1998 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.

40. Insulin-sensitive tissues include

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

41. Glucagon-sensitive tissues include

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

42. Rapid intravenous administration of glucose will increase the secretion of

   A. cortisol.
   B. glucagon.
   C. growth hormone.
   D. insulin.
   E. somatomedin-C.

43. 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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44.   A 10-year-old girl arrives in clinic with a 3-week history of increasing fatigue, polyuria, polydipsia, polyphagia, and weight loss. Over the last 2-3 days, she has become increasingly short of breath. Serum glucose is 455 mg/dl (normal < 110) and ketones are positive at l/32 (normal is negative).

        A.   A glucose tolerance test is necessary to make a diagnosis.
        B.   Insulin treatment is necessary.
        C.   The ketones are from excessive carbohydrate oxidation.
        D.   with care, this patient can manage her condition with proper diet alone.
        E.   Her weight loss is caused by insulin excess.

45.   Type I diabetes mellitus (IDDM or juvenile-onset)

        A.   is associated with growth hormone deficiency.
        B.   is characterized by resistance to insulin.
        C.   is treated effectively by oral administration of insulin.
        D.   results from autoimmune destruction of the islet β cells.
        E.   results from anterior pituitary insufficiency.

46.   Insulin was first isolated by the research team of

        A.   Banting and Best.
        B.   Burns and Allen.
        C.   Michaelis and Menten.
        D.   Rebo and Zooty.
        E.   Tinker and Chance.

47.   Insulin

        A.   depresses protein synthesis in muscle.
        B.   decreases glucokinase activity in liver.
        C.   decreases fat synthesis.
        D.   increases glycogenolysis in liver.
        E.   increases glucose permeability of fat and muscle.

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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 influence of glucose on insulin secretion

        A.   is mediated by the cGMP second messenger system.
        B.   is mediated by the glucose receptor on the plasmalemma.
        C.   is unchanged in Type II diabetes mellitus (NIDDM).
        D.   requires glucose metabolism within the islet cell.
        E.   requires new protein synthesis within the islet cell.

50.   Hypoglycemia increases the secretion of all **BUT**

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

51.   1,25-OH cholecalciferol (1,25-OH D_3)

        A.   binds to mineralocorticoid receptors in target cells.
        B.   is converted to 25-OH cholecalciferol (25 OH D_3) in the kidney.
        C.   increases calcium and phosphate absorption in the intestine.
        D.   secretion is inhibited by parathyroid hormone (PTH).
        E.   stimulates secretion of PTH.


52.   Intraveneous administration of calcium

        A.   decreases secretion of calcitonin.
        B.   decreases secretion of parathyroid hormone (PTH).
        C.   increases secretion of calcitonin.
        D.   increases secretion of PTH.
        E.   B and C.

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.

53. Vials X and Y are known to contain either a solution of hormone or a placebo. After five days of daily injections, rats treated with X have smaller adrenal glands and more liver glycogen relative to rats treated with Y. It is likely that

    A.   X contains a glucocorticoid antagonist.
    B.   Y contains a glucocorticoid antagonist.
    C.   X contains adrenocorticotropic hormone (ACTH).
    D.   Y contains ACTH.
    E.   X contains metyrapone.

54. A respiratory quotient of 0.7 suggests that energy is derived

    A.   anerobically.
    B.   from the mixed oxidation of carbohydrates (-80%) and fats (-20%).
    C.   predominantly from the oxidation of carbohydrates.
    D.   predominantly from the oxidation of lipids.
    E.   predominantly from the oxidation of protein.

55. In a fifty-yard dash, the major source of energy is

    A.   anerobic glycolysis.
    B.   breakdown of muscle protein.
    C.   lipid synthesis.
    D.   liver glycogen.
    E.   mixed oxidation of carbohydrates and fat.

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Ligand Concentration [M]
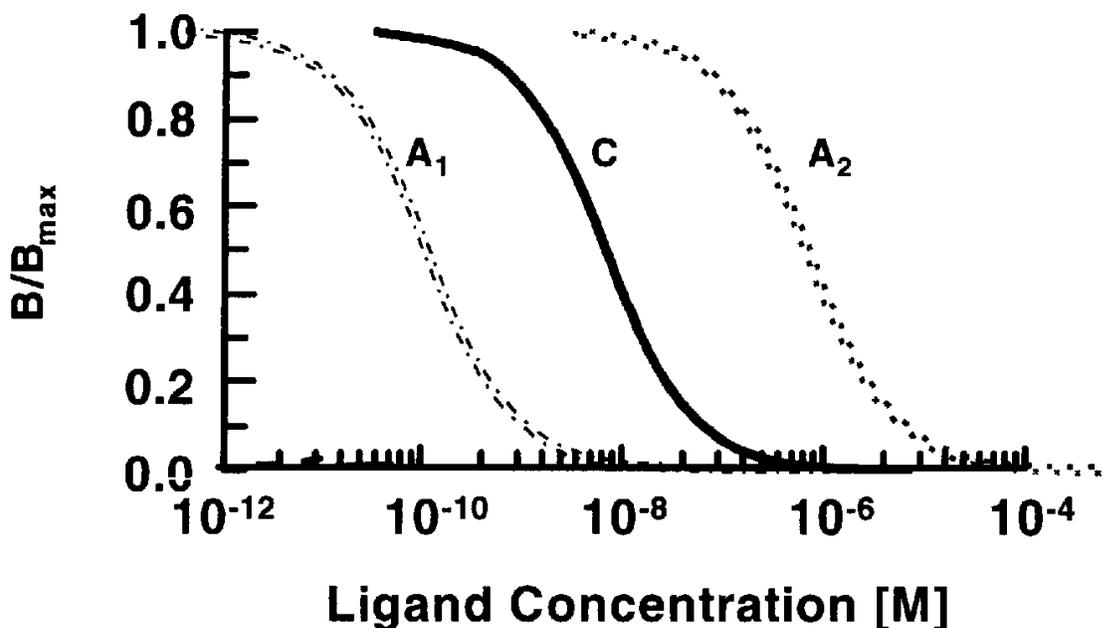
56.   This graph depicts the results from a hypothetical equilibrium displacement experiment using radiolabeled cortisol. "C" represents the addition of nonlabeled cortisol. "A_1" and "A_2" refer to the addition of cortisol analogs. Which of the following statements is true?

   A. A_1 binds to the receptor with a $K_D = 10^{-8}$ M.
   B. A_1 binds with greater cooperativity than A_2.
   C.   A $K_{1/2} = 10^{-6}$ M should be observed in a cortisol dose-response relationship.
   D.   Cortisol binds to the receptor with a $K_D = 10^{-8}$ M.
   E.   The receptor has a greater affinity for A_2 than for cortisol.

57.   The following adjective is used to describe communication between specialized cells and target tissues, mediated by ligands released into the bloodstream:

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

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.

58.   Metabolic screening test of a newborn resulted in the following laboratory findings:

Serum T_4	Low
Resin T_3 Uptake	Low
Serum TSH	Elevated

What do you conclude about this infant's endocrine status?

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

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

A.   a gradual decrease in luteinizing hormone (LH) secretion.
B.   inhibition of the gonadotropin releasing hormone (GnRH) pulse generator.
C.   secretion of estradiol.
D.   secretion of progesterone.
E.   the "rescue" of the corpus luteum.

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

A.   a decline in circulating progesterone.
B.   a rapid increase in circulating luteinizing hormone (LH).
C.   proliferation of the uterine endometrium.
D.   secretion by the uterine endometrium.
E.   the secretion of chorionic gonadotropin (hCG).

61.   Prolactin

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

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.

62.   Testosterone is secreted by

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

63. All of the following are associated with menopause EXCEPT:

        A.   decreased secretion of estrogens.
        B.   decreased secretion of gonadotropins.
        C.   hot flashes.
        D.   increased risk of cardiovascular disease.
        E.   increased risk of osteoporosis.

64.   The fate of most oocytes/follicles is

        A.   atresia.
        B.   conception.
        C.   ovulation.
        D.   Parturition
        E.   stasis.

65.   Licorice-induced hyperaldosteronism results from inhibition of

        A.   5α-steroid reductase.
        B.   11 -steroid hydroxylase.
        C.   11 β-hydroxysteroid dehydrogenase.
        D.   17α-steroid hydroxylase.
        E.   21-steroid hydroxylase.

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.

66.   Hypersecretion of antidiuretic hormone (ADH) results in

        A.   a low urinary osmolality.
        B.   elevated serum sodium concentrations.
        C.   increased renal sodium reabsorption.
        D.   increased thirst.
        E.   retention of water with subsequent volume expansion.

67.   The onset of fever (the "chill") in a room at normal temperature is accompanied by

        A.   a closed posture.
        B.   an increased thermoregulatory setpoint.
        C.   a relatively thick insulating shell.
        D.   shivering.
        E.   all of the above.

68.   Reaction to a hot environment includes

        A.   a decreased sudomotor response.
        B.   a decrease in thermoregulatory setpoint.
        C.   decreased aldosterone secretion.
        D.   dilation of the cutaneous circulation.
        E.   stimulation of the sympathetic nervous system.

69.   In an environment warmer than body temperature, the only means of dissipating body heat is by

        A.   shifting blood flow to the deep veins.
        B.   shivering.
        C.   swearing.
        D.   sweating.
        E.   sympathetic nervous svstem activation.

Directions: Each group of questions below consists of five lettered word or phrase pairs, followed by a list of numbered word or phrase pairs. Consider carefully the relationships between the members of each pair. For each numbered word or phrase pair, select the *one* lettered pair whose relationship is *most* similar.

A.	gonadotropin releasing hormone (GnRH) : follicle stimulating hormone (FSH)
B.	insulin : glucagon
C.	proinsulin : insulin
D.	testosterone : dihydrotestosterone
E.	testosterone : estradiol

70.   thyrotropin releasing hormone (TRH) : thyrotropin (TSH)

71.   thyroxine (T$_4$) : triiodothreonine (T$_3$)

72.   proopiomelanocortin (POMC) : adrenocorticotropic hormone (ACTH)

73.   corticosterone : aldosterone

A.	adrenal medulla : sympathetic postganglionic neuron
B.	hypothalamus : anterior pituitary
C.	osteoblasts : osteoclasts
D.	thyroid : parathyroid
E.	wolffian duct : male reproductive tract

74.   graafian follicle : corpus luteum

75.   corticotrophs : adrenocortical fasiculata

Directions: Each group of questions below consists of five lettered headings or a diagram with five lettered components, followed by a list of numbered words, 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.   growth hormone releasing hormone (GHRH)
      C.   gonadotropin releasing hormone (GnRH)
      D.   thyrotropin releasing hormone (TRH)
      E.   somatostatin

76.   Inhibits secretion of several polypeptide hormones

77.   Pulsatile secretion is necessary for normal physiological function

78.   Stimulates the somatotropes of the anterior pituitary

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

79.   Increased basal metabolic rate (BMR)

80.   Autoimmune disorder resulting in hyperthyroidism

81.   Fat accumulation in the trunk, moon facies, and hypertension

82.   Adrenal insufficiency

A. acromegaly
B. congenital adrenal hyperplasia
C. hypothyroidism
D. pheochromocytoma
E. testicular feminization

83. 21-hydroxylase deficiency

84. Adrenomedullary hypersecretion

85. Excess growth hormone secretion in an adult

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

86. First endocrine recognition of pregnancy

87. Thermogenic

88. Secretion is directly related to placental mass

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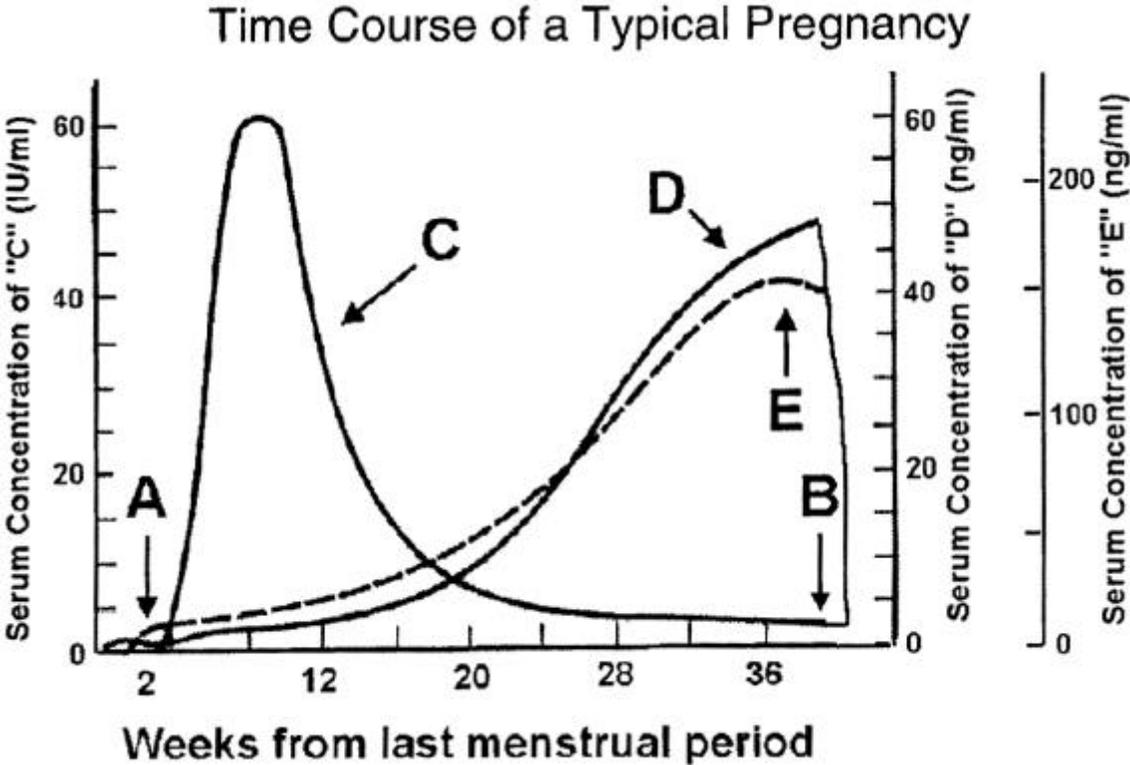
Time Course of a Typical Pregnancy

89.   Chorionic gonadotropin (hCG)

90.   Estrogens

91.   Parturition

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)   iodide deficiency
    (B)   Graves' disease

92.   Goiter

93.   Inhibition of thyrotropin secretion

    (A)   aldosterone
    (B)   cortisol

94.   Enhanced NaCi absorption in the sweat duct during acclimation to a hot environment

95.   Enhanced secretion associated with 11-hydroxylase deficiency

96.   Enhanced secretion associated with 17α-hydroxylase deficiency

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    (A)   Sertoli cells
    (B)   Leydig cells

97.   Protects and nourishes developing sperm

98.   Secretes inhibin

99.   Stimulated by luteinizing hormone (LH)

Answers:

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