1997 Endocrine Exam Questions

TTUHSC Physiology
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Directions: Each of the questions or incomplete statements below is followed by five suggested answers or completions. Select the *one* that is *best* in each case.

41. The following adjective is used to describe local communication between cells of different types, mediated by simple diffusion:

A. autocratic.
B. autocrine.
C. endocrine.
D. paracrine.
E. synaptic.

42. Insulin-sensitive tissues include

A. fat.
B. liver.
C. muscle.
D. all of the above.
E. none of the above.

43. Insulin secretion is stimulated by

A. amino acids.
B. C peptide.
C. epinephrine.
D. insulinase.
E. somatostatin.

44. The insulin receptor

A. acts as a ligand-responsive transcription factor.
B. has a single subunit.
C. has tyrosine kinase activity.
D. is an ion channel.
E. is coupled to adenylate cyclase.

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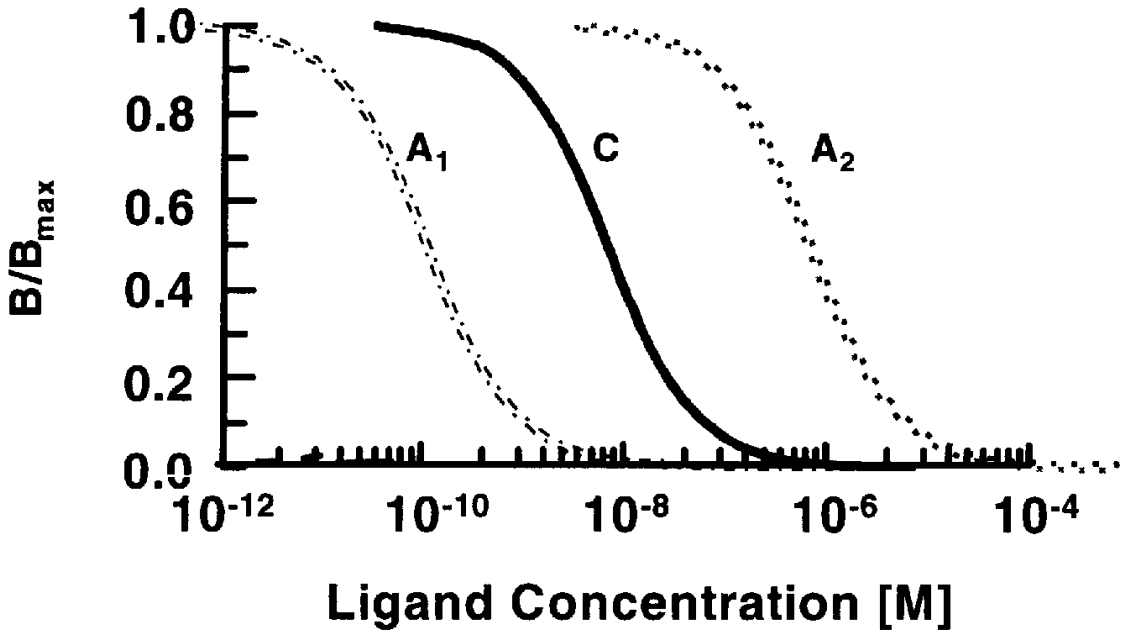

45. This graph depicts the results from a hypothetical displacement experiment using radiolabeled cortisol. "C" represents the addition of $_1$" and "A_2" refer to the addition of cortisol analogs. Which of the following statements is true?

A. Cortisol binds to the receptor with a $K_D = 10^{-6}$ M.
B. Cortisol binds to the receptor with a $K_D = 10^{-10}$ M.
C. The receptor has a greater affinity for A_1 than for cortisol.
D. The receptor has a greater affinity for A_2 than for cortisol.
E. A_1 binds with greater cooperativity than A_2.

46. Counter-regulatory hormones include all of the following **EXCEPT**:

A. cortisol.
B. epinephrine.
C. glucagon.
D. growth hormone.
E. somatostatin.

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47. Insulin

A. acts via generation of cAMP
B. causes a translocation of glucose transporters to the muscle sarcolemma.
C. secretion is stimulated by epinephrine.
D. stimulates muscle gluconeogenesis.
E. all of the above.

48. Glucagon

A. depresses protein synthesis in muscle.
B. is bound to glucagon-binding globulin (GBG) in the bloodstream.
C. produces C-peptide when degraded.
D. stimulates gluconeogenesis in the liver.
E. stimulates lipolysis in the fat cell.

49. The most rapid period of growth is

A. during fetal life.
B. immediately after birth.
C. during puberty.
D. during growth hormone treatment in the hypopituitary child.
E. during REM sleep.

50. Vials X and Y are known to contain either a solution of hormone or a saline placebo. Five days after injection, rats treated with X have a greater rate of thyroidal iodide uptake and a greater basal metabolic rate (BMR) than rats treated with Y. It is likely that

A. X contains thyroxine (T_4).
B. Y contains thyroxine.
C. X contains thryotropin (TSH).
D. Y contains thyrotropin.
E. X contains somatostatin.

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51. Respiratory quotient is used to calculate

A. basal metabolic rate (BMR).
B. body temperature.
C. heat production.
D. predictable exercise levels.
E. relative mix of fuels (fats and carbohydrates) utilized.

52. Carbohydrate stores

A. are found primarily in the pancreas.
B. are synthesized from glucose and fatty acids.
C. can provide about 2000 kcal.
D. can satisfy energy requirements for about two weeks.
E. exist primarily as circulating glucose.

53. Net 24-h fat synthesis from carbohydrates when consuming a typical American diet is

A. 1000 kcal.
B. 3500 kcal.
C. 25% of total caloric intake.
D. 25% less than total caloric intake.
E. zero.

54. The biologically active form of Vitamin D is

A. 1-hydroxy D_3
B. 25-hydroxy D_3
C. $1,24(OH)_2D_3$
D. $1,25(OH)_2D_3$
E. $24,25(OH)_2D_3$

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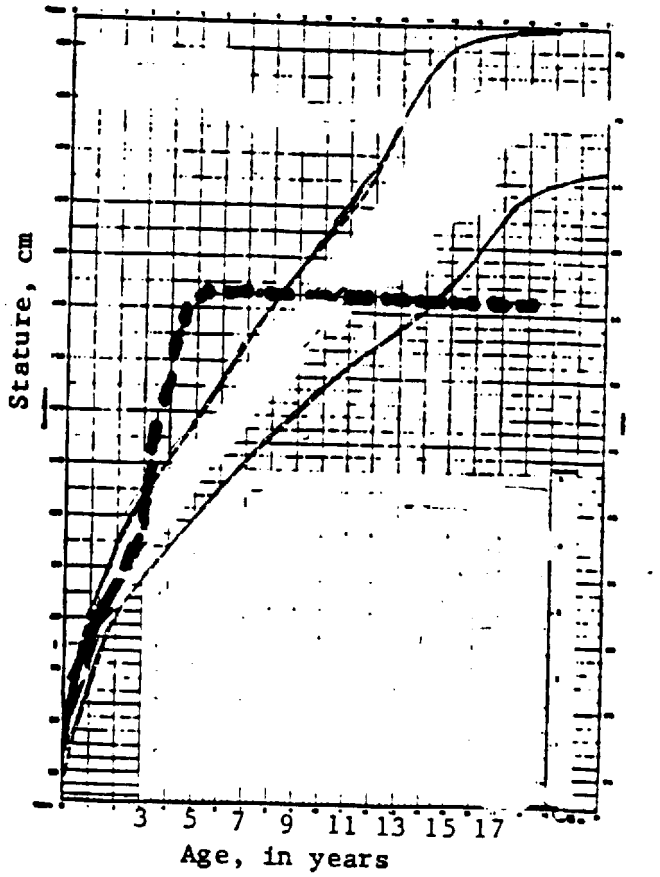

55. This figure is a copy of a standard pediatric growth chart where height is plotted as a function of age. The 5% and 95% confidence limits of a normal pediatric population are indicated by the solid lines. The abnormal growth of the depicted individual (illustrated by the dashed line) is likely to be caused by

A. hypothyroidism.
B. deficiency of somatomedin C receptors (e.g., pygmy).
C. growth hormone deficiency.
D. precocious puberty.
E. primary pituitary dwarfism.

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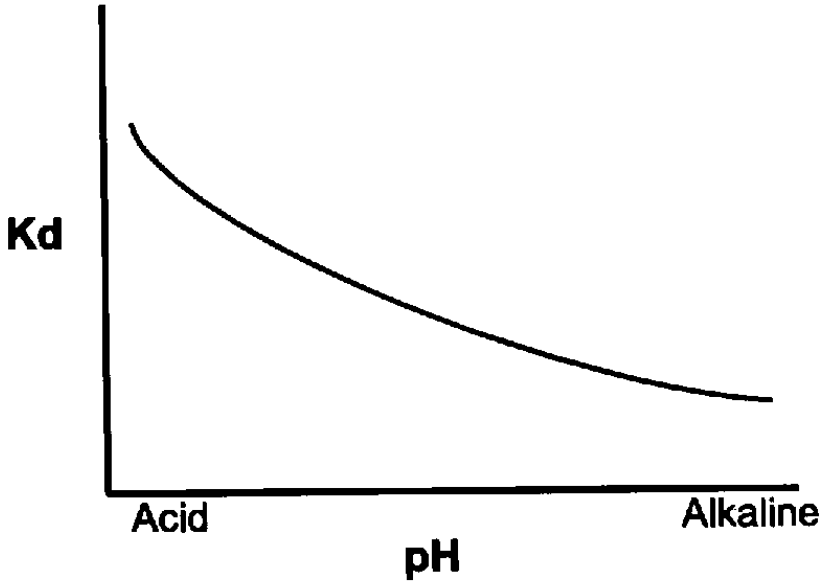
56. Increases in serum calcium result in

A. increases in serum PTH.
B. increases in serum calcitonin.
C. decreases in serum PTH.
D. decreases in serum calcitonin.
E. B and C.



57. The figure depicts the effect of pH on the dissociation constant (K_D) of calcium binding proteins. What would happen if blood pH were to decrease from 7.4 to 7.2?

A. Free serum calcium concentration would decrease.
B. Free serum calcium concentration would increase.
C. Free serum calcium would not change.
D. More calcium would bind to the proteins.
E. A and D.

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58. A 21-year-old woman has the following thyroid function test results:

Serum T_4	Elevated
Resin T_3 Uptake	Decreased
Serum TSH	Normal

What do you conclude about her endocrine status?

A. hyperthyroid
B. hypothyroid
C. normal
D. thyroid binding globulin (TBG) deficiency
E. TBG excess

59. Prolactin secretion

A. can be stimulated by conditioned reflexes such as the sound of a baby crying.
B. evokes the milk "let down" response.
C. is essential for lactation.
D. is inhibited by surgical section of the hypothalamus-pituitary portal system.
E. is not present in males.

60. In the normal menstrual cycle, the follicular phase is characterized by

A. a decreased frequency for the GnRH pulse generator.
B. a static LH secretion.
C. production of estradiol.
D. production of progesterone.
E. the "rescue" of the corpus luteum.

61. In the normal menstrual cycle, the luteal phase is characterized by

A. a decline in circulating progesterone.
B. endometrial proliferation.
C. endometrial secretion.
D. pregnancy.
E. the secretion of chorionic gonadotropin.

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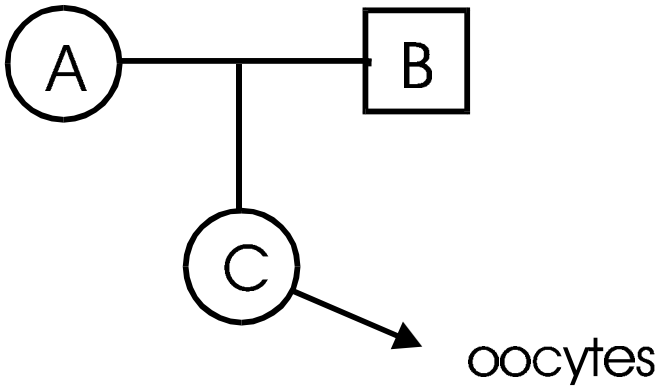
62. In males, FSH and LH stimulate the

A. anterior pituitary.
B. hypothalamus and prostate, respectively.
C. Leydig cells and Sertoli cells, respectively.
D. Sertoli cells and Leydig cells, respectively.
E. spermatagonia.

63. Testosterone is secreted by

A. Leydig cells.
B. Sertoli cells.
C. Sertoli and Leydig cells.
D. spermatogonia.
E. the glomerulosa of the adrenal cortex.



64. The diagram above depicts a simple pedigree for the woman, "C." Half the DNA in her body is from her mother, "A," and the other half is from her father, "B." When C's oocytes complete meiosis, they contain

A. a diploid set of chromosomes.
B. a random distribution of DNA from A and B.
C. either the DNA from A or B.
D. no DNA from either A or B.
E. unequal amounts of DNA from A and B.

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65. Adrenocorticotrophin (ACTH) secretion is inhibited by

A. adrenalectomy.
B. cortisol.
C. hyperglycemia.
D. metyrapone.
E. RU 486.

66. All of the following statements about Antidiuretic Hormone (ADH) are true **EXCEPT**:

A. A deficiency causes diabetes insipidus.
B. It is synthesized in the supraoptic nucleus of the hypothalamus.
C. It regulates fluid osmolality and volume.
D. Solute diuresis potentiates its actions on the renal tubule.
E. Water deprivation stimulates its release.

67. All of the following are associated with menopause **EXCEPT**:

A. decreased secretion of estrogens.
B. hot flashes.
C. increased risk of cardiovascular disease.
D. increased risk of osteoporosis.
E. loss of the GnRH pulse generator.

68. Early in fetal life, the testes must produce which hormone(s) for normal male development?

A. chorionic gonadotropin
B. estradiol and testosterone
C. Mullerian inhibiting substance
D. testosterone
E. testosterone and Mullerian inhibiting substance

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69. A patient with a fever in a room at 25^{o} will

A. have a flushed appearance.
B. have an increased thermoregulatory setpoint.
C. have a relatively thin insulating shell.
D. sweat profusely.
E. all of the above.

70. Heat stroke

A. does not impair normal thermoregulation.
B. elevates the thermoregulatory setpoint.
C. is promoted by strenuous exercise.
D. produces no change in core temperature.
E. results from circulatory shock.

DIRECTIONS: Each group of questions below consists of five lettered headings or a diagram with five lettered components, followed by a list of numbered word, phrases, or statements. For each numbered word, phrase, or statement, select the one lettered component that is most closely associated with it.

A. corticotropin releasing hormone (CRH)
B. dopamine
C. gonadotropin releasing hormone (GnRH)
D. thyrotropin releasing hormone (TRH)
E. somatostatin

71. Inhibits secretion of many hormones

72. Inhibits prolactin secretion

73. Secretion is necessary for normal thyroid function.

A. Addison's disease
B. Cushing's disease
C. diabetes mellitus
D. Graves' disease
E. iodide deficiency

74. Adrenal insufficiency

75. Increased basal metabolic rate (BMR)

76. Hypothyroidism

77. Fat accumulation on the face and trunk, hypertension, and an increased susceptibility to bruising

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A. 11-hydroxylase deficiency
B. acromegaly
C. hyperthyroidism
D. hypothyroidism
E. testicular feminization

78. Impaired production of aldosterone and cortisol, accompanied by oversecretion of androgens

79. Defective receptors for testosterone

80. Cretinous dwarf

A. chorionic gonadotropin
B. estradiol
C. placental lactogen
D. progesterone
E. prolactin

81. Secretion is directly related to placental mass.

82. Basis of serum/urine tests for pregnancy.

83. Most important hormone secreted by the corpus luteum.

84. Secreted by the conceptus.

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A. congenital adrenal hyperplasia
B. Cushing's disease
C. Klinefelter's syndrome
D. pseudohyperaldosteronism
E. Turner's syndrome

85. 21-hydroxylase deficiency

86. 11β -hydroxysteroid dehydrogenase deficiency

87. Missing Y chromosome

Directions: Each set of lettered headings below is followed by a list of numbered words or phrases. For each numbered word or phrase select

A. if the item is associated with (A) only.
B. if the item is associated with (B) only.
C. if the item is associated with both (A) and (B).
D. if the item is associated with neither (A) nor (B).

(A) epinephrine
(B) glucagon

88. Decreases sensitivity to insulin of muscle and fat

89. Increased secretion in response to hypoglycemia.

90. Increases fatty acid esterification

(A) glucagon
(B) insulin

91. Secretion is regulated by circulating glucose concentrations.

92. Decreases serum glucose concentrations

93. Secreted by the pancreatic α cells

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C. if the item is associated with both (A) and (B).
D. if the item is associated with neither (A) nor (B).

(A) growth hormone
(B) thyroid hormone

94. Actions are mediated, in part, by somatomedin C (IGF-1)

95. Deficiency in the infant can lead to dwarfism.

96. Polypeptide

(A) testosterone
(B) estradiol

97. Synthesized in males

98. Converted to a more active form in the cytosol of certain target cells

(A) iodide deficiency
(B) Graves' disease

99. Goiter

100. Stimulation of thyrotropin release

Answers:

41. D
42. D
43. A
44. C
45. C
46. E
47. B
48. D
49. A
50. C
51. E
52. C
53. E
54. D
55. D
56. E
57. B
58. E
59. C
60. C
61. C
62. D
63. A
64. B
65. B
66. D
67. E
68. E
69. B
70. C
71. E
72. B
73. D
74. A
75. D
76. E
77. B
78. A
79. E
80. D
81. C
82. A
83. D
84. A
85. A
86. D
87. E
88. A
89. C
90. D
91. C
92. B
93. A
94. A
95. C
96. A
97. C
98. A
99. C
100. A