I. Select the best answer (2% each)

1. Which of the following are correctly paired?

(A) tyrosine: precursor for dopamine
(B) cortisone: precursor for cortisol
(C) epinephrine: precursor for norepinephrine
(D) A and B are correct
(E) all are correct

2. Which of the following is NOT essential for normal biosynthesis of thyroid hormones?

(A) iodine
(B) ferritin
(C) thyroglobulin
(D) protein synthesis
(E) TSH

3. Full development and function of the seminiferous tubules requires

(A) somatostatin
(B) LH
(C) oxytocin
(D) FSH
(E) androgens and FSH

4. A decrease in extracellular fluid volume would be expected to cause increased secretion of

(A) vasopressin
(B) renin
(C) dehydroepiandrosteronl
(D) A, B and C are correct
(E) All are false

5. Which of the following is not involved in regulating plasma Ca^{2+} levels?

(A) the kidneys
(B) the intestine
(C) the lungs
(D) the liver
(E) the skin

6. At or immediately before the time of ovulation in humans, there is a marked increase in the plasma concentration of the following except

(A) FSH
(B) LH
(C) 17β - estradiol
(D) progesterone
(E) none of the above

7. Glucagon is not normally found in the

(A) brain
(B) pancreas
(C) adrenal glands
(D) plasma
(E) gastrointestinal tract

8. Which of the following hormones is not made up of α- and β-subunits?

(A) prolactin
(B) human chorionic gonadotropin (HCG)
(C) FSH
(D) LH
(E) TSH

9. Calcium metabolism is affected in

(A) pseudohypoparathyroidism
(B) renal failure
(C) cancer
(D) precocious puberty
(E) All above are correct.

10. Which of the following stimulate the secretion of both insulin and glucagon?

(A) glucose
(B) acetylcholine
(C) A and B are correct
(D) A and B are incorrect

11. The neurotransmitters in autonomic ganglions are recognized as

(A) histamine
(B) norepinephrine
(C) acetylcholine
(D) serotonin
(E) all of the above

12. The major cotransmitters in adrenergic neurotransmission are

(A) norepinephrine (NE) and serotonin
(B) NE and VIP
(C) acetylcholine (ACh) and VIP
(D) NE and neuropeptide Y
(E) ACh and neuropeptide Y

13. Release of acetylcholine needs

(A) calcium ions
(B) sodium ions
(C) potassium ions
(D) nerve impulse
(E) all of the above

14. Receptors responsible for cholinergic neurotransmission are

(A) M-1 type
(B) M-2 type and/or M-3 type
(C) N-1 type
(D) N-2 type
(E) all of the above

15. Responses to stress, substances increased in bloods are

(A) acetylcholine
(B) histamine
(C) dopamine
(D) VIP
(E) none of the above

16. The major neurotransmitter involved in pain reflex in spinal cord is

(A) substance P
(B) acetylcholine
(C) melatonin
(D) VIP
(E) epinephrine

17. The main reasons for the color responses are

(A) formation of melatonin
(B) formation of rods
(C) formation of ACTH
(D) formation of endorphine
(E) none of the above

18. Accommodation of distant vision is regulated by

(A) ciliary muscle
(B) lachrymal sac
(C) concentration of rhodopsin
(D) cornea size
(E) all of the above

19. The detectable sound frequencies in human ear are

(A) 10 to 5,000 Hz
(B) 15 to 50,000 Hz
(C) 16 to 20,000 Hz
(D) 26 to 20,000 Hz
(E) 50 to 50,000 Hz

20. Superficial senses are performed as

(A) touch, pressure and vibration
(B) vibration, pressure and touch
(C) pressure, touch and vibration
(D) pressure, vibration and touch
(E) none of the above

II. Describe feedback mechanisms of gastric acid secretion in the stomach and duodenum. (10%)

III. Explain the formation of renin and angiotensins, and how they regulate the blood pressure. (10%)

IV. Explain the formation of plasmin and tissue-type plasminogen activator, and how they regulate the hemostasis. (10%)

V. Give acetylcholine as an example, describe the sequence of events which occurs during synaptic transmission. (10%)

VI. γ-aminobutyric acid (GABA) is an inhibitory neurotransmitter in the mammalian central nervous system; discuss its ionic mechanism of action. (10%)

VII. Briefly describe the reabsorption of sodium in the proximal tubule of kidney. (10%)