

NAME \_\_\_\_\_

**FINAL  
MCB 135E  
Fall 1994**

**MULTIPLE CHOICE** (CIRCLE correct answer) - 3 points each

1. Upon ovulation, the egg leaves the follicle to enter the:
  - A. ovary
  - B. abdominal cavity
  - C. oviduct
  - D. uterus
  - E. vagina
2. After ovulation, the optimum time for fertilization lasts:
  - A. less than 1 hour
  - B. 5-10 hours
  - C. 24-48 hours
  - D. 72-120 hours
  - E. more than 120 hours
3. The placenta:
  - A. delivers nutrients to the embryo
  - B. exchanges gases between maternal and fetal blood
  - C. removes waste products of metabolism from the embryo
  - D. secretes hormones
  - E. all of the above
4. The egg in the follicle is immediately surrounded (and protected) by the:
  - A. corona radiata
  - B. zona pellucida
  - C. lymphocytes
  - D. mucus-secreting cells
  - E. both A and B
5. Implantation of the fertilized egg on the uterine wall is made possible by:
  - A. proliferation of the uterine mucosa due to estrogens
  - B. hyperhemia of the uterine mucosa due to progesterone
  - C. decreased motility of uterine muscles due to progesterone
  - D. continuing hormonal secretory activity of the corpus luteum
  - E. all of the above

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6. Human chorionic somatomammotropin (or placental lactogen) is involved in all of the following functions except one. Circle this exception.
- A. stimulates breast development
  - B. promotes production of estrogen
  - C. affects glucose and fat metabolism
  - D. allows the mother to draw on her fat stores while allowing glucose to be used by the fetus
  - E. affects the nutrition and metabolism of both mother and fetus
7. Thalidomide is a drug:
- A. with sleeping, sedative and tranquilizer actions
  - B. taken by pregnant women in the first trimester of pregnancy to overcome "morning sickness"
  - C. with teratogenic actions on the fetus
  - D. with toxicity for the embryo, particularly between the 3rd and 8th week of gestation
  - E. all of the above
8. Growth hormone:
- A. is secreted from the hypothalamus
  - B. its secretion is inhibited by somatostatin
  - C. its secretion is stimulated by cortisol
  - D. is a steroid hormone
  - E. none of the above
9. During pregnancy the level of which of the following hormones increases?
- A. GnRH
  - B. LH
  - C. FSH
  - D. progesterone
  - E. all of the above
10. "Small-for-date" newborns
- A. are born at term (37 weeks of pregnancy and over)
  - B. have low body weight (2,500 gms or less)
  - C. suffered impaired embryonal and fetal growth due to placental insufficiency or maternal/paternal disturbances
  - D. represent a group of newborns at risk for neonatal survival and/or optimal development at later ages
  - E. all of the above

11. Secretion of sex hormones may be controlled by:
  - A. other hormones
  - B. neural signals
  - C. stress
  - D. psychological and emotional conditions
  - E. all of the above
  
12. Full development and function of the male secondary organs at puberty and in the adult requires:
  - A. somatostatin
  - B. LH
  - C. oxytocin
  - D. FSH
  - E. androgens
  
13. Home-use kits for determining a woman's fertile period depend on the detection of one hormone in the urine. This hormone is:
  - A. FSH
  - B. estrogen
  - C. progesterone
  - D. GnRH
  - E. LH
  
14. Which of the following is not a male secondary sexual characteristic that occurs or undergoes changes at puberty?
  - A. a beard
  - B. an increased incidence of acne
  - C. a deep voice
  - D. increased fat in the buttocks
  - E. an enlarged penis
  
15. In human males, testosterone is produced mainly by the:
  - A. Leydig cells
  - B. Sertoli cells
  - C. seminiferous tubules
  - D. epididymis
  - E. vas deferens
  
16. Which of the following is not a cause of dwarfism?
  - A. hypothyroidism
  - B. hypopituitarism
  - C. malabsorption syndrome
  - D. increased IGF-I
  - E. exposure to high altitude

17. The evidence that the onset of puberty is under neural control is based on the:
- A. responsiveness of the immature gonads to LH and FSH
  - B. responsiveness of anterior pituitary to hypothalamic GnRH
  - C. the greater inhibitory feedback of sex hormones on the hypothalamic release of GnRH before puberty
  - D. the progressive decrease of this inhibitory feedback at puberty
  - E. all of the above
18. According to the evolutionary theory of the sexualization of the brain, the reproduction and non-reproductive sexual biases of an individual will usually be:
- A. complementary
  - B. antagonistic
  - C. unrelated
  - D. randomly determined by social and biological forces
19. The fetal heartbeat can be heard through the maternal womb by:
- A. four to five months of gestation
  - B. one month of gestation
  - C. two months before delivery
  - D. two months of gestation
  - E. none of the above
20. Studies show that at birth
- A. areas of the brain are already genderized
  - B. social expectations are strongly genderized
  - C. social expectations are determined by the genital sex of the individual
  - D. genital sex usually reflects chromosomal sex
  - E. all of these are true
21. The prenatal stress theory (also called the maternal stress theory) states that severe stress to the pregnant woman will increase her blood levels of \_\_\_\_\_ which crosses the placenta and can reduce \_\_\_\_\_ production by the male fetus.
- A. glucocorticoid; testosterone
  - B. androgen; gonadotropin
  - C. estrogen; testosterone
  - D. gonadotropin; testosterone

22. Thyroid hormones are necessary for:
- A. brain maturation
  - B. whole-body growth
  - C. stimulation of GH secretion from the anterior pituitary
  - D. efficient thermoregulation
  - E. all of the above
23. Menarche:
- A. represents the first menstrual period
  - B. coincides with the second peak of whole-body accelerated growth
  - C. depends on the maturation of the hypothalamo-pituitary-ovarian axis
  - D. is undergoing a "secular" trend
  - E. all of the above
24. At adolescence
- A. cardiac rate increases
  - B. cardiac stroke volume increases
  - C. cardiac volume decreases
  - D. blood pressure decreases
  - E. all of the above
25. Marasmus is:
- A. due to lack of food (including all necessary nutrients for growth).
  - B. food is available but the individual does not want to eat
  - C. food is ingested but cannot be absorbed or digested
  - D. due to excessive vomiting
  - E. all of the above

**TRUE/FALSE** (Circle one) - 2 points each

26. T/F Fetal hemoglobin carries more oxygen than adult hemoglobin.
27. T/F Because prolactin inhibits GnRH, breastfeeding is a reliable form of contraception.
28. T/F The administration of prostaglandins will result in labor and terminate pregnancy during almost any stage of gestation.
29. T/F Most antibodies are too large to diffuse across the placenta.

30. T/F In Turner syndrome the chromosomal make-up of the individual is XO; in Klinefelter syndrome it is XXY.
31. T/F True precocious puberty is due to an early but otherwise normal pattern of gonadal maturation.
32. T/F Myelination is essentially a postnatal event and progresses until the late twenties
33. T/F The loop of Henle is shorter in infants than in adults.
34. T/F ADH, secreted from the posterior pituitary, regulates the permeability to water of renal collecting ducts.
35. T/F Sudden infant death syndrome (SIDS) is due to a deficiency of alveolar surfactant.
36. T/F Anabolic steroids administered during adolescence delay puberty.
37. T/F The prostate is a male secondary sex organ.
38. T/F Of the two major thyroid hormone, the most biologically active is thyroxine.
39. T/F Precocious pseudopuberty indicates the early development of some secondary sexual characteristics without normal maturation of the gonads.
40. T/F The lack of 5-alpha reductase can impair the masculinization of the male genitalia.

41. (20 points). Systems, organs and body parts grow at different rates (allometric growth). On the graph below, I have drawn the curve for postnatal body weight growth. The abscissa indicates age and the ordinate the size obtained in percentage of final weight (taken as 100 %) reached at birth or at 20 years

Please, draw the respective curves for the postnatal growth of the:

thymus

heart

brain

uterus

42. (20 points). Briefly discuss the functional significance of the following associations and compare their efficiency in infants, children or adolescents and adults.

glomerular filtration/rate of water load excretion

urine concentration mechanisms/loop of Henle/urea

intestinal infections/diarrhea/dehydration

cardiac output/cardiac rate/stroke volume



43. (15 points) Rats can be genetically selected as maze-dull (learning to run a maze with many errors) and maze-bright (learning to run a maze with few errors). However if the rats are reared under enriched or restricted conditions, the number of errors will change, irrespective of the genetic make-up.

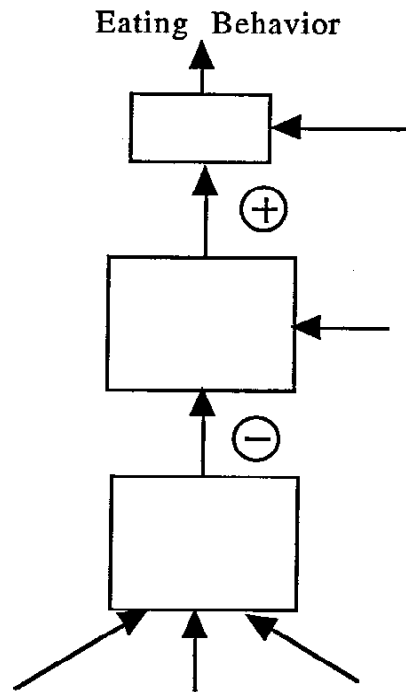
Indicate in the appropriate space with an arrow, whether you expect the number of errors to increase ( $\uparrow$ ), decrease ( $\downarrow$ ) or no change ( $\leftrightarrow$ ).

<u>Strain</u>	<u>Usual rearing</u>	<u>Enriched rearing</u>	<u>Restricted rearing</u>
Bright	117*		
Dull	164*		

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\*number of errors

Explain what are the implications of these results in relation to the respective roles of genetic and epigenetic factors in development.

44. (20 points) The regulation of eating is complex and involves several levels of integration. From the handouts in class please,
- (1) write in the following squares the correct names of brain centers involved in eating regulation, and
  - (2) write in also the inputs that influence these centers as indicated by the arrows,
  - (3) give a brief definition of anorexia and of bulimia



Anorexia

Bulimia

