Using Figure 9.1, identify the following:

1) The gland that produces thymosin is indicated by letter __________.
   Answer: F
   Diff: 2  Page Ref: 314; 329

2) The gland that produces melatonin is indicated by letter __________.
   Answer: A
   Diff: 2  Page Ref: 314; 329

3) The gland that produces testosterone is indicated by letter __________.
   Answer: J
   Diff: 2  Page Ref: 314; 329

4) The glands that produce steroids and catecholamines are indicated by letter __________.
   Answer: G
   Diff: 2  Page Ref: 314; 322-326

5) The producer of hormones released by the posterior pituitary is indicated by letter __________.
   Answer: B
   Diff: 2  Page Ref: 314; 316-318
6) The gland that produces insulin and glucagon is indicated by letter __________.
   Answer: H
   Diff: 2  Page Ref: 314; 326

7) The glands that act as antagonists to the thyroid gland are indicated by letter __________.
   Answer: E
   Diff: 2  Page Ref: 314; 321

8) The gland that has both glandular and nervous tissue associated with it is indicated by letter __________.
   Answer: C
   Diff: 2  Page Ref: 314

9) The gland that is the major producer of female hormones is indicated by letter __________.
   Answer: I
   Diff: 2  Page Ref: 314; 329

10) The gland that is primarily responsible for body metabolism is indicated by letter __________.
    Answer: D
    Diff: 2  Page Ref: 314; 319

11) The thymus gland is indicated by letter __________.
    Answer: F
    Diff: 1  Page Ref: 314; 329

12) The pancreas is indicated by letter __________.
    Answer: H
    Diff: 1  Page Ref: 314; 326

13) The pineal gland is indicated by letter __________.
    Answer: A
    Diff: 1  Page Ref: 314; 329

14) The parathyroid glands are indicated by letter __________.
    Answer: E
    Diff: 1  Page Ref: 314; 321

Fill in the blank or provide a short answer:
15) Hypersecretion of growth hormone during childhood results in __________.
    Answer: gigantism
    Diff: 2  Page Ref: 314

16) Adrenocorticotropic hormone stimulates the cortex portion of the __________ gland.
    Answer: adrenal
    Diff: 2  Page Ref: 315

17) The posterior pituitary gland releases two hormones called __________ and __________.
    Answer: oxytocin; antidiuretic hormone
    Diff: 2  Page Ref: 318
18) Another name for antidiuretic hormone (ADH) is __________.
   Answer: vasopressin
   Diff: 2 Page Ref: 318-319

19) An enlargement of the thyroid gland is called a __________.
   Answer: goiter
   Diff: 1 Page Ref: 319

20) Anteriorly protruding eyes associated with hyperthyroidism is called __________.
   Answer: exophthalmos
   Diff: 2 Page Ref: 320

21) Calcitonin is made by the __________ of the thyroid gland.
   Answer: parafollicular cells
   Diff: 3 Page Ref: 320

22) Mineralocorticoids regulate the concentration of ________ and ________ ions in our blood.
   Answer: sodium; potassium
   Diff: 2 Page Ref: 322-323

23) Cortisone and cortisol and types of __________ produced by the middle cortical layer of the adrenal gland.
   Answer: glucocorticoids
   Diff: 2 Page Ref: 323

24) The enzyme produced by the kidneys when blood pressure drops, which causes the release of aldosterone, is called __________.
   Answer: renin
   Diff: 3 Page Ref: 323

25) Male sex hormones produced by the adrenal cortex are called __________.
   Answer: androgens
   Diff: 1 Page Ref: 324

26) Generalized hyosecretion of all adrenal cortex hormones leads to __________.
   Answer: Addison’s disease
   Diff: 3 Page Ref: 324

27) Hypersecretion of glucocorticoids, often caused by a tumor, results in __________.
   Answer: Cushing’s syndrome
   Diff: 3 Page Ref: 324

28) Another name for epinephrine is __________.
   Answer: adrenaline
   Diff: 2 Page Ref: 325

29) Insulin and glucagon are both hormones that are produced by __________.
   Answer: pancreatic islet cells
   Diff: 2 Page Ref: 326
30) Glucagon acts as an antagonist to a hormone called __________.
   Answer: insulin
   Diff: 1 Page Ref: 326

31) Polyuria, polydipsia, and polyphagia are indicative of a disease called __________.
   Answer: diabetes mellitus
   Diff: 2 Page Ref: 326

32) A hormone called __________ is believed to play an important role in establishing the body's day-night cycle.
   Answer: melatonin
   Diff: 3 Page Ref: 329

33) A hormone called __________ plays an important role in incubating a special group of white blood cells.
   Answer: thymosin
   Diff: 3 Page Ref: 329

34) The __________ cells of the testes produce testosterone.
   Answer: interstitial
   Diff: 2 Page Ref: 316

35) Home pregnancy tests check for a hormone in the female's urine called __________.
   Answer: human chorionic gonadotropin (hCG)
   Diff: 3 Page Ref: 332

Multiple Choice

1) Which one of the following is NOT one of the major processes controlled by hormones:
   A) body coordination
   B) mobilizing body defenses against stressors
   C) maintaining electrolyte balance
   D) regulating cellular metabolism
   E) growth and development
   Answer: A
   Diff: 1 Page Ref: 310

2) The chemical messengers of the endocrine system are known as:
   A) effectors
   B) target cells
   C) hormones
   D) neurons
   E) stimuli
   Answer: C
   Diff: 1 Page Ref: 310
3) Which one of the following is NOT typical of the changes that follow the binding of a hormone to its target cells:
   A) plasma membrane permeability changes
   B) cellular mutations occur
   C) enzymes are activated or inactivated
   D) mitosis is stimulated
   E) proteins are synthesized in the cell

Answer: B  
Diff. 3  Page Ref. 311

4) Prostaglandins are:
   A) amino acid–based hormones
   B) steroid hormones
   C) lipid hormones manufactured in cell plasma membranes
   D) glycerol hormones
   E) target organs

Answer: C  
Diff. 3  Page Ref. 311

5) Being lipid soluble, steroids can do all the following EXCEPT:
   A) diffuse through the plasma membranes of target cells
   B) catalyze cyclic AMP
   C) enter the nucleus
   D) bind to receptor proteins within the nucleus
   E) activate genes to transcribe mRNA for protein synthesis

Answer: B  
Diff. 3  Page Ref. 311

6) Negative feedback mechanisms regulate:
   A) steroid hormones only
   B) amino acid–based hormones only
   C) prostaglandin hormones only
   D) very few hormones
   E) most hormones

Answer: E  
Diff. 3  Page Ref. 311

7) Most endocrine organs are prodded into action by other hormones; this type of stimulus is called:
   A) hormonal stimulus
   B) humoral stimulus
   C) neural stimulus
   D) receptor–mediated stimulus
   E) steroid stimulus

Answer: A  
Diff. 2  Page Ref. 311–312
8) Tropic hormones:
   A) stimulate the pineal gland to secrete hormones
   B) stimulate the thymus gland to secrete hormones
   C) stimulate other endocrine glands to secrete hormones
   D) stimulate nervous tissue
   E) stimulate prostaglandins
Answer: C
Diff: 2 Page Ref: 314

9) Growth hormone:
   A) is secreted by the thymus gland
   B) prevents urine production
   C) promotes growth in long bones and skeletal muscles
   D) is produced by the thyroid gland
   E) results in Cushing’s disease if produced in excess
Answer: C
Diff: 3 Page Ref: 314

10) Which one of the following is NOT an anterior pituitary hormone:
    A) prolactin
    B) adrenocorticotropic hormone
    C) follicle-stimulating hormone
    D) antidiuretic hormone
    E) luteinizing hormone
Answer: D
Diff: 3 Page Ref: 314-316

11) The hormone that triggers ovulation of an egg from the female ovary is:
    A) luteinizing hormone
    B) prolactin
    C) follicle-stimulating hormone
    D) progesterone
    E) interstitial cell-stimulating hormone
Answer: A
Diff: 3 Page Ref: 316

12) Hypersecretion of growth hormone after long bone growth has ended (as an adult) is called:
    A) pituitary dwarfism
    B) Cushing’s disease
    C) acromegaly
    D) myxedema
    E) gigantism
Answer: E
Diff: 2 Page Ref: 314
13) The hypothalamus is most closely associated with the:
   A) pineal gland  
   B) pituitary gland  
   C) thymus gland  
   D) thyroid gland  
   E) pancreas
Answer: B  
Diff: 2  Page Ref: 316; 318

14) An enlargement of the thyroid gland resulting from a deficiency of dietary iodine is called:
   A) exophthalmos  
   B) goiter  
   C) cretinism  
   D) myxedema  
   E) acromegaly
Answer: B  
Diff: 1  Page Ref: 319

15) Which one of the following is NOT a function of oxytocin:
   A) stimulation of uterine contractions  
   B) stimulation of breast milk ejection  
   C) stimulation of menstruation  
   D) postpartum bleeding control  
   E) labor induction
Answer: C  
Diff: 2  Page Ref: 318

16) Diabetes insipidus is caused by hyposcretion of:
   A) antidiuretic hormone (ADH)  
   B) growth hormone  
   C) glucagon  
   D) parathyroid hormone (PTH)  
   E) prolactin (PRL)
Answer: A  
Diff: 3  Page Ref: 319

17) Which one of the following hormones exerts its primary effects on the reproductive organs:
   A) follicle–stimulating hormone  
   B) adrenocorticotropic hormone  
   C) prolactin  
   D) thyroid–stimulating hormone  
   E) growth hormone
Answer: A  
Diff: 2  Page Ref: 316
18) Alcohol inhibits the secretion of:
   A) parathyroid hormone (PTH)
   B) antidiuretic hormone (ADH)
   C) glucagon
   D) oxytocin
   E) prolactin (PRL)
Answer: B
Diff: 3   Page Ref: 319

19) The thyroid gland is located:
   A) above the kidneys
   B) below the Adam's apple
   C) within the mediastinum
   D) within the pancreas
   E) within the parathyroid glands
Answer: B
Diff: 1   Page Ref: 319

20) The body's major metabolic hormone is called:
   A) prolactin
   B) growth hormone
   C) adrenaline
   D) thyroid hormone
   E) calcitonin
Answer: D
Diff: 2   Page Ref: 319

21) The element necessary in the diet for proper thyroid function is:
   A) sodium
   B) potassium
   C) calcium
   D) iodine
   E) bromine
Answer: D
Diff: 1   Page Ref: 319

22) Hyposecretion of thyroxine in early childhood leads to:
   A) cretinism
   B) dwarfism
   C) myxedema
   D) exophthalmos
   E) acromegaly
Answer: A
Diff: 3   Page Ref: 319
23) Which of these hormones regulate calcium levels in the body:
   A) T3 and T4
   B) calcitonin and parathyroid hormone
   C) oxytocin and prolactin
   D) insulin and glucagon
   E) melatonin and glucocorticoids
Answer: B
Diff: 2 Page Ref: 320-321

24) Which one of the following is NOT produced by the adrenal cortex:
   A) mineralocorticoids
   B) glucocorticoids
   C) sex hormones
   D) epinephrine
   E) aldosterone
Answer: D
Diff: 2 Page Ref: 322-324

25) Which of these hormones is released by the adrenal medulla:
   A) sex hormones
   B) aldosterone
   C) cortisone
   D) glucocorticoids
   E) epinephrine
Answer: E
Diff: 2 Page Ref: 324-326

26) Rising blood levels of aldosterone cause the kidney tubules to:
   A) reabsorb potassium
   B) reabsorb sodium
   C) reabsorb calcium
   D) reabsorb iodine
   E) reabsorb hydrogen
Answer: B
Diff: 3 Page Ref: 323

27) Tetany resulting from uncontrolled muscle spasms may indicate a malfunction of the:
   A) pineal gland
   B) thymus
   C) parathyroid glands
   D) adrenal cortex
   E) posterior pituitary
Answer: C
Diff: 2 Page Ref: 321
28) The enzyme produced by the kidneys when blood pressure drops, stimulating a release of aldosterone, is called:
   A) cortisone
   B) renin
   C) cortisol
   D) vasopressin
   E) angiotensin
Answer: B  Diff: 2  Page Ref: 323

29) Glucocorticoids do all of the following EXCEPT:
   A) help resist long-term stress
   B) increase blood glucose levels
   C) decrease edema
   D) suppress inflammation
   E) regulate salt content of the blood
Answer: E  Diff: 2  Page Ref: 323

30) Which one of the following is NOT a symptom of Cushing's syndrome:
   A) moon face
   B) bronze skin tones
   C) buffalo hump
   D) high blood pressure
   E) water retention
Answer: B  Diff: 3  Page Ref: 324

31) The "fight-or-flight" response triggers the release of:
   A) ADH
   B) prolactin
   C) growth hormone
   D) epinephrine
   E) melatonin
Answer: D  Diff: 2  Page Ref: 325

32) Which one of the following is NOT an action of the catecholamines:
   A) stimulation of the sympathetic nervous system
   B) dilation of the small passages of the lungs
   C) increased heart rate
   D) decreased blood pressure
   E) increased blood glucose levels
Answer: D  Diff: 2  Page Ref: 325-326
33) Insulin is produced by cells of the pancreatic islets called:
   A) alpha cells
   B) beta cells
   C) delta cells
   D) gamma cells
   E) theta cells
   Answer: B
   Diff: 2   Page Ref: 326

34) Insulin works as an antagonist to:
   A) testosterone
   B) oxytocin
   C) thyroid hormone
   D) glucagon
   E) thymosin
   Answer: D
   Diff: 2   Page Ref: 326

35) Insulin causes:
   A) a decrease in the concentration of blood glucose
   B) an increase in the concentration of blood glucose
   C) an increase in blood pressure
   D) an increase in the production of glucagon
   E) a decrease in blood pressure
   Answer: A
   Diff: 2   Page Ref: 326

36) Which one of the following is NOT a sign of diabetes mellitus:
   A) polyuria
   B) polydipsia
   C) moon face
   D) polyphagia
   E) acidosis
   Answer: C
   Diff: 2   Page Ref: 326

37) The pineal gland produces
   A) thymosin
   B) melatonin
   C) estrogen
   D) insulin
   E) cortisol
   Answer: B
   Diff: 1   Page Ref: 329
38) The hormone that appears to help regulate our sleep-awake cycles is:
   A) thymosin
   B) melatonin
   C) progesterone
   D) glucagon
   E) thyroxine
   Answer: B
   Diff: 1 Page Ref: 329

39) The hormone responsible for the maturation of white blood cells known as T lymphocytes is:
   A) thymosin
   B) melatonin
   C) aldosterone
   D) progesterone
   E) thyroxine
   Answer: A
   Diff: 2 Page Ref: 329

40) Estrogens do all of the following EXCEPT:
   A) stimulate the development of secondary sex characteristics in females
   B) stimulate growth of facial hair
   C) stimulate menstruation
   D) help maintain pregnancy
   E) prepare the uterus to receive a fertilized egg
   Answer: B
   Diff: 3 Page Ref: 329

41) Which of these hormones does NOT play a role in reproduction:
   A) antidiuretic hormone
   B) follicle-stimulating hormone
   C) luteinizing hormone
   D) testosterone
   E) estrogen
   Answer: A
   Diff: 3 Page Ref: 316; 329

42) Which one of the following hormones is NOT produced by the anterior lobe of the pituitary gland:
   A) growth hormone
   B) prolactin
   C) oxytocin
   D) luteinizing hormone
   E) thyroid-stimulating hormone
   Answer: C
   Diff: 2 Page Ref: 314–316
43) The cells in the testes that produce testosterone are called:
   A) interstitial cells
   B) alpha cells
   C) beta cells
   D) pancreatic islet cells
   E) gonadotropic cells
Answer: A
Diff: 2 Page Ref: 316

44) The secondary sex characteristics brought about by testosterone secretion do NOT include:
   A) growth of facial hair
   B) development of heavy bones
   C) development of breasts
   D) lowering the voice
   E) development of heavy muscles
Answer: C
Diff: 1 Page Ref: 329

45) Which hormone works with estrogen to bring about the menstrual cycle:
   A) human chorionic gonadotropin
   B) progesterone
   C) testosterone
   D) prolactin
   E) oxytocin
Answer: B
Diff: 1 Page Ref: 329

True/False

1) Exocrine glands are considered ductless glands because they release their hormones into the blood or lymph.
   Answer: TRUE
   Diff: 1 Page Ref: 314

2) The endocrine system is generally faster than the nervous system in coordinating the activities of body cells.
   Answer: FALSE
   Diff: 1 Page Ref: 310

3) Most hormones are regulated by negative feedback mechanisms.
   Answer: TRUE
   Diff: 1 Page Ref: 311

4) Releasing and inhibiting hormones produced by the hypothalamus travel to the anterior pituitary through the blood of the portal circulation.
   Answer: TRUE
   Diff: 2 Page Ref: 316

5) The pituitary gland is found in the brain closely associated with the hypothalamus.
   Answer: TRUE
   Diff: 1 Page Ref: 314
6) Hypersecretion of growth hormone during childhood leads to pituitary dwarfism.
   Answer: FALSE
   Diff: 2   Page Ref: 314

7) The target issue of prolactin is the female breast.
   Answer: TRUE
   Diff: 2   Page Ref: 315

8) Neurosecretory cells transport oxytocin and antidiuretic hormone to the anterior pituitary gland for storage.
   Answer: FALSE
   Diff: 2   Page Ref: 318

9) The posterior pituitary gland stores the hormones it releases, but does not manufacture them.
   Answer: TRUE
   Diff: 1   Page Ref: 318

10) Vasopressin is another name for antidiuretic hormone.
    Answer: TRUE
    Diff: 2   Page Ref: 318-319

11) Hyposecretion of FSH or LH leads to sterility in both males and females.
    Answer: TRUE
    Diff: 3   Page Ref: 316

12) Alcohol can suppress the production of antidiuretic hormone.
    Answer: TRUE
    Diff: 2   Page Ref: 319

13) Diabetes insipidus is caused by hyposecretion of insulin.
    Answer: FALSE
    Diff: 2   Page Ref: 319

14) Thyroid hormone is actually two iodine-containing hormones called T3 and T4.
    Answer: TRUE
    Diff: 3   Page Ref: 319

15) Hyposecretion of thyroxine in children can result in cretinism.
    Answer: TRUE
    Diff: 2   Page Ref: 319

16) Myxedema is the result of hyperthyroidism.
    Answer: FALSE
    Diff: 2   Page Ref: 320

17) Parathyroid hormone is the most important regulator of blood calcium concentration.
    Answer: TRUE
    Diff: 3   Page Ref: 321
18) Calcitonin is a hormone antagonistic to parathormone in the regulation of blood calcium concentration.
   Answer: TRUE
   Diff: 1   Page Ref: 320

19) Mineralocorticoids help regulate both water and electrolyte balance in body fluids.
   Answer: TRUE
   Diff: 2   Page Ref: 322–323

20) The adrenal glands are similar to the pituitary gland in that they have both glandular and neural tissue.
   Answer: TRUE
   Diff: 1   Page Ref: 322

21) The adrenal cortex is made up of neural tissue.
   Answer: FALSE
   Diff: 2   Page Ref: 322

22) Glucocorticoids, glucagon, and epinephrine are hyperglycemic hormones.
   Answer: TRUE
   Diff: 3   Page Ref: 326

23) The glucocorticoids help the body handle long-term stress primarily by increasing blood glucose levels.
   Answer: TRUE
   Diff: 2   Page Ref: 323

24) Both male and female sex hormones are produced by the adrenal cortex throughout life in relatively small amounts.
   Answer: TRUE
   Diff: 2   Page Ref: 324

25) Hypersecretion of the sex hormones may lead to masculinization in both men and women.
   Answer: TRUE
   Diff: 2   Page Ref: 324

26) The adrenal medulla and posterior pituitary are both composed of nervous tissue.
   Answer: TRUE
   Diff: 2   Page Ref: 324

27) Adrenaline is also known as epinephrine.
   Answer: TRUE
   Diff: 1   Page Ref: 325

28) The pancreas produces both glucagon and glucocorticoids.
   Answer: FALSE
   Diff: 2   Page Ref: 323; 326

29) Melatonin production peaks during the night to help regulate the body’s day–night cycle.
   Answer: TRUE
   Diff: 2   Page Ref: 329
30) The thymus gland is located in the neck wrapped around the trachea.
   Answer: FALSE  
   Diff: 1  Page Ref: 329

31) The pancreas has both endocrine and exocrine functions.
   Answer: TRUE  
   Diff: 1  Page Ref: 329

32) The placenta is a temporary organ formed in the uterus of pregnant women.
   Answer: TRUE  
   Diff: 1  Page Ref: 332
Matching

Match the following hormones with their endocrine gland:

1) Growth hormone  
   Diff: 2  Page Ref: 314  
   - A) uterus  
   - B) corpus luteum

2) Prolactin  
   Diff: 2  Page Ref: 315  
   - C) beta cells of pancreatic islets

3) Adrenocorticotropic hormone  
   Diff: 2  Page Ref: 315  
   - D) placenta  
   - E) testes

4) Thyroid-stimulating hormone  
   Diff: 2  Page Ref: 315  
   - F) adrenal medulla  
   - G) pancreatic islets

5) Luteinizing hormone  
   Diff: 2  Page Ref: 316  
   - H) anterior pituitary

6) Oxytocin  
   Diff: 2  Page Ref: 318  
   - I) parathyroids  
   - J) posterior pituitary

7) Antidiuretic hormone  
   Diff: 2  Page Ref: 318  
   - K) alpha cells of pancreatic islets  
   - L) pineal

8) Follicle-stimulating hormone  
   Diff: 2  Page Ref: 316  
   - M) thyroid

9) Thyroxine  
   Diff: 2  Page Ref: 319  
   - N) ovaries  
   - O) adrenal cortex

10) Calcitonin  
    Diff: 2  Page Ref: 320  
    - P) thymus

11) Parathormone  
    Diff: 2  Page Ref: 321

12) Aldosterone  
    Diff: 2  Page Ref: 322

13) Cortisone  
    Diff: 2  Page Ref: 323

14) Catecholamines  
    Diff: 2  Page Ref: 325

15) Glucocorticoids  
    Diff: 2  Page Ref: 323

16) Insulin  
    Diff: 2  Page Ref: 326
17) Glucagon
   Diff: 2  Page Ref: 326

18) Melatonin
   Diff: 2  Page Ref: 329

19) Thymosin
   Diff: 2  Page Ref: 329

20) Human chorionic
gonadotropin
   Diff: 2  Page Ref: 332

1) H  2) H  3) H  4) H  5) H  6) J
19) P  20) D

Match the following actions with the appropriate hormone:

21) Stimulates milk production
   Diff: 3  Page Ref: 315
   A) antidiuretic hormone
   B) parathyroid hormone

22) Promotes water retention by the kidneys
   Diff: 3  Page Ref: 318
   C) insulin
   D) thymosin

23) Stimulates growth of bone and muscles
   Diff: 3  Page Ref: 314
   E) calcitonin
   F) oxytocin

24) Reduces blood glucose levels
   Diff: 3  Page Ref: 326
   G) growth hormone

25) Raises blood calcium levels
   Diff: 3  Page Ref: 321
   H) estrogen
   I) thyroid hormone

26) Promotes growth of uterine lining
   Diff: 3  Page Ref: 329
   J) prolactin
   K) glucocorticoids

27) Stimulates contraction of the uterus
   Diff: 3  Page Ref: 318
   L) epinephrine
   M) progesterone

28) Programs T lymphocytes
   Diff: 3  Page Ref: 329
   N) glucagon

   27) F  28) D
Essay

1) Explain the two major chemical classifications of hormones.
   Answer: The amino acid-based molecules include proteins, peptides, and amines. The steroid hormones include the sex hormones made by the gonads and the hormones produced by the adrenal cortex.
   Diff: 2 Page Ref: 310

2) Describe the three types of stimuli that activate the endocrine organs.
   Answer: The most common stimulus is hormonal. In hormonal stimulus, endocrine organs are prodded into action by other hormones, known as tropic hormones. Another type of stimulus is humoral, in which changing blood levels of certain ions and nutrients stimulate hormone release. The third type of stimulus is neural, in which nerve fibers stimulate hormone release.
   Diff: 2 Page Ref: 311-312

3) Explain the pituitary–hypothalamus relationship.
   Answer: Hormones from the anterior pituitary are released in response to releasing and inhibiting hormones produced by the hypothalamus. The hypothalamus releases these hormones into the blood of the portal circulation, which connects the blood supply of the hypothalamus with that of the anterior pituitary. Hormones from the posterior pituitary are made in the hypothalamus by hypothalamic neurons. Those hormones are then stored in the posterior pituitary until their release is necessary.
   Diff: 3 Page Ref: 316; 318

4) Explain the negative feedback interaction between calcitonin and parathormone.
   Answer: Calcitonin, released by the thyroid gland, decreases blood calcium levels by causing calcium to be deposited in the bones. Parathormone, released by the parathyroids in response to low blood calcium levels, stimulates bone destruction by osteoclasts, causing release of calcium into the blood. PTH is, therefore, a hypercalcemic hormone, whereas calcitonin is a hypocalcemic hormone. PTH is the most important regulator of calcium ion homeostasis of the blood.
   Diff: 3 Page Ref: 320-322

5) Explain the causes and effects of menopause.
   Answer: The onset of menopause, commonly called "change of life," is brought about by decline and atrophy of the ovaries. The decreased production of estrogen and other female hormones results in the inability to bear children, arteriosclerosis, osteoporosis, decreased skin elasticity, and sympathetic nervous system changes. These changes in the sympathetic nervous system bring about what are commonly called "hot flashes." Other symptoms include fatigue, nervousness, and mood changes.
   Diff: 1 Page Ref: 332
6) Four-year-old Tim is extremely small for his age, and he shows signs of mental retardation. His hair is thinning and his skin is dry. His parents have read about cretinism and pituitary dwarfism as possible diagnoses for their son and have taken him to the pediatrician for tests to be run. Which diagnosis do you think is correct? Explain why.

Answer: The likely diagnosis is cretinism. Hyposecretion of the thyroid hormone in early childhood leads to cretinism. Cretinism results in dwarfism and mental retardation. Cretinism also causes hair to be scanty and the dry skin. It is unlikely Tim suffers from pituitary dwarfism. Pituitary dwarfism results from hyposecretion of growth hormone in children but does not cause the other symptoms listed.

Diff: 3  Page Ref: 314; 319-320

7) Jamie is dehydrated from playing a rough game of football on a hot summer afternoon. Explain why beer is not a good choice of beverage considering what you know about antidiuretic hormone.

Answer: Antidiuretic hormone prevents urine production and promotes water retention by the kidneys. However, alcoholic beverages inhibit ADH secretion and result in a large output of urine. Jamie is already dehydrated and alcohol will only further that situation.

Diff: 3  Page Ref: 318-319

8) Explain how insulin and glucagon work as antagonists to one another.

Answer: Hormones that perform opposite actions are called antagonists. Insulin lowers blood glucose levels by increasing the ability of cells to transport glucose across their plasma membranes. Glucagon targets the liver to break down stored glycogen into glucose. The glucose is then released into the bloodstream to increase blood glucose levels.

Diff: 2  Page Ref: 326; 328

9) Compare the effects of hypersecretion and hyposecretion of growth hormone on a child.

Answer: Hyposecretion of growth hormone in a child leads to pituitary dwarfism. Body proportions are normal, but the person does not exceed 4 feet in height. Hypersecretion of growth hormone in a child leads to gigantism. Although body proportions are normal, the person can reach 8 to 9 feet in height.

Diff: 2  Page Ref: 314-315