Using Figure 16.1, match the following:

1) Produces the hormones that promote the development of the female secondary sexual characteristics at puberty.
   Answer: D

2) Storehouse for the hormones produced by the hypothalamus of the brain.
   Answer: B

3) Produces the hormones that direct the production of the secondary male sex characteristics.
   Answer: E

4) Produce steroid hormones and glucocorticoids and mineralocorticoids.
   Answer: C
5) Produces hormones and is considered a neuroendocrine organ.  
Answer: A

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**Figure 16.2**

*Using Figure 16.2, match the following hypothalamic hormones with the pituitary hormone targets:*

6) Growth hormone-releasing hormone (GHRH).  
   Answer: A

7) Gonadotropin-releasing hormone (GnRH).  
   Answer: C

8) Prolactin-releasing hormone (PRH).  
   Answer: B

9) Corticotropin-releasing hormone (CRH).  
   Answer: E

10) Thyrotropin-releasing hormone (TRH).  
    Answer: D
MATCHING. Choose the item in column 2 that best matches each item in column 1.

**Match the following:**

11) An autoimmune problem involving the thyroid gland.
   Answer: C
   A) Diabetes mellitus
   B) Acromegaly

12) Hyposecretion of growth hormone.
   Answer: D
   C) Graves’ disease
   D) Pituitary dwarfism

13) Hyposecretion of the pancreas.
   Answer: A
   E) Addison’s disease

14) Hyposecretion of the adrenal cortex.
   Answer: E

15) Hypersecretion of growth hormone.
   Answer: B

**Match the following:**

16) Hyposecretion of the thyroid in adults.
   Answer: A
   B) Acromegaly

17) Hypersecretion of the adrenal cortex.
   Answer: D
   C) Cretinism
   D) Cushing’s disease

18) Hypersecretion of growth hormone.
   Answer: B

19) Hyposecretion of the thyroid in infants.
   Answer: C

**Match the following:**

20) The size and shape of a pea; produces hormones that stimulate other endocrine glands.
   Answer: B
   A) Adrenal medulla
   B) Hypophysis

21) The gland that controls the fight-or-flight reaction.
   Answer: A
22) Produces hormones that regulate glucose levels in the body.
   Answer: C

23) Produces a hormone that controls blood levels of calcium and potassium by their removal from bone tissue.
   Answer: A

24) Produces the body's major metabolic hormones.
   Answer: B

Matching; match the labeled organ with the most appropriate response or identification.

Using Figure 16.3, match the following:
25) Produces glucocorticoids.
   Answer: B

26) Produces epinephrine.
   Answer: D

27) Produces aldosterone.
   Answer: A
28) Excess hormone levels result in Cushing’s syndrome.
   Answer: A

29) Hormones mimic sympathetic nervous system neurotransmitters.
   Answer: D

30) Produces androgens.
   Answer: C

TRUE/FALSE. Answer A if the statement is true and B if the statement is false.

31) The antagonistic hormones that regulate the blood calcium level are calcitonin-parathormone.
   Answer: True  False

32) The hormone that raises blood sugar levels is insulin.
   Answer: True  False

33) Addison’s disease is due to a deficit output of glucocorticoids only.
   Answer: True  False

34) ACTH stimulates the adrenal cortex to release corticosteroid hormones.
   Answer: True  False

35) LH is also referred to as a gonadotropin.
   Answer: True  False

36) Oxytocin is a strong stimulant of uterine contractions.
   Answer: True  False

37) Follicle cells of the thyroid gland produce thyroglobulin, while follicle cells of the parathyroid produce calcitonin.
   Answer: True  False

38) Type 2 diabetics may reflect declining receptor sensitivity to insulin rather than decreased insulin production.
   Answer: True  False

39) The prime metabolic effect of cortisol is gluconeogenesis.
   Answer: True  False

40) The beta cells are the pancreatic islet cells that produce insulin.
   Answer: True  False

41) Most type 2 diabetics do not produce insulin.
   Answer: True  False
42) Aldosterone is the most potent mineralocorticoid produced in the adrenals but the least abundant.
Answer: True False

43) Atrial natriuretic peptide is a hormone that controls blood pressure in part by increasing the urinary excretion of sodium.
Answer: True False

44) The thyroid gland is a large gland that controls metabolic functions throughout the life of an individual.
Answer: True False

45) All of the following hormones are secreted by the adenohypophysis: ACTH, FSH, and LH.
Answer: True False

46) Iodine is an essential element required for the synthesis of thyroxine.
Answer: True False

47) The endocrine gland that is probably malfunctioning if a person has a high metabolic rate is the parathyroid.
Answer: True False

48) Growth hormone always exerts its influence by targeting other endocrine glands to produce hormones.
Answer: True False

49) Glucocorticoids are steroid hormones that usually enhance the immune responses when an individual is suffering from severe stress.
Answer: True False

50) Direct gene activation involves a second-messenger system.
Answer: True False

51) 
Answer: True False

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

52) Gluconeogenesis occurs in the liver due to the action of ________.
   A) aldosterone  B) cortisol  C) secretin  D) insulin
Answer: B

53) Virtually all of the protein or amino acid-based hormones exert their effects through intracellular ________.
   A) deactivators  B) second messengers  C) ions  D) nucleotides
Answer: B
54) Which of the following is not a category of endocrine gland stimulus?  
A) enzyme  
B) hormonal  
C) neural  
D) humoral  
Answer: A

55) Chemical substances secreted by cells into the extracellular fluids and that regulate the metabolic function of other cells in the body are called ________.  
A) proteins  
B) enzymes  
C) antibodies  
D) hormones  
Answer: D

56) The hypothalamic-hypophyseal tract ________.
   A) conducts aldosterone to the hypophysis  
   B) is the site of prolactin synthesis  
   C) connects the hypophysis to the pituitary gland  
   D) is partly contained within the infundibulum  
Answer: D

57) Which of the following is not a cardinal sign of diabetes mellitus?  
A) polydipsia  
B) polyphagia  
C) polyuria  
D) All of these are signs.  
Answer: D

58) Which of the choices below is not a factor required for target cell activation by hormone receptor interaction?  
A) blood levels of hormone  
B) strength of the bond between the receptor and hormone  
C) number of receptors for that hormone  
D) type of hormone  
Answer: D

59) Oxytocin ________.
   A) controls milk production  
   B) exerts its most important effects during menstruation  
   C) release is an example of a positive feedback control mechanism  
   D) is an adenohypophyseal secretion  
Answer: C

60) ADH ________.
   A) promotes dehydration  
   B) is produced in the adenohypophysis  
   C) increases urine production  
   D) is inhibited by alcohol  
Answer: D

61) Thyroid hormone exerts its influence by ________.
   A) causing a reduction in the number of blood vessel adrenergic receptors, and therefore decreasing blood pressure  
   B) entering some cells and binding to intracellular receptors within the nuclei  
   C) acting to decrease basal metabolic rate  
   D) exerting only a minor effect on body metabolism  
Answer: B
62) Gonadocorticoid(s) ________.
   A) production by the adrenal gland is insignificant compared with sex hormone release from
      the gonads during late puberty
   B) secretion inhibition is highly dependent on a negative feedback loop involving ACTH
   C) synthesized by the adrenal medulla are primarily androgens
   D) hypersecretion can result in adrenogenital syndrome, also called feminization
   Answer: A

63) Sometimes prolonged excessive exposure to high hormone concentrations causes a
phenomenon known as ________.
   A) down-regulation
   B) metabolism of protein kinases
   C) cellular inhibition
   D) diabetes mellitus
   Answer: A

64) Which of the following is not a change that may be caused by hormonal stimulus?
   A) an increase in enzymatic activity
   B) direct control of the nervous system
   C) a change in membrane potential
   D) the stimulation of a genetic event resulting in protein synthesis
   Answer: B

65) The ability of a specific tissue or organ to respond to the presence of a hormone is dependent
on ________.
   A) the membrane potential of the cells of the target organ
   B) the presence of the appropriate receptors on the cells of the target tissue or organ
   C) nothing—all hormones of the human body are able to stimulate any and all cell types
      because hormones are powerful and nonspecific
   D) the location of the tissue or organ with respect to the circulatory path
   Answer: B

66) Several hormones are synthesized in the hypothalamus and transported to the anterior
pituitary gland. The mechanism of transportation from hypothalamus to anterior pituitary
gland is through the ________.
   A) hepatic portal system
   B) feedback loop
   C) hypophyseal portal system
   D) general circulatory system
   Answer: C

67) The neurohypophysis or posterior lobe of the pituitary gland is not a true endocrine gland
because ________.
   A) embryonically it was an endocrine tissue, but in the adult human it is no longer
      functional
   B) it is unable to function as an endocrine tissue because it is actually part of the neural
      system due to its location
   C) it is strictly a part of the neural system and has little or nothing to do with hormonal
      release
   D) it is only a hormone storage area that receives hormones from the hypothalamus for
      release
   Answer: D
Steroid hormones exert their action by ________.  A) stimulating the synthesis of a glycogen  
B) increasing blood pressure  
C) finding an appropriate cell receptor and initiating cAMP activity  
D) entering the nucleus of a cell and initiating or altering the expression of a gene

Answer: D

The second-messenger mechanism of hormone action operates by ________.  A) increasing the basal metabolic rate in the target organ  
B) not responding to a feedback mechanism  
C) binding to specific receptors and employing the services of G proteins and cAMP  
D) synthesizing more of the hormone than is actually needed

Answer: C

Hormones often cause a cell to elicit multiple responses; this is because ________.  A) there are thousands of receptors on the cell membrane  
B) during protein kinase activation, enzymes phosphorylate many other enzymes  
C) the protein kinases are rapidly metabolized  
D) the receptors bind to several hormones at the same time

Answer: B

Cells that respond to peptide hormones usually do so through a sequence of biochemical reactions involving receptor and kinase activation. In order for cells to respond, it is necessary for first and second messengers to communicate. This is possible because ________.  A) peptide hormones always enter the cell membrane and elicit a response without assistance from other messengers  
B) hormones alter cellular operations through stimulation of a gene directly  
C) the hormone receptor complex moves into the cytoplasm as a unit  
D) G protein acts as the link between first and second messengers

Answer: D

Thyroid hormone (a small iodinated amine) enters target cells in a manner similar to ________.  A) glucagon, because the structure of glucagon is similar to that of thyroid hormone  
B) steroid hormones, because both diffuse easily into target cells  
C) growth hormone, because the thyroid works synergistically with thyroid hormone  
D) insulin, because insulin is a small peptide

Answer: B

When it becomes necessary to enlist the fight-or-flight response, a hormone that is released during the alarm phase of the general adaptation syndrome is ________.  A) angiotensinogen  
B) epinephrine  
C) estrogen  
D) renin

Answer: B

One of the least complicated of the endocrine control systems directly responds to changing blood levels of ions and nutrients. Which of the following describes this mechanism?  A) humoral stimulation  
B) protein synthesis  
C) the rapid oxidation of carbohydrates  
D) catabolic inhibition

Answer: A
75) The major targets of growth hormone are ________.
   A) the liver  B) the blood vessels
   C) bones and skeletal muscles  D) the adrenal glands
   Answer: C

76) The parathyroid glands maintain adequate levels of blood calcium. This is accomplished through ________.
   A) targeting the bone and activating osteoclasts so that calcium will be released
   B) antagonizing the synthesis of calcitonin
   C) blocking the action of growth hormone
   D) slowing the activity of tissues that require calcium for activity
   Answer: A

77) Which organ is responsible for synthesizing ANP?
   A) the heart  B) the spleen  C) the skin  D) the kidney
   Answer: A

78) Mineralocorticoid is to aldosterone as glucocorticoid is to ________.
   A) testosterone  B) epinephrine  C) cortisol  D) estrogen
   Answer: C

79) Leptin is secreted by ________.
   A) adipocytes  B) fibroblasts  C) lymphocytes  D) goblet cells
   Answer: A

80) The most important regulator of electrolyte concentrations in extracellular fluids is ________.
   A) glucagon  B) aldosterone  C) cortisol  D) insulin
   Answer: B

81) Which of the following is not a steroid-based hormone?
   A) epinephrine  B) aldosterone  C) estrogen  D) cortisone
   Answer: A

82) Which of the following would be associated with the action of steroids on cells?
   A) a hormone-receptor complex that interacts directly with the cell’s DNA
   B) extracellular receptors with a specificity for only a single amino acid sequence on the hormone
   C) second-messenger systems
   D) an enzyme that catalyzes the formation of cyclic AMP
   Answer: A

83) Regulating hormones from the hypothalamus ________.
   A) travel by arteries to the pituitary
   B) enter the hepatic portal system, which feeds the pituitary
   C) first enter into the hypophyseal portal system
   D) enter venous circulation and travel to the heart, which pumps the hormone-containing blood to the pituitary
   Answer: C
84) ACTH ________.
   A) secretion is regulated by a hypothalamic secretion
   B) is secreted by the posterior pituitary
   C) causes the release of hormones from the adrenal medulla
   D) is not a tropic hormone
   Answer: A

85) Which of the following is true about calcium homeostasis?
   A) High calcium levels cause bone resorption.
   B) Increased calcitonin levels will cause increased blood calcium levels.
   C) Parathyroid hormone is the single most important regulator of calcium levels in the blood.
   D) Parathyroid hormone causes an increase in osteoblast activity.
   Answer: C

86) Aldosterone ________.
   A) production is greatly influenced by ACTH
   B) presence increases potassium concentration in the blood
   C) is secreted by the neurohypophysis
   D) functions to increase sodium reabsorption
   Answer: D

87) The only amine hormone to act like a steroid is ________.
   A) ACTH    B) ADH      C) TH      D) GH
   Answer: C

88) Which organ does not have hormone production?
   A) heart       B) liver   C) kidney   D) skin
   Answer: B

89) In circumstances where the body requires prolonged or increased levels of a hormone, the DNA of target cells will specify the synthesis of more receptors on the surface of the cells of the target organ. This is known as ________.
   A) a reaction to a stressor       B) cellular affinity
   C) the cell’s sensitivity reaction  D) up-regulation
   Answer: D

90) Eicosanoids do not include ________.
   A) leukotrienes          B) prostaglandins
   C) hydrocortisones      D) paracrines
   Answer: C
91) A man has been told that he is *not* synthesizing enough follicle-stimulating hormone (FSH), and for this reason he may be unable to father a child. Choose the correct statement to explain this problem.

A) FSH stimulates estrogen secretion by ovarian cells; therefore it is not synthesized by males.
B) The man must be producing progesterone, which inhibits the synthesis of FSH.
C) FSH stimulates sperm production in the testes.
D) The physician is wrong—a hormone made in the adenohypophysis could not influence fertility.

Answer: C

92) Which of the following organs is affected by thyroid hormone in adults?

A) brain  B) liver  C) spleen  D) thyroid gland

Answer: B

93) Thyroxine is a peptide hormone, but its mechanism is different from other peptide hormones. Which of the following statements is true concerning this difference?

A) It causes positive feedback.
B) It is a stimulant of cellular metabolism and targets all cells.
C) It does not require a second messenger to effect a response.
D) It is very specific in the cell type it targets.

Answer: C

94) How do glucocorticoids enable the body to deal appropriately with stress?

A) by stimulating the pancreas to release insulin
B) by blocking the neurotransmitters that prepare the body for the stress response
C) by decreasing the heart rate, thus decreasing blood pressure
D) by increasing blood glucose, fatty acid, and amino acid levels and enhancing blood pressure

Answer: D

95) What ion is sometimes used as a second messenger of amino acid—based hormones?

A) chlorine  B) iron  C) sodium  D) calcium

Answer: D

96) All adenohypophyseal hormones except GH affect their target cells via a cyclic AMP second messenger.

Answer: True

97) All peptide hormone synthesis requires gene activation that produces mRNA.

Answer: True

98) Iodine is an essential element required for the synthesis of thyroxine.

Answer: True
99) The endocrine gland that is probably malfunctioning if a person has a high metabolic rate is the parathyroid.

Answer: True   False

100) Gluconeogenesis occurs in the liver due to the action of insulin.

Answer: True   False