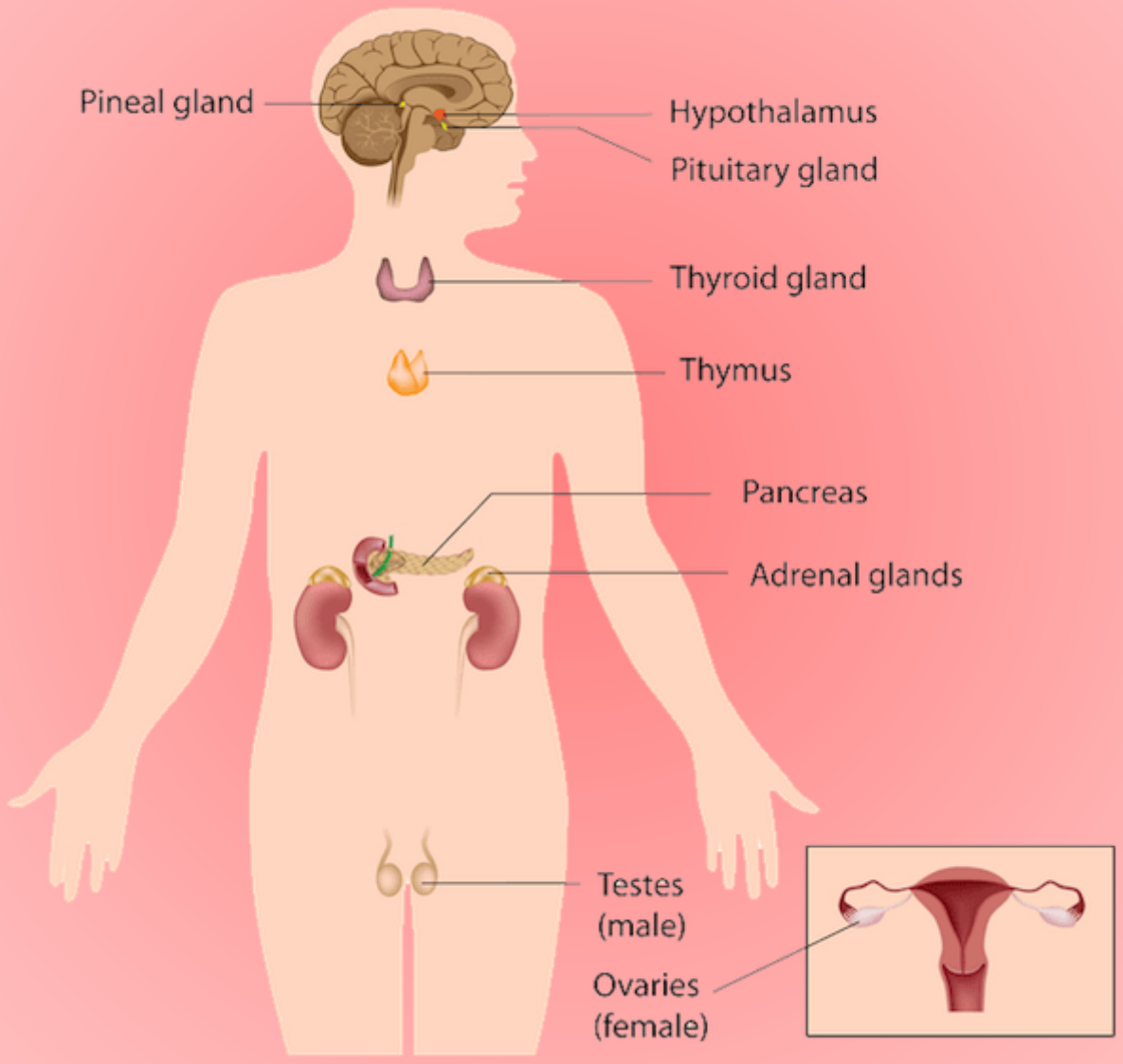
22.CHEMICAL COORDINATION AND INTEGRATION



Biology Smart Booklet

Theory + NCERT MCQs + NEET PYQs

CHEMICAL CO-ORDINATION AND INTEGRATION

ENDOCRINE SYSTEM

TYPE OF GLANDS

- Exocrine:- are ducted
- Endocrine:- Ductless glands
- Heterocrine:- Partly exocrine and partly endocrine
- Endocrine-Secrete

Hormones:-
Chemical messengers of the body.

Pineal Gland

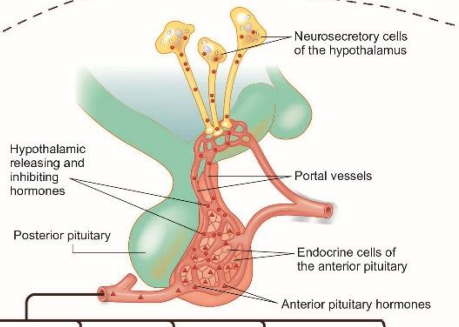
- Located on dorsal side of brain.
- Secretes melatonin or sleep hormone.
- Regulates sleep and wake cycle, pigmentation, body temperature, etc.

HYPOTHALAMUS

Releasing hormones	Inhibiting hormones	Oxytocin/ Vasopressin
• Stimulates secretion of pituitary hormones. • Eg., Gonadotrophin Releasing Hormone (GnRH) stimulates release of gonadotrophins.	• Inhibit secretion of pituitary hormones. • Eg., Somatostatin inhibits release of growth hormone from pituitary.	• Transported axonally and stored in pituitary.

PITUITARY GLANDS

- Master glands, located in a bony cavity – Sella tursica.
- Attached to the hypothalamus by a stalk.



HORMONE	FSH and LH	TSH	ACTH	Prolactin	MSH	GH
TARGET	Testes or ovaries	Thyroid	Adrenal cortex	Mammary glands	Melanocytes	Liver, bones, other tissues
	Tropic effects only			Nontropic effects only		Tropic and nontropic effects

PARATHYROID GLANDS

- Four parathyroid glands are present on back side of the thyroid glands.
- Secrete → Parathyroid hormone
  → Hypercalcemic hormone
  Stimulates bone resorption
  Maintains Calcium balance.

THYROID GLAND

Largest endocrine gland.

- Thyroxine (T_4)
- Triiodothyronine (T_3)
- Hyrocalcitonin (TCT)

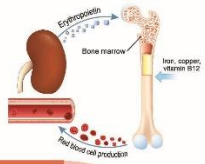
- Regulates BMR.
- Support RBC formation.
- Control metabolism of carbohydrate, protein & fats.

HORMONES SECRETED BY OTHER ORGANS OR TISSUE

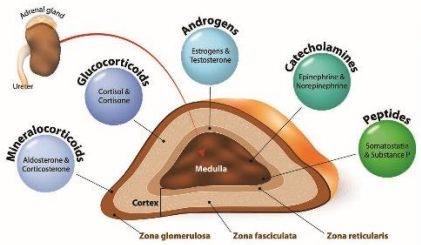
Atrial wall of heart	Juxtaglomerular cells of Kidney	Gastrin
• Atrial Natriuretic factor (ANF)	• Erythropoietin	• Cholecystokinin • Gastrin Inhibitory Peptide • Secretin • Gastrin

PANCREAS

Alpha - cells	Beta - cells
Glucagon	Insulin
• Hyperglycemic factor. • Stimulate gluconeogenesis.s • Reduce Cellular glucose uptake.	• Hypoglycemic factor. • Stimulate glycogenesis. • Stimulates glucose uptake.



ADRENAL GLAND



- **Adrenal Cortex**
  - Cortisol
  - Aldosterone
  - Androgenic Corticoids
- **Adrenal Medulla**
  - Adrenaline
  - Noradrenaline

Emergency hormones

THYMUS

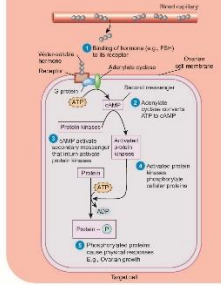
- Located behind sternum
- Secretes thymosins (peptide hormone).
- Help in differentiation of T – lymphocytes that provides cell – mediated immunity.
- Promote antibody production for humoral immunity.

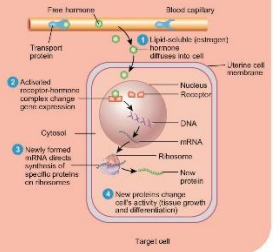
MECHANISM OF HORMONE ACTION

Hormone binds to its specific receptor to form hormone – receptor complex.

Hormone – Receptors

Membrane – bound	Intracellular





TESTIS

- Male primary sex organ
- Present in the Scrotal Sac

Hormones By Leydig Cells

Androgens (mainly testosterone)

- Regulate function of male accessory sex organs.
- Stimulates formation of spermatozoa.
- Stimulates male sexual behaviour.

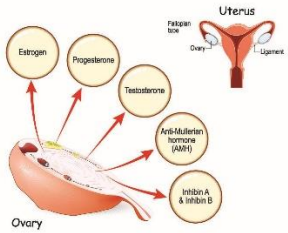
OVARIES

- Female primary sex organs
- Located in abdomen in pair

HORMONES

Estrogen	Progesterone
o Regulates growth of female sex organ. o Control female secondary sexual characters and behaviors.	o Pregnancy hormone. o Acts on mammary glands for milk secretion.

Hormones produced by the ovaries



CHEMICAL COORDINATION AND INTEGRATION

Control and coordination

In animals, control and coordination is performed by neural system and endocrine system jointly. As the nerve fibers do not innervate all cells of the body, the endocrine system is required to coordinate the functions.

Endocrine Glands

Endocrine glands are ductless glands. They release their secretion directly into blood which is then transported to specific target organs to initiate a particular metabolic change. The endocrine glands secrete chemicals called hormones. Hormones are non-nutrient chemicals which act as intercellular messengers and are produced in trace amount.

Human Endocrine System: The endocrine glands and hormone producing tissues/ cells are located in different parts of the body. Gastrointestinal tract, kidney, liver, and heart also produce small quantity of hormones to control and coordinate the function of respective organs.

Hypothalamus

Hypothalamus contains several groups of neurosecretory cells called nuclei which produce hormones. Hormones released by Hypothalamus regulate the synthesis and secretion of pituitary hormones.

Hypothalamus produces two types of Hormones:

- Releasing hormones (Gonadotrophin releasing hormones GnRH)
- Inhibiting hormones (Somatostatin)

The hormones released from hypothalamus reaches the anterior pituitary through portal circulatory system and regulate its function.

The posterior pituitary is under direct control of hypothalamus.

Pituitary Gland

Pituitary Gland is located in sella tursica, a bony cavity. It is attached to the hypothalamus by a stalk.

Pituitary Gland are divided into two parts:

- Adenohypophysis.
- Neurohypophysis/ posterior pituitary (oxytocin, vasopressin).

Adenohypophysis are divided into two parts:

- Pars distalis/ Anterior pituitary (GH, Prolactin, TSH, ACTH, LH & FSH)
- Para intermedia (Melanocyte stimulating hormone)

Pituitary gland:

- Excess secretion of Growth Hormone causes overgrowth of the body leading to gigantism and low secretion causes stunted growth called dwarfism.
- Prolactin stimulates growth of mammary gland and production of milk.
- TSH stimulates production and release of thyroid hormone.
- LH and FSH stimulate activity of the gonads. In male, LH stimulates synthesis and secretion of androgen hormone from testis. In female, LH induces ovulation of fully mature ovum from ovary.
- Oxytocin helps in contraction of uterus during childbirth and milk ejection from mammary glands.
- Vasopressin stimulates absorption of water and electrolyte in kidney.
- MSH acts on the melanocytes and regulates skin pigmentation.

The pineal Gland

The pineal Gland located on dorsal side of forebrain and release melatonin hormone that helps to regulate diurnal rhythm of body like sleeps wake cycle and body temperature.

Thyroid Gland

It is composed of two lobes on either side of trachea connected by isthmus.

Thyroid gland is made of follicles and stromal tissues:

- Iodine is essential for synthesis of thyroid hormones. Deficiency of iodine leads to hypothyroidism (Goiter). During pregnancy, hypothyroidism may cause stunted growth of baby and mental retardation.
- Thyroid hormones regulate the basal metabolic rate. They support the process of red blood cell formation. They control the metabolism of carbohydrates, proteins and fats. Thyrocalcitonin hormone regulates blood calcium levels.

Parathyroid Gland

It is located on the back side of thyroid gland, secretes peptide hormone called parathyroid hormone (PTH). PTH regulates the calcium ion concentration in the blood. It also helps in reabsorption of calcium from renal tubules and digestive tracts.

Thymus

It is located on the dorsal side of heart and the aorta. This gland releases peptide hormone thymosin's that help in differentiation of T-Lymphocytes for cell-mediated immunity. It also promotes production of antibodies to provide humeral immunity.

Adrenal Gland

It is located on anterior part of each kidney, composed of two types of tissues central adrenal medulla and outside adrenal cortex. Adrenal medulla secretes adrenaline and noradrenaline hormone commonly called as catecholamines. These hormones are also called as emergency hormone. These hormones increase alertness, pupillary dilation, sweating, heartbeat, rate of respiration, glycogenolysis.

The adrenal cortex secretes glucocorticoids and mineralocorticoids. Glucocorticoids stimulate gluconeogenesis. Mineralocorticoids regulate water and electrolyte contents of the body.

Pancreas

- They act as both endocrine and exocrine gland. Endocrine pancreas consists of "Islets of Langerhans" which contain a-cells and β-cells. The a-cells secrete hormone glucagon and β-cells secrete insulin. Both hormones are involved in maintenance of blood sugar levels.
- Glucagon is a peptide hormone that stimulates glycogenolysis resulting in increased blood sugar (hyperglycemia).
- Insulin is a peptide hormone that play major role in regulation of glucose homeostasis. It triggers rapid movement of glucose from blood to hepatocytes and adipocytes resulting in decreased blood glucose levels (hypoglycemia).

Testis

They perform dual functions as a primary sex organ as well as endocrine glands. Leydig cells or interstitial cells produce androgen mainly testosterone which regulate maturation of primary sex organs and spermatogenesis.

Ovary

Produce two groups of steroid hormones called estrogen and progesterone. Estrogen is synthesized and secreted by growing ovarian follicles. After ovulation, ruptured ovum called corpus luteum, secretes progesterone. Estrogen produces wide range actions like growth of female secondary sex organs, development of growing ovarian follicles, and regulation of female sexual behavior. Progesterone regulates pregnancy.

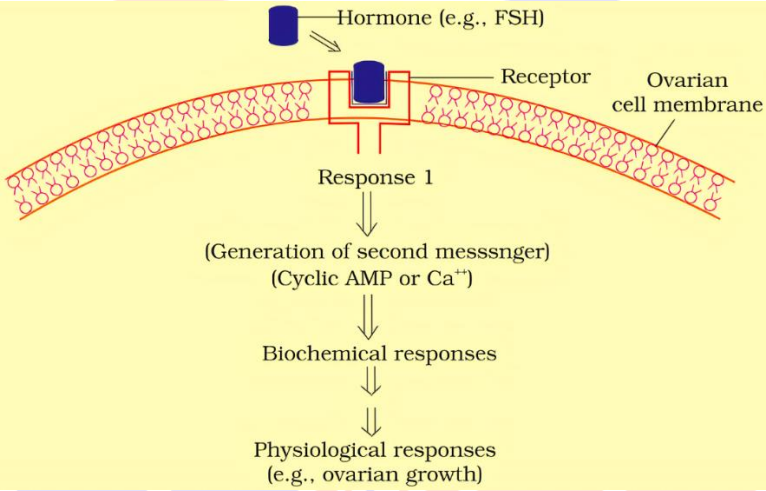
Hormones of Heart, Kidney and Gastrointestinal Tract

- Atrial wall of heart secretes peptide hormone called atrial natriuretic factor (ANF) which decreases blood pressure.
- The juxtaglomerular cells of kidney produce erythropoietin hormone which stimulate erythropoiesis.
- Gastro-intestinal tract secrete four major peptide hormones:
- Gastrin stimulates the secretion of hydrochloric acid and pepsinogen.
- Secretin acts on the exocrine pancreas and stimulates secretion of water and bicarbonate ions.
- Cholecystokinin (CCK) stimulates the secretion of pancreatic enzymes and bile juice

- Gastric inhibitory peptide (GIP) inhibits gastric secretion and motility.

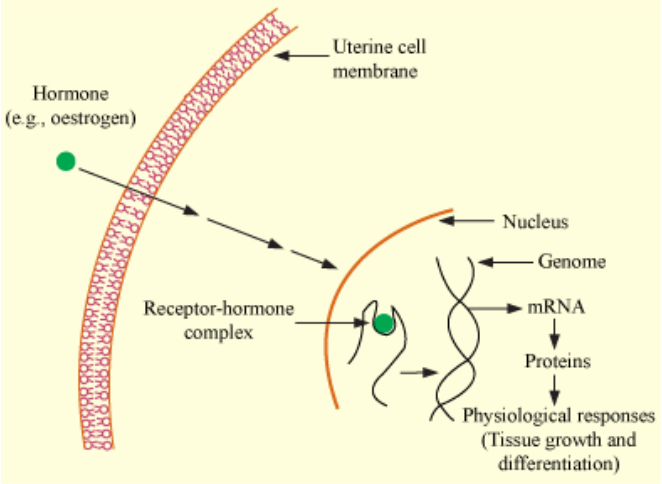
Mechanism of Hormone Action

- Hormone produce their effects on target tissues by binding to specific protein called hormone receptors located in the target tissue.
- Binding of hormones to receptor leads to the formation of hormone receptor complex. This binding leads to change in target tissue.



On the basis of chemical nature, hormones are grouped as

- Peptide, polypeptide and protein hormones- insulin, glucagon, pituitary hormone, hypothalamic hormones.
- Steroids- cortisol, testosterone, progesterone.
- Iodothyronines- thyroid hormones.
- Amino acid derivatives- epinephrine.
- The hormones that bind with membrane bound receptors normally do not enter the target cells but generate second messenger which in turn regulate cellular metabolism.
- The hormones (steroid hormones) which interact with intracellular receptors mostly regulate gene expression or chromosome function by interaction with hormone-receptor complex with the genome. These biochemical actions result in physiological and developmental effects.



NCERT LINE BY LINE QUESTIONS

HUMAN ENDOCRINE SYSTEM

1. The organ system that helps regulate the metabolic activities through secretion of hormones is
   A) cardiovascular system B) endocrine system
   C) nervous system D) digestive system
2. The nervous and endocrine systems interact to coordinate the functions of all the body systems and help to maintain
   A) homeostasis B) reflex actions
   C) fight or flight response D) stress responses
3. Responses of the endocrine system are _____ and _____ than the responses of the nervous system. **[Pg- 331,E]**
   A) rapid, long-lasting B) rapid, briefer
   C) slower, long-lasting D) slower, briefer
4. Which of the following statements correctly differentiate the endocrine and nervous systems
   A) The endocrine system regulates all types of body cells.
   B) Nerve fibers innervate all the body cell types.
   C) Endocrine system acts on specific muscle cells only.
   D) The influence of the nervous system is much broader.
5. Both neurotransmitters and hormones
   A) produce a slower response. B) bind to receptors on or in their target cells.
   C) are transported by interstitial fluid. D) produce a rapid response.
6. Consider the following statements:
   (a) Exocrine glands are the ductless glands.
   b) Sweat glands and gastric glands release their secretions directly into the blood.
   Select the correct option.
   A) Both (a) and (b) are true. B) (a) is true but (b) is false.
   C) Both (a) and (b) are false. D) (a) is false but (b) is true.
7. Which of the following gland types is correctly matched with its examples?
   A) Adrenal gland: exocrine gland B) Placenta: exocrine gland
   C) Pancreas: endocrine gland only D) Thyroid : endocrine gland
8. Which of the following statements about hormones is/are correct?
   I. Hormones are non-nutrient chemicals
   II. Hormones act as intercellular messengers
   II. Hormones are produced in trace amount
   IV. Hormones may be proteins, steroids, glycoproteins and bigenic mines
   A) All B) I, II, III C) IV D) I, III

ENDOCRINE GLAND

9. Assertion: The nervous system produces a delayed response that lasts for a longer period.
   Reason: Neurotransmitters are released from postsynaptic neurons.
   A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
   B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
   C) Assertion is true, but Reason is false.
   D) Assertion is false, but Reason is true.
10. Which of the following statements is false?

A) Hormones provide chemical coordination, integration and regulation in the human body
B) Hormones regulate metabolism, growth and development of our organs
C) Besides hypothalamus, pituitary, pineal, thyroid, adrenal, parathyroid, thymus, etc., GIT, heart, kidney, etc also produce hormones.
D) Hormone can be used again and again like biocatalyst

11. The small part of the brain that is present below the thalamus and serves as the main link between the nervous and endocrine system is
A) pons B) hypothalamus C) brain stem D) medulla oblongata

12. Consider the following events:
(A) Production of regulatory hormones from neurosecretory cells.
(B) Hormones are secreted into the portal system.
(C) Hormones move down the axons to axon endings.
Arrange them in sequential order and select the correct option.
A) A, B, C B) A, C, B C) B, C, A D) C, A, B

13. The hormones produced by hypothalamic nuclei
A) regulate the functions of the anterior pituitary.
B) regulate the functions of the posterior pituitary.
C) regulate the functions of both anterior and posterior pituitary.
D) inhibit the secretion of posterior pituitary hormones.

14. Which of the following statements about hypothalamic hormones is incorrect?
A) Hypothalamic releasing hormones stimulate the secretion of anterior pituitary hormones.
B) Hypothalamic releasing hormones stimulate the secretion of posterior pituitary hormones.
C) Hypothalamic inhibiting hormones inhibit the secretion of anterior pituitary hormones.
D) Somatostatin is a hypothalamic inhibitory hormone.

15. GnRH, a hypothalamic hormone, needed in reproduction, acts on
A) the posterior pituitary gland and stimulates secretion of LH and relaxin.
B) the anterior pituitary gland and stimulates secretion of LH and oxytocin.
C) the anterior pituitary gland and stimulates secretion of LH and FSH.
D) the posterior pituitary gland and stimulates secretion of oxytocin and

16. Which of the following hypothalamic hormones is incorrectly matched with its function
A) TRH: Stimulates secretion of thyrotropin
B) PIH: suppresses the secretion of prolactin
C) GH-RH: stimulates secretion of growth hormone
D) CRH: stimulates the release of prolactin

17. How many of the following are correct?
(i) Somatostatin is released from hypothalamus.
(ii) Hypothalamic hormones reach the pituitary gland through hypophyseal-hypoportal system.
(iii) Anterior pituitary is under direct neural regulation of hypothalamus.
A) 1 B) 2 C) 3 D) None of these

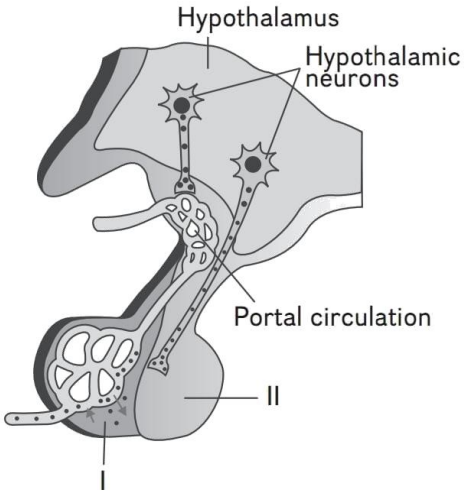
18. Portal blood vessels connect the _____ to the ____
A) Hypothalamus, brain B) Hypothalamus, posterior pituitary
C) hypothalamus, anterior pituitary D) Anterior pituitary, posterior pituitary

PITUTIARY GLAND

19. The pituitary gland is a pea-shaped gland that lies in the hypophyseal fossa of
A) sella turcica of the glenoid bone B) sella turcica of the sphenoid bone
C) sella turcica of the parietal bone D) sella turcica of the frontal bone

20. The pituitary gland is connected to the hypothalamus by
A) infundibulum B) bony cavity
C) hyaline cartilage D) elastic cartilage

21. Following is the diagrammatic representation of the pituitary gland and its connection with the hypothalamus.



Select the correct option regarding the same.
A) I: Anterior pituitary that is composed of neural tissues.
B) I: Anterior pituitary that is composed of epithelial tissues.
C) II: Posterior pituitary that is composed of epithelial tissues.
D) II: Posterior pituitary that is composed of connective tissues.

22. In adults, adenohypophysis accounts for 75% of the total weight of the gland and consists of
A) pars distalis B) pars tuberalis and pars intermedia
C) pars nervosa D) pars intermedia

23. Which of the following hormone is secreted by pars intermedia?
A) Prolactin B) Thyroid-stimulating hormone
C) Adrenocorticotrophic hormone D) Melanocyte stimulating hormone

24. Which of the following statement is incorrect about the posterior pituitary?
A) The posterior pituitary lobe is not a true endocrine gland.
B) It serves as a hormone storage region.
C) The posterior pituitary lobe and infundibulum together make neurohypophysis.
D) Oxytocin and vasopressin hormones are synthesized in the posterior pituitary lobe.

25. Malfunctioning of endocrine gland deviates the body from homeostasis and causes several disorders. Which of the following disorder is correctly matched with its respective endocrine gland?
A) Gigantism: Hyposecretion of growth hormone
B) Dwarfism: Hypersecretion of growth hormone
C) Acromegaly: Hypersecretion of growth hormone
D) Gigantism: Hypersecretion of somatostatin

26. Hypersecretion of growth hormone in adults does not cause a further increase in height, because
A) muscle fibers do not grow in size after birth.
B) growth hormone becomes inactive in adults.
C) epiphyseal plates close after adolescence.
D) bones lose their sensitivity to growth hormone in adults.

27. A person is diagnosed with hypersecretion of growth hormone due to a pituitary tumor. Select the incorrect statement about his medical condition.
A) Hypersecretion of growth hormone would cause hyperglycemia.

B) There will be a reduced secretion of insulin.
C) Insulin secretion would remain unaffected.
D) Hypersecretion of growth hormone results in a diabetogenic effect.

28. Hypersecretion of prolactin hormone in females causes inappropriate lactation and absence of menstrual cycle. Based on the given information, select the pair of correct statements.
(A) Prolactin is required for milk ejection from mammary glands.
(B) The blood level of prolactin is increased just before menstruation.
(C) During pregnancy, prolactin inhibiting hormone suppresses the release of prolactin.
(D) Sucking action of newborn inhibits the release of PIH.
A) A and B B) B and C C) A and C D) B and D

29. Select the option that correctly matches the hormone with its source endocrine gland and respective function/target organs.

Hormone	Endocrine gland	Function/target organ
(A) TSH	Anterior pituitary	All body cells
(B) ACTH	Posterior pituitary	Stimulates secretion of glucocorticoids from the adrenal cortex
(C) LH	Anterior pituitary	Triggers secretion of androgens in males
(D) FSH	Posterior pituitary	Stimulates the growth of ovaria follicles

30. Which of the following set of hormones are called gonadotropins?
A) GH and LH B) LH and FSH
C) LH and ACTH D) FSH and TSH

31. The target cells/structures of FSH and LH in human males are
A) interstitial cells and sertoli cells respectively.
B) sertoli cells and interstitial cells respectively.
C) interstitial cells only.
D) sertoli cells only.

32. LH is required for fertility in females because
A) it maintains corpus luteum.
B) it induces ovulation.
C) it stimulates the release of FSH from corpus luteum.
D) both (a) and (b).

33. Which of the following hormone is incorrectly matched with its target organ/cells?
A) MSH: melanocytes
B) Oxytocin: Smooth muscles
C) Vasopressin: distal tubules of kidneys
D) ADH: Glomerulus

34. Diuresis refers to
A) loss of water through urine
B) reduced loss of water through urine
C) process of urine formation in nephrons
D) contraction of muscles of the urinary bladder

35. Diabetes insipidus is caused by
A) hyposecretion of insulin by the pancreas
B) hyposecretion of ADH by the posterior pituitary

C) increased sensitivity of kidneys for ADH
D) hypersecretion of ADH by the posterior pituitary

36. Assertion: TSH stimulates the thyroid gland to secrete thyroid hormones.
Reason: The hormones of anterior pituitary that regulate the secretions of other endocrine glands are called tropic hormones.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.

37. Assertion: Hyposecretion of growth hormone causes stunted growth in infants.
Reason: Epiphyseal plates are closed after the childbirth.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.

38. Assertion: Hypersecretion of GH during childhood causes acromegaly.
Reason: The growth hormone regulates the fluid-electrolyte balance of the body.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.

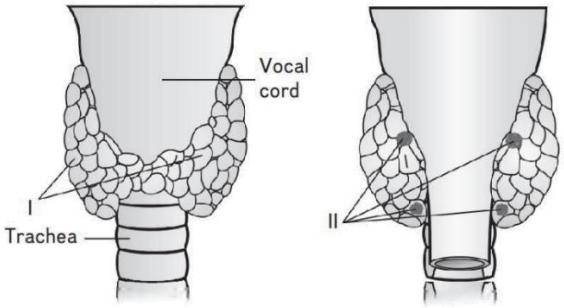
39. Assertion: ADH secretion is stimulated under the conditions of dehydration.
Reason: ADH prevents water loss from the body by decreasing the urine volume.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.

PINEAL GLAND

40. Which of the following set of functions is not regulated by the hormone of the pineal gland?
A) Diurnal rhythm and body temperature
B) Metabolism and pigmentation
C) Growth of bones and defense capability
D) Diurnal rhythm and defense capability

41. Which of the following hormone exhibits an anti-gonadotropic effect in humans?
A) ADH B) Thyroxin C) Melatonin D) ACTH

42. Following is the diagrammatic view of the position of endocrine glands.



Select the option that correctly labels the glands and their respective hormones.
A) I - Thyroid gland - Thyroxine and TSH
B) II - Parathyroid gland - PTH

C) II - Thyroid gland - Thyroxine and calcitonin
D) I - Parathyroid gland - PTH and calcitonin

43. The thyroid gland is composed of
A) stromal tissues only
B) follicles only
C) stromal tissues and follicles
D) isthmus

44. Most of the T4 is converted into T3 in the target tissues because
A) T4 is more active.
B) T3 is more active.
C) T4 has a shorter half-life.
D) follicular cells cannot synthesize T3.

45. Thyroid hormones are required for normal growth and development of humans because
A) thyroid hormones increase the basal metabolic rate in most body tissues.
B) thyroid hormones are regulated by negative feedback systems.
C) thyroid hormones contain iodine atoms.
D) thyroid hormones stimulate glycogen formation.

46. A group of tadpoles with no thyroxin hormone production exhibited disrupted metamorphosis. Which of the following statement correctly describes the role of thyroid hormones in metamorphosis.
A) Thyroid hormones lower the blood calcium levels.
B) Thyroid hormones increase blood calcium levels.
C) Thyroid hormones lower the blood phosphate levels.
D) Thyroxin stimulates protein synthesis.

47. Which of the following disorders of the endocrine system is incorrectly matched with its description?
A) Hypothyroidism: Iodine deficiency
B) Goitre: Enlarged thyroid gland
C) Hyperthyroidism: Cretinism
D) Exopthalmic goitre: Hyperthyroidism

48. Which of the given statement correctly differentiates Myxedema from Graves' disease?
A) Hypothyroidism in adult ages causes Graves' disease.
B) Graves' disease is more common among males than females.
C) Myxedema causes swelling in facial tissues due to the accumulation of interstitial fluid.
D) Myxedema is an auto-immune disorder.

49. Graves' disease is caused due to
A) hyposecretion of the thyroid gland
B) hypersecretion of the thyroid gland
C) hyposecretion of the adrenal gland
D) hypersecretion of the adrenal gland

50. Assertion: Thyroid hormones regulate oxygen consumption and basal metabolic rate of the body cells.
Reason: Thyroid hormones reduce the number of active mitochondria in body cells.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.

PARATHYROID GLAND

51. The physiological role of parathyroid gland does not include
A) increased activity of osteoclasts
B) bone resorption
C) reduced loss of Ca^{2+} and Mg^{2+} ions into urine
D) reduced loss of HPO_4^{2-} into the urine

52. Which of the following hormones can play a significant role in osteoporosis?
A) Aldosterone and Prolactin

B) Progesterone and Aldosterone
C) Estrogen and Parathyroid hormone
D) Parathyroid hormone and Prolactin

53. Which of the following pairs of hormones have antagonistic effects?
A) T3 and T4 B) ACTH and glucocorticoids
C) PTH and TCT (thyrocalcitonin) D) T3 and TSH

54. Assertion: Calcitonin and PTH exhibit an antagonistic effect on blood levels of calcium ions. Reason: Insulin and glucagon exhibit antagonistic effects on the blood levels of glucose.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.

THYMUS GLAND

55. The endocrine gland that functions as a component of the lymphatic system is
A) thyroid gland B) thymus gland
C) parathyroid gland D) pineal gland

56. Which of the following endocrine gland is responsible for reduced immune responses in old ages?
A) Thyroid gland B) Pineal gland
C) Thymus gland D) Pituitary gland

ADRENAL GLAND

57. Adrenal cortex and adrenal medulla differ from each other in terms of
A) histology B) function C) origin D) all of these

58. The endocrine gland present at the top of kidneys and involved in the fluid electrolyte balance of the body is
A) adrenal gland B) pineal gland
C) parathyroid gland D) pancreas

59. Which of the following categories of hormones is correctly matched with its examples?
A) Catecholamines: adrenaline and noradrenaline
B) Emergency hormones: adrenaline and insulin
C) Glucocorticoids: aldosterone
D) Mineralocorticoids: cortisol

60. Consider the following statements:
(a) Some chemicals act as both neurotransmitters and hormones.
(b) Norepinephrine is released as a neurotransmitter by sympathetic division.
(c) Norepinephrine is released as a hormone by the thyroid gland.
(d) Norepinephrine is released as a hormone by the parathyroid gland.
Which of the two statements are correct?
A) a and b B) a and c C) b and c D) c and d

61. Secretion of hormones from adrenal medulla is controlled by
A) parasympathetic nervous system B) pituitary gland
C) sympathetic nervous system D) peripheral nervous system

62. The fight or flight response generated by the release of hormones by adrenal medulla includes
A) dilation of pupils and increased heart rate and blood pressure.
B) glycogenolysis and lipid synthesis.
C) increased muscular movement of the gastrointestinal tract.
D) reduced blood glucose levels.

63. Which of the following hormones of the adrenal cortex are correctly matched with their source?
A) Mineralocorticoids - Zona fasciculata cells
B) Glucocorticoids - Zona glomerulosa cells
C) Androgens - Zona glomerulosa cells
D) Glucocorticoids - Zona fasciculata cells

64. Glucocorticoids are involved in
A) fluid electrolyte balance
B) carbohydrate metabolism
C) water reabsorption from kidneys
D) regulation of blood glucose levels

65. Which of the following sets of physiological functions correctly describes the role of cortisol in the human body?
A) Anti-inflammatory response and suppression of the immune response
B) Breakdown of RBCs in spleen
C) Upregulation of uptake of amino acids
D) Reabsorption of Na+ from kidneys

66. Target organ/structure of aldosterone is
A) renal calyces
B) renal tubules
C) glomerulus
D) Bowman's capsule

67. Assertion: Adrenal medullary hormones regulate the fluid-electrolyte balance of the body.
Reason: Aldosterone is a glucocorticoid that raises blood sodium levels.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false
D) Assertion is false, but Reason is true.

PANCREAS

68. Which of the following pairs of endocrine glands are composite glands?
A) Pancreas and thymus gland
B) Adrenal glands and thymus gland
C) Pancreas and adrenal gland
D) Adrenal gland and pineal gland

69. The cells that make about 70% of the cells of the pancreatic islets serve to secrete
A) insulin
B) glucagon
C) somatostatin
D) pancreatic polypeptide

70. Alpha and delta cells of pancreatic islands are the source of
A) glucagon and insulin respectively
B) somatostatin and glucagon respectively
C) glucagon and somatostatin respectively
D) insulin and glucagon respectively

71. Which of the following hormones is correctly matched with its description/effects?
A) Hyperglycemic hormone: Glucagon
B) Hypoglycemia: Glucagon
C) Hypercalcemic hormone: Calcitonin
D) Addison's disease: Catecholamines.

72. Which of the given statements correctly differentiates glycogenolysis from glycogenesis?
A) Glycogenolysis is the formation of glycogen from glucose and is triggered by glucagon.
B) Glycogenolysis is a breakdown of glycogen into glucose and is triggered by insulin.
C) Glycogenesis is the conversion of glucose into glycogen and is stimulated by insulin.
D) Glycogenesis is the formation of glucose from non-carbohydrate substrates.

73. Diabetes mellitus is a disorder of carbohydrate metabolism and is characterised by
A) polyuria
B) polydipsia
C) polyphagia
D) all of these

74. The water-soluble fuels that are normally exported by the liver but overproduced during fasting or diabetes mellitus when not treated are known as
A) fatty acids B) glucose
C) ketone bodies D) amino acids

75. Match the following hormones with the respective disease.

Column-I	**Column-II**
(a) Insulin	(1) Addison's disease
(b) Thyroxin	(2) Diabetes Insipidus
(c) Corticoids	(3) Acromegaly
(d) Growth hormone	(4) Goitre
	(5) Diabetes mellitus

Select the correct option.

	(a)	**(b)**	**(c)**	**(d)**
(A)	5	1	2	3
(B)	2	4	3	1
(C)	5	4	1	3
(D)	2	4	1	3

76. The _____ are the oval glands present in the scrotum and serve to secrete the hormones.
A) ovaries and androgen B) testes and testosterone
C) pineal gland and melatonin D) adrenal gland and cortisol

77. Which of the following is not a function of testes?
A) Spermatogenesis B) Sperm production
C) Testosterone secretion D) All of these

78. Which of the following structures/cells of testes is incorrectly matched with its functions?
A) Seminiferous tubules - Spermatogenesis
B) Sustentacular cells - Secretion of FSH
C) Interstitial cells - Secretion of testosterone
D) Sertoli cells - Nourishment of developing spermatogenic cells

79. Testes serve as an endocrine gland. Which of the given statement about testicular hormones is correct?
A) LH from the posterior pituitary stimulates interstitial cells to secrete testosterone.
B) Testosterone suppresses the secretion of LH and GnRH by the positive feedback mechanism.
C) FSH and testosterone stimulate the sustentacular cells to stimulate the secretion of the androgen-binding protein.
D) Testosterone stimulates the process of spermiogenesis.

80. The function of inhibin hormone is to
A) inhibit the FSH secretion B) inhibit the testosterone secretion
C) inhibit spermiogenesis D) stimulate spermatogenesis

81. Which of the given sets of organs represent the male accessory sex organs?
A) Epididymis and testes B) Vas deferens and testes
C) Seminal vesicles and prostate gland D) Urethra and oviduct

82. The hormone responsible for the descent of testes into the scrotum is
A) FSH B) LH C) testosterone D) inhibin

83. The function of testosterone in human males is/are
A) development of male secondary sexual characters
B) male sexual behaviour
C) stimulation of protein breakdown

D) both (A) and (B)

84. Assertion: In human males, LH is required for sperm production.
Reason: FSH and testosterone stimulate interstitial cells to secrete androgen binding protein.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.

OVARY

85. Androgens are responsible for libido in both human males and females. The source of androgens in human females is
A) ovaries B) oviducts C) corpus luteum D) adrenal cortex

86. Which of the following set of hormones is known as female sex hormones?
A) FSH and LH
B) Estrogen and progesterone
C) FSH and estrogen
D) LH and estrogen

87. Match the following structures in Column-I with the correct description in Column-II.

Column-I	**Column-II**
(a) Ovarian follicles	(1) progesterone
(b) Corpus luteum	(2) LH
(c) Graafian follicle	(3) prolactin
(d) Mammary glands	(4) estrogen

Select the correct option.

	(a)	**(b)**	**(c)**	**(d)**
(A)	4	3	2	1
(B)	4	1	2	3
(C)	3	4	2	1
(D)	3	1	4	2

88. A temporary endocrine gland in the human body is
A) pineal gland
B) corpus cardiacum
C) corpus luteum
D) corpus allatum

89. Which of thefollowing statement is incorrect about the effects and regulation of female sex hormones?
A) Ovarian and uterine cycles are under the regulation of Gonadotropinreleasing hormone.
B) In females, FSH triggers the development of follicles.
C) Ovarian follicles secrete estrogen under influence of FSH and LH.
D) Estrogen from ovarian follicles is converted into progesterone.

90. Which of the following hormones regulates the formation of corpus luteumand stimulates it to release hormones?
A) FSH B) LH C) Estrogen D) Androgens

91. Which of the following hormones is secreted by corpus luteum?
A) Estrogens
B) Progesterone
C) Relaxin
D) LH

92. Which of the following statements is incorrect?
A) Testis and ovary function as a primary sex organ as well as endocrine gland
B) Ovaries are located in thoracic cavity of females
C) Ovary produces ovum, 2 groups of steroid hormones (estrogen and progesterone)

D) Ovary is composed of ovarian follicles and stromal tissue

93. Which of the following hormone is synergistic to human growth hormone?
A) Estrogen B) Progesterone
C) Inhibin D) Androgen binding protein

94. After ovulation, the ruptured follicle is converted into-
A) Graafian follicle B) Corpus callosum
C) FSH D) LH

95. The hormone responsible to prepare and maintain endometrium for implantation of a fertilized ovum is:
A) FSH B) LH C) Progesterone D) Inhibin

96. Assertion: Corpus luteum is a temporary endocrine gland.
Reason: Corpus luteum secretes female sex hormones. **[Pg- 338,E]**
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.

HORMONES OF HEART, KIDNEY AND GASTROINTESTINAL TRACT

97. Atrial natriuretic hormone I factor (ANF) secreted by atrial wall of our heart has exactly the opposite function of this hormone secreted by zona glomerulosa –
A) ADH B) Aldosterone C) Androgen D) Calcitonin

98. Match the hormones in Column-I with their functions in Column-II.

Column-I	**Column-II**
a) Progesterone	(1) Inhibits uterine contraction
(b) Atrial natriuretic factor	(2) Formation of RBCs
(c) Erythropoietin	(3) Formation of alveoli in mammary glands
(d) Relaxin	(4) Lowers blood pressure

Select the correct option.

	(a)	**(b)**	**(c)**	**(d)**
(A)	4	3	2	1
(B)	4	1	2	3
(C)	3	4	2	1
(D)	2	1	4	3

99. ANF-
A) Decrease B.P. B) Causes vasodilation
C) Is secreted when B.P. increases D) All

100. Gastrin, secretin, cholecystokinin (CCK) and gastric inhibitory peptide (GIP) are 4 major peptide hormone secreted by-
A) Only stomach B) Only small intestine
C) Gastro-intestinal tract D) Only pancreas

101. Which of the following hormones of the gastrointestinal tract is wrongly matched with its function?

Column-I	**Column-II**
(a) Gastrin	(1) Inhibition of gastric secretions
(b) Gastric inhibitory peptide (GIP)	(2) Stimulates secretion of pancreatic juice and bile juice
(c) Secretin	(3) Secretion of gastric juice
(d) Cholecystokinin	(4) Stimulates secretion of pancreatic juice

Select the correct option.

	(a)	(b)	(c)	(d)
(A)	3	1	4	2
(B)	2	1	4	3
(C)	3	4	2	1
(D)	2	3	4	1

102. Identify the hormone with its correct matching of source and function.
A) Oxytocin - posterior pituitary, growth, and maintenance of mammary glands
B) Melatonin - pineal gland, regulates the normal rhythm of the sleep-wake cycle.
C) Progesterone - corpus luteum, stimulation of growth and activities of female secondary sex organs.
D) Atrial natriuretic factor – ventricular wall, increases the blood pressure.

103. Assertion: Hormones are also secreted by tissues that are not the endocrine glands.
Reason: Kidneys secrete the hormone atrial natriuretic factor.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.

104. Assertion: Duodenum serves endocrine function and secretes secretin hormone.
Reason: Gastrin hormone from the mucosa of the stomach stimulates the secretion of gastric glands.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.

MECHANISM OF HORMONE ACTION

105. Match the Column I with Column II.

Column I	**Column II**
A. Peptide, polypeptide protein hormones	I. Epinephrine, nor-epinephrine
B. Steroid	II. T3 and T4 (thyroid hormones)
C. Iodothyronines	III. Cortisol, testosterone, estradiol, progesterone
D. Amino acid derivatives	IV. Pituitary hormones, pancreatic hormones, hypothalamic hormones

A) A-I , B - II, C - III , D - IV
B) A- IV, B - III, C - II , D - I
C) A- IV, B – III , C - I, D - II
D) A- I, B - II, C - IV, D - III

106. Steroid hormones initiate the production of target cell substances in which manner?
A) They initiate second messenger activity
B) They bind with membrane protein
C) They initiate DNA transcription
D) They activate enzyme pathways

107. Why do some hormones (first messenger) need to trigger a "second messenger" to activate a target cell?
A) The first messenger needs activation of ATP
B) The first messenger cannot cross a plasma membrane
C) There are no specific cell surface receptors for first messenger
D) The first messenger is not a water- soluble molecule

108. Which of the following category of hormones is incorrectly matched with its examples?
A) Protein hormone: Insulin
B) Steroids: Cortisol
C) Iodothyronines: Thyroid hormones
D) Amino-acid derivatives: Oxytocin

109. Which of the following categories of the hormones is water-insoluble?
A) Eicosanoids
B) Peptide hormones
C) Amines
D) Steroid hormones

110. Which of the given hormones is/are second messengers?
A) cAMP B) IP_3 C) Ca D) All

111. Which of the following hormones does +2 not act by a second messenger system?
A) Glucagon B) Epinephrine
C) FSH D) Testosterone

112. Which of the given sets of endocrine gland secrete/ release only water-soluble hormones?
A) Pancreas and thyroid gland B) Parathyroid gland and pineal gland
C) Adrenal gland and thyroid gland D) Parathyroid gland and pancreas

113. Epinephrine is _____ derivative
A) amino acid B) carbohydrate
C) steroid D) nucleic acid

114. Which of the given hormones is incorrectly matched with its source amino acid?
A) Serotonin: Tryptophan B) Histamine: Histidine
C) Epinephrine: Tyrosine D) Melatonin: Alanine

115. The amino acid tryptophan is the precursor for the synthesis of
A) estrogen and progesterone B) cortisol and cortisone
C) melatonin and serotonin D) thyroxin and triiodothyronine

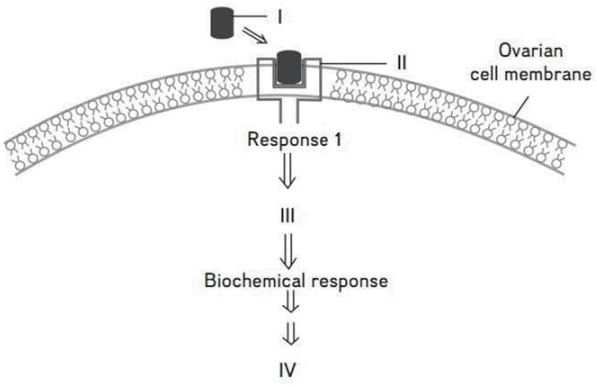
116. Which of the following statement correctly differentiate the transport of water-soluble and lipid soluble hormones in blood?
A) Most of the lipid-soluble hormones are bound to transport proteins.
B) Most of the water-soluble hormones are bound to transport proteins.
C) Transport proteins enhance the rate of hormone loss in urine
D) Transport proteins are synthesized in muscles.

117. Receptors for protein hormones are mostly present at/in
A) nucleus B) nuclear envelop C) cell surface D) cytoplasm

118. Which of the given statement is correct about the mechanism of water soluble hormones
A) Hormones bind to their cytoplasmic receptors present in the target cells.
B) The hormone-receptor complex alters the gene expression.
C) Hormones serve as the first messenger and cause the production of a second messenger.
D) The newly formed proteins produce a physiological response.

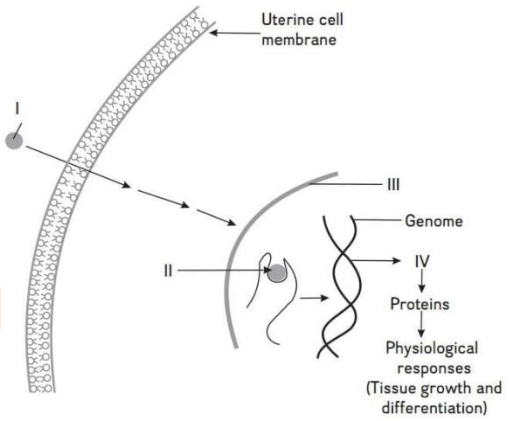
119. Which of the following molecules serve as the second messenger in the mechanism of action of a protein hormone?
A) T3 B) cAMP C) T4 D) protein kinases

120. Following is the diagrammatic representation of the mechanism of action of a protein hormone. Which of the given options correctly describes the labeled events?



A) I-hormone receptor B) II-hormone
C) III-second messenger D) IV-physiological response

121. Following is the diagrammatic representation of the mechanism of action of a steroid hormone. Which of the given options correctly describes the labeled events?



A) I-Hormone, II-second messenger B) I-Hormone, III-nucleus
C) II-Hormone-receptor complex, IV- DNA D) II-Second messenger, IV-Mrna

122. Assertion: Aldosterone can diffuse freely through the lipid bilayer.
Reason: Steroid hormones are lipidsoluble.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.

123. Assertion: Receptors for steroid hormones are present at the cell surface.
Reason: Receptors for protein hormones are present in the nucleus.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.

124. Assertion: cAMP serves as the second messenger for protein hormones.
Reason: Insulin is a protein hormone.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true

NEET PREVIOUS YEARS QUESTIONS

1. Which of the following hormones can play a significant role in osteoporosis? **[2018]**
(a) Aldosterone and prolactin (b) Progesterone and aldosterone
(c) Parathyroid hormone and prolactin (d) Estrogen and parathyroid hormone

2. Which of the following structures or regions is **incorrectly** paired with its functions? **[2018]**
(a) Medulla oblongata : Controls respiration and cardiovascular reflexes.
(b) Limbic system : Consists of fibre tracts that interconnect different regions of brain; controls movement.
(c) Corpus callosum : Band of fibres connecting left and right cerebral hemispheres.
(d) Hypothalamus : Production of releasing hormones and regulation of temperature, hunger and thirst.

3. Which of the following is an amino acid derived hormone? **[2018]**
(a) Epinephrine (b) Ecdysone (c) Oestriol (d) Oestradiol

4. A temporary endocrine gland in the human body is: **[2017]**
(a) Corpus cardiacum (b) Corpus luteum (c) Corpus allatum (d) Pineal gland

5. GnRH, a hypothalamic hormone, needed in reproduction, acts on **[2017]**
(a) anterior pituitary gland and stimulates secretion of LH and FSH.
(b) posterior pituitary gland and stimulates secretion of oxytocin and FSH
(c) posterior pituitary gland and stimulates secretion of LH and relaxin.
(d) anterior pituitary gland and stimulates secretion of LH and oxytocin.

6. Hypersecretion of growth hormone in adults does not cause further increase in height, because **[2017]**
(a) epiphyseal plates close after adolescence. (b) bones loose their sensitivity to growth hormone in adults.
(c) muscle fibres do not grow in size after birth. (d) growth hormone becomes inactive in adults.

7. Which of the following pairs of hormones are not antagonistic (having opposite effects) to each other? **[2016]**
(a) Parathormone – Calcitonin (b) Insulin – Glucagon
(c) Aldosterone – Atrial Natriuretic Factor (d) Relaxin – Inhibin

8. Changes in GnRH pulse frequency in females is controlled by circulating levels of : **[2016]**
(a) Estrogen and progesterone (b) Estrogen and inhibin
(c) Progesterone only (d) Progesterone and inhibin

9. Identify the **correct** statement regarding 'inhibin'. **[2016]**
(a) It inhibits the secretion of LH, FSH and prolactin.
(b) It is produced by granulosa cells in ovary and inhibits the secretion of FSH.
(c) It is produced by granulosa cells in ovary and inhibits the secretion of LH
(d) It is produced by nurse cells in testes and inhibits the secretion of LH.

10. Which one of the following hormones is not involved in sugar metabolism? **[2015]**
(a) Aldosterone (b) Insulin (c) Glucagon (d) Cortisone

11. Which one of the following hormone though synthesised elsewhere is stored and released by the master gland? **[2015]**
(a) Luteinising hormone (b) Prolactin
(c) Melanocyte stimulating hormone (d) Antidiuretic hormone

12. A chemical signal that has both endocrine and neural roles is **[2015]**
(a) calcitonin (b) epinephrine (c) cortisol (d) melatonin

13. Identify the hormone with its **correct** matching of source and function. **[2014]**
(a) Oxytocin - posterior pituitary, growth and maintenance of mammary glands.
(b) Melatonin - pineal gland, regulates the normal rhythm of sleepwake cycle.
(c) Progesterone - corpus-luteum, stimulation of growth and activities of female secondary sex organs.
(d) Atrial natriuretic factor - ventricular wall, increases the blood pressure.

14. Fight-or-flight reactions cause activation of **[2014]**
(a) the parathyroid glands, leading to increased metabolic rate.
(b) the kidney, leading to suppression of renin angiotensin–aldosterone pathway.
(c) the adrenal medulla, leading to increased secretion of epinephrine and nor-epinephrene.
(d) the pancreas, leading to a reduction in the blood sugar levels.

15. Which of the following factors is responsible for the formation of concentrated urine? **[NEET-2019]**
(1) Low levels of antidiuretic hormone.
(2) Maintaining hyperosmolarity towards inner medullary interstitium in the kidneys.
(3) Secretion of erythropoietin by juxtaglomerular complex.
(4) Hydrostatic pressure during glomerular filtration.

16. Match the following hormones with the respective disease : **[NEET-2019]**

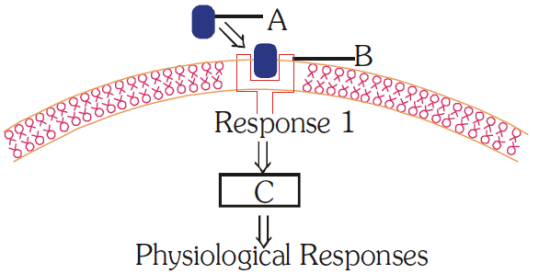
(a) Insulin	(i) Addison's disease
(b) Thyroxin	(ii) Diabetes insipidus
(c) Corticoids	(iii) Arcomegaly
(d) Growth Hormone	(iv) Goitre
	(v) Diabetes mellitus

Select the correct option.
(a) (b) (c) (d) (a) (b) (c) (d) (a) (b) (c) (d) (a) (b) (c) (d)

(1) (v) (i) (ii) (iii) (2) (ii) (iv) (iii) (i) (3) (v) (iv) (i) (iii) (4) (ii) (iv) (i) (iii)

17. How does steroid hormone influence the cellular activities? **[NEET-2019]**
(1) Changing the permeability of the cell membrane.
(2) Binding to DNA and forming a gene-hormone complex.
(3) Activating cyclic AMP located on the cell membrane.
(4) Using aquaporin channels as second messenger.

18. Identify A, B and C in the diagramatic representation of the mechanism of hormone action. **[NEET-2019 ODISSA]**



Select the correct option from the following :
(1) A-Steroid Hormone; B-Hormone-receptor Complex, C-Protein
(2) A-Protein Hormone, B-Receptor; C-Cyclic AMP
(3) A-Steroid Hormone; B-Receptor, C – Second Messenger
(4) A-Protein Hormone; B-Cyclic AMP, C-Hormone-receptor Complex

19. Artificial light, extended work-time and reduced sleep time disrupt the activity of **[NEET-2019 ODISSA]**
(1) Thymus gland (2) Pineal gland (3) Adrenal gland (4) Posterior pituitary gland

20. Which of the following conditions will stimulate parathyroid gland to release parathyroid hormone? **[NEET-2019 ODISSA]**
(1) Fall in active Vitamin D levels (2) Fall in blood Ca^{+2} levels
(3) Fall in bone Ca^{+2} levels (4) Rise in blood Ca^{+2} levels

21. Match the following columns and select the correct option :- **[NEET-2020 COVID]**

Column-I	**Column-II**
(a) Pituitary hormone	(i) Steroid
(b) Epinephrine	(ii) Neuropeptides
(c) Endorphins	(iii) Peptides, proteins
(d) Cortisol	(iv) Biogenic amines

(1) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii) (2) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
(3) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii) (4) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

22. Hormones stored and released from neurohypophysis are :- **[NEET-2020 COVID]**
(1) Thyroid stimulating hormone and Oxytocin
(2) Oxytocin and Vasopressin
(3) Follicle stimulating hormone and Leutinizinghormone
(4) Prolactin and Vasopressin

23. Mach the following columns and select the correct option **[NEET-2020]**

Column – I	Column – II
(a) Pituitary gland	(i) Grave's disease
(b) Thyroid gland	(ii) Diabetes mellitus
(c) Adrenal gland	(iii) Diabetes insipidus
(d) Pancreas	(iv) Addison's disease

	(a)	(b)	(c)	(d)		(a)	(b)	(c)	(d)
1)	(ii)	(i)	(iv)	(iii)	2)	(iv)	(iii)	(i)	(ii)
3)	(iii)	(ii)	(i)	(iv)	4)	(iii)	(i)	(iv)	(ii)

24. Select the correct statement **[NEET-2020]**
1) Insulin is associated with hyperglycemia. 2) Glucocorticoids stimulate gluconeogenesis
3) Glucagon is associated with hypoglycemia 4) Insulin acts on pancreatic cells and adipocytes.

25. Erythropotetin hormone which stimulates RBC formation is produced by **[NEET-2021]**
1) The cells of rostral adenohypophysis 2) The cells of bone marrow

3) Juxtaglomerular cells of the kidney 4) Alpha cells of pancreas

26. Which of the following are not the effects of Parathyroid hormone? **[NEET-2022]**

(a) Stimulates the process of bone resorption

(b) Decreases Ca^{2+} level in blood

(c) Reabsorption of Ca^{2+} by renal tubules

(d) Decreases the absorption of Ca^{2+} digested food

(e) Increases metabolism of carbohydrates

Choose the most appropriate answer from options given below:

1) (a) and (c) only 2) (b), (d) and (e) only

3) (a) and (e) only 4) (b) and (c) only

NCERT LINE BY LINE QUESTIONS – ANSWERS

Q	1	2	3	4	5	6	7	8	9	10
Ans	B	A	C	A	B	C	D	A	D	D
Q	11	12	13	14	15	16	17	18	19	20
Ans	B	B	A	B	C	D	B	C	B	A
Q	21	22	23	24	25	26	27	28	29	30
Ans	A	A	D	D	C	C	C	D	C	B
Q	31	32	33	34	35	36	37	38	39	40
Ans	B	D	D	A	B	A	C	D	A	C
Q	41	42	43	44	45	46	47	48	49	50
Ans	C	B	C	B	A	D	C	C	B	C
Q	51	52	53	54	55	56	57	58	59	60
Ans	D	C	C	B	B	C	D	A	A	A
Q	61	62	63	64	65	66	67	68	69	70
Ans	C	A	B	B	A	B	D	C	A	C
Q	71	72	73	74	75	76	77	78	79	80
Ans	A	C	D	C	C	B	D	B	C	A
Q	81	82	83	84	85	86	87	88	89	90
Ans	C	C	D	C	D	B	B	C	D	B
Q	91	92	93	94	95	96	97	98	99	100
Ans	B	B	A	C	C	A	B	C	D	C
Q	101	102	103	104	105	106	107	108	109	110
Ans	A	B	C	D	B	C	B	D	D	D
Q	111	112	113	114	115	116	117	118	119	120
Ans	D	B	A	D	C	A	C	C	B	C
Q	121	122	123	124						
Ans	B	A	D	B						

NEET PREVIOUS YEARS QUESTIONS-ANSWERS

1. (c)	2. (b)	3. (a)	4. (b)	5. (a)	6. (a)	7. (d)	8. (a)	9. (b)	10. (a)
11. (d)	12. (b)	13. (b)	14. (c)	15. (2)	16. (3)	17. (2)	18. (2)	19. (2)	20. (2)
21. (2)	22. (2)	23. (4)	24. (2)	25. (3)	26. (2)				

NEET PREVIOUS YEARS QUESTIONS-EXPLANATIONS

1. (c)

2. (b) The limbic system (emotional motor system) is responsible for the experience and expression of emotion but not movement. It is located in the core of the brain and includes the amygdala, hippocampus and hypothalamus.

3. (a) Epinephrine is an amino acid derived hormone. It is derived from tyrosine by the removal of carboxyl group. It is a type of catecholamine.

4. (b) Corpus luteum is the temporary endocrine gland formed in the ovary after ovulation. It release hormones like progesterone, oestrogen etc.

5. (a) GnRH is secreted by hypothalamus which stimulates anterior pituitary gland for the secretion of gonadotropins follicle stimulating hormone (FSH) and luteinising hormone (LH).

6. (a) The epiphyseal plate is a hyaline cartilage plate in the metaphysis at each end of a long bone. Epiphyseal plate, responsible for bone growth, close after adolescence, due to which hypersecretion of growth hormone in adults does not cause further increase in height.

7. (d) Inhibin is a hormone secreted by granulosa cells of the ovary which inhibit the secretion of FSH (Follicle Stimulating Hormone) whereas relaxin produced by ovary and placenta at the time of childbirth to softens the ligament in the pelvis and widens the cervix.

8. (a)

9. (b) Inhibin is a protein, secreted by granulosa cell (in female) and sertoli cell (in male) in response to FSH. Its major action is the negative feedback control of pituitary FSH secretion.

10. (a) Aldosterone is not involved in sugar metabolism. It is produced by adrenal cortex and plays an important role in the regulation of Na+ and K+ levels in the body.

11. (d) ADH (Antidiuretic hormone) and oxytocin are produced by hypothalamus and stored in posterior pituitary gland.

12. (b) Epinephrine has two role as a hormone and as a neurotransmitter.

13. (b)

14. (c)

23. Graves' disease is due to excess secretion of thyroid hormones.
Diabetes mellitus is due to less secretion of insulin from β-cells of pancreas.
Diabetes insipidus is due to less secretion of ADH from posterior pituitary.
Addison's disease is due to less secretion of hormone from adrenal cortex.

24. Glucagon is associated with hyperglycemia. Insulin acts on hepatocytes and adipocytes and is associated with hypoglycemia. Glucocorticoids stimulate gluconeogenesis

25. Erythropoitin is produced by the modified smooth muscles of afferent arteriole called juxta glomerular cells

26. b, d, & e are not correct