46:XY: aberrant recombinations result in Y chromosomes that have lost SRY, resulting in XY "females"
    b. typically the testicular tissue is normal and the ovarian tissue is dysgenetic
    c. 46:XY is the most common karyotype
    d. There are documented cases of successful self-fertilization in intersex individuals

11. Which of the following statements is true about abnormalities of ploidy number?
    a. polyploidy is more common than aneuploidy
    b. aneuploids have more or less than two full sets of homologous chromosomes
    c. Down's Syndrome (Trisomy 21) infants are never born to women less than 25 years old
    d. Down's Syndrome (Trisomy 21) is an example of an aneuploidy with an extra autosomal chromosome

12. What is the most common chromosomal abnormality in human embryos?
    a. Turner's Syndrome 45:XO
    b. Klinesfelter's 47:XXY
    c. Supermales 47:XYY
    d. Down's Syndrome 47:trisomy 21

13. What is false about testicular feminization syndrome?
    a. An example of 46:XY pseudointersex
    b. Have estrogen insensitivity disorder
    c. Because of the presence of MIS, no mullerian duct derivatives are present
    d. Develop female-like external genitalia

14. What is false about XY people who have 5α reductase deficiency?
    a. Newborns have abnormal sex accessory ducts and seminal vesicles
    b. Lack enzyme that converts testosterone to dihydrotestosterone (DHT)
    c. Newborns have external genitalia that appear to be female
    d. At puberty, testes descend into the labia majora and they fuse to become a scrotum

15. Which answer best describes how females differ from males in pubertal development?
    a. females on average begin their growth spurt one year earlier and become fertile one year earlier than males
    b. females on average begin their growth spurt two years earlier and become fertile two years earlier than males
    c. females on average begin their growth spurt one year earlier and become fertile two years earlier than males
    d. females on average begin their growth spurt two years earlier and become fertile one year earlier than males

16. Which is the correct chronological order of pubertal changes in females?
    a. accelerated skeletal growth rate, pubic hair, axillary hair, acne
    b. pubic hair, axillary hair, accelerated skeletal growth rate, acne
    c. accelerated skeletal growth rate, pubic hair, acne, axillary hair
    d. pubic hair, accelerated skeletal growth rate, axillary hair, acne

17. Which is false about USA female pubertal changes?
    a. The average age for menarche is 12.3 years
    b. The first ovulation always occurs at the time of menarche (first menstruation)
    c. The average age that females reach their "adult' height is 15 years
    d. Precocious puberty in females is when there is breast development or pubic hair development before age 7 years

18. What is the average age that USA males demonstrate initial stage of spermatogenesis?
    a. 7 years
    b. 8 years
    c. 9 years
    d. 11 years

19. Which is the correct chronological order of pubertal changes in males?
    a. accelerated skeletal growth rate, pubic hair, testes enlargement, axillary hair
    b. testes enlargement, pubic hair, accelerated skeletal growth rate, axillary hair
    c. accelerated skeletal growth rate, pubic hair, axillary hair, testes enlargement
    d. testes enlargement, accelerated skeletal growth rate, pubic hair, axillary hair

20. Which is true about testicular development?
    a. While there are only a small number of Leydig cells present at birth, by 6 months of age there is an abundance of Leydig cells
    b. The testicular size of an 8 year old is 0.8 ml while an adult is 16.5 ml
    c. Mature spermatozoa are typically produced by 10 year old males
    d. Cryptochordism prevents spermatogenesis and causes significant loss of Sertoli and Leydig cells

21. Which are the levels of FSH and LH from gestation to puberty?
    a. high in fetus, low in neonate, low 1-8 years, high in puberty
    b. low in fetus, low in neonate, low 1-8 years, high in puberty
    c. low in fetus, high in neonate, low 1-8 years, high in puberty
    d. high in fetus, high in neonate, low 1-8 years, high in puberty

22. Which is not an effect of androgens in pubertal females?
    a. slight lowering of voice
    b. acne development
    c. breast development
    d. long bone growth

23. Which is false about pubertal onset?
    a. melatonin levels rise significantly before the onset of puberty
    b. only females have the ability for positive feedback of estrogen on GnRH
    c. kisspeptin is believed to stimulate the release of GnRH and contribute to the onset of puberty
    d. Leptin levels increase before the onset of puberty

24. Which is false about menarche?
    a. females with low body fat can have delayed menarche
    b. obese females can have delayed menarche
    c. increased exposure to xenoestrogens from the environment may contribute to the earlier development of menarche
    d. the age of menarche in USA females has shown a steady decline over the past 100 years

25. Which is correct about genetics and menarche?
    a. A higher ratio of testosterone/estrogen results in an earlier initiation of sexual development in females
    b. A variant of the gene CYP3A4 influences an enzyme that breaks down estrogen
    c. The gene CYP3A4 is in greater frequencies in Black and Latina females compared to white females
    d. White females tend to reach puberty earlier than Black and Latina females

26. Which is true for andropause?
    a. All the male sex accessory structures and glands reduce in size
    b. facial hair growth increases
    c. voice may lower in pitch
    d. blood levels of estrogen may rise in older men

27. Which is false about androgen replacement therapy for andropause?
    a. may increases libido
    b. may decrease risk of prostate cancer
    c. may increase muscle mass
    d. may increase bone density

28. Which of the following is false for menopause?
    a. women with smaller number of total ovulations through a lifetime tend to enter menopause earlier
    b. associated with loss of ovarian follicular activity
    c. associated with dramatic drop in ovarian hormones
    d. women who smoke cigarettes tend to enter menopause early

29. Which of the following are not associated with late menopause?
    a. women with shorter follicular phases in the menstrual cycle
    b. women who breast feed their infants
    c. use of oral contraceptives
    d. females with late menarche

30. Regular menstrual cycles and elevated FSH represents which reproductive stage?
    a. early reproductive
    b. late reproductive
    c. early menopausal transition
    d. early menopause

31. The main reason for infertility in women under 40 years of age?
    a. failure to ovulate
    b. failure to conceive
    c. inability of uterus to implant egg
    d. loss of preembryos or embryos with chromosomal abnormalities

32. Which of the following endocrine changes is false about perimenopause/menopause?
    a. drop in circulating estrogen contributes
    b. increase in release of inhibin
    c. decrease on ovaries response to FSH and LH
    d. increased levels of FSH

33. Which is not a risk factor for osteoporosis?
    a. amenorrhea
    b. nulliparous
    c. smoking
    d. obesity

34. Which is not true of estrogen hormone replacement therapy for menopause?
    a. relieves hot flashes
    b. reduces vaginal dryness
    c. reduces breast cancer
    d. reduces osteoporosis

35. Which is true about phytoestrogens?
    a. plant molecules that have a strong agonist effect on breast estrogen receptors
    b. studies have demonstrated that regular consumption of phytoestrogen-rich foods may increase the follicular phase of the menstrual cycle in women
    c. genistein is a phytoestrogen derived from flaxseed (*Linum usitatissimum)*
    d. People in the USA have 50-80 fold higher concentrations of phytoestrogens compared to people in Japan

36. What is false about the regular consumption of tea from *Camellia sinensis?*
    a. lower rates of osteoporosis
    b. reduces the risk of cardiovascular disease
    c. flavonoids in tea are strong oxidants
    d. caffeine is not the molecule that produces health benefits for the heart and bones

37. Which is not true about pheromones?
    a. Human female body odors released during the follicular phase are less pleasant to males than those released during the luteal phase
    b. Human females are able to detect musk-like fragrances near the time of ovulation, but not during other times of their menstrual cycles
    c. Both human females and Rhesus monkeys secrete copulin molecules that appear to increase males' sexual attraction to them
    d. Pheromones appear to be responsible for triggering synchronized menstrual cycles in women who live together

38. Which is true about Vomeronasal organs (VNO)?
    a. located within the olfactory epithelium on the upper part of the nasal cavity
    b. Skin extracts containing androstenes (androgens) cause the female VNO to respond less than the male VNO
    c. Human adults VNO cells have nerve sensory cells and tracts leading directly to the gonads
    d. Skin extracts containing estrenes (estrogens) cause the male VNO to respond more than the female VNO

39. Which is true about Major Histocompatibility Complex genes (MHCs)?
    a. the vomeronasal region is known to be the area in humans for MHC detection
    b. human mates with similar MHCs tend to be less fertile with higher miscarriage rates
    c. Women are attracted to scents of men who are most like them themselves in major histocompatibility complex genes (MHCs)
    d. The more similar human pairs MHCs, the better their offspring immune systems will be at detecting foreign proteins, e.g., viruses or toxins

40. What is the first change that takes place in the excitement phase of the female sexual response cycle?
    a. uterine contractions or fibrillations
    b. clitoris shaft increases in diameter
    c. nipples become erect and size of breast increase by 25%
    d. vaginal lubrication

41. What is not true about the orgasmic phase of the female sexual response cycle?
    a. There can be either clitoral orgasm or vaginal orgasm
    b. Women who reach the plateau phase do not always proceed to an orgasm
    c. Studies have shown that a higher percentage of women can achieve an orgasm during vaginal coitus than during masturbation
    d. Status orgasmus in a woman is a sustained orgasm lasting up to one minute

42. What is true about the excitement phase of the male sexual response cycle?
    a. Sympathetic nerves in the erection center dominate and cause dilation of arterioles which results in vasocongestion of the corpora cavernosa and the corpus spongiosum
    b. Parasympathetic nervous system constricts arterioles which inhibits penile erection
    c. Testes become elevated because of contraction of cremaster muscle in scrotum
    d. The only way a male can achieve an erection is through erotic tactile stimulation

43. Which is not true about the plateau phase of the male sexual response cycle?
    a. urethral bulb enlarges to three times its usual size
    b. preorgasmic emission fluid from the bulbourethral glands does not contain sperm
    c. prostate gland enlarges
    d. testes volume increases by 50%

44. Which is not true about the orgasmic phase of the male sexual response cycle?
    a. During emission phase of ejaculation, smooth muscles contract from the testes all the way to the urethra to transport semen into the urethral bulb
    b. Muscle sphincter relaxes which allows urine to enter the urethra from the bladder
    c. Rhythmic contraction of the penis and the bulbocavernosus muscle result in a forceful expulsion of the semen from the urethra
    d. Male may experience clutching motions of hands and feet

45. Which is the region of the brain that most influences sexual behavior?
    a. occipetal lobe
    b. cerebellum
    c. brainstem
    d. limbic system

46. Which is not true about hormones and sexual behavior?
    a. In mammals, testosterone is actually converted to estradiol by cells in part of the limbic system, and it is actually is estrogen that directly increases male sex drive
    b. In normal men, there is an inverse relationship between blood levels of testosterone and how long it takes to achieve maximal penile erection
    c. Progesterone at high levels typically increases female libido
    d. Oxytocin is released during the sexual response in both females and males

47. Which of the following is not associated with a gay sexual preference?
    a. males with multiple older brothers
    b. left handed
    c. having an identical twin who is gay
    d. 2nd finger shorter than the fourth finger

48. What is not true about sexual dysfunction?
    a. the majority of cases have a physical cause
    b. vaginismus is painful, spasmodic contractions of outer one third of vagina
    c. dyspareunia can be caused by failure of vagina to lubricate
    d. penile glans can develop a hypersensitivity to spermicides

49. What is true about erectile dysfunction (ED) in men?
    a. associated with high prolactin levels
    b. Psychological conditions such as anxiety or fear activate the sympathetic system which inhibits erection
    c. when a man with ED reports having morning erections, the cause the erectile dysfunction is likely to be biological and not psychological
    d. Viagra (sildenafil) is a popular treatment of erectile dysfunction with a mechanism of action that constricts penile veins

50. What is a mechanism of action of yohimbine from *Pausinystalia johimbe* from West Africa?
    a. stimulates testosterone production
    b. stimulates estradiol production
    c. increases sensation of penis glans
    d. competitive blockade on adrenergic α receptors