

# Chemical Coordination and Integration

## 22.0 Introduction

1. Which one of the following statements is correct?
- Endocrine glands regulate neural activity, but not *vice versa*.
  - Neurons regulate endocrine activity, but not *vice versa*.
  - Endocrine glands regulate neural activity and nervous system regulates endocrine glands.
  - Neither hormones control neural activity nor the neurons control endocrine activity. (2006)

## 22.2 Human Endocrine System

2. Presence of which of the following conditions in urine are indicative of diabetes mellitus?
- Uremia and Ketonuria
  - Uremia and Renal Calculi
  - Ketonuria and Glycosuria
  - Renal calculi and Hyperglycaemia (NEET 2020)
3. Match the following columns and select the correct option.

**Column-I**

- (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) (iv)      (iii)      (i)      (ii)  
(b) (iii)      (ii)      (i)      (iv)  
(c) (iii)      (i)      (iv)      (ii)  
(d) (ii)      (i)      (iv)      (iii)      (NEET 2020)

4. Select the correct statement.

- Glucocorticoids stimulate gluconeogenesis.
- Glucagon is associated with hypoglycemia.
- Insulin acts on pancreatic cells and adipocytes.
- Insulin is associated with hyperglycemia.

(NEET 2020)

5. Match the following hormones with their respective disease.

- |                    |                         |
|--------------------|-------------------------|
| (A) Insulin        | (i) Addison's disease   |
| (B) Thyroxin       | (ii) Diabetes insipidus |
| (C) Corticoids     | (iii) Acromegaly        |
| (D) Growth hormone | (iv) Goitre             |
|                    | (v) Diabetes mellitus   |

Select the correct option.

- |          |      |       |       |
|----------|------|-------|-------|
| (A)      | (B)  | (C)   | (D)   |
| (a) (ii) | (iv) | (i)   | (iii) |
| (b) (v)  | (i)  | (ii)  | (iii) |
| (c) (ii) | (iv) | (iii) | (i)   |
| (d) (v)  | (iv) | (i)   | (iii) |
- (NEET 2019)

6. Which of the following hormones can play a significant role in osteoporosis?

- Aldosterone and prolactin
- Progesterone and aldosterone
- Estrogen and parathyroid hormone
- Parathyroid hormone and prolactin

(NEET 2018)

7. GnRH, a hypothalamic hormone, needed in reproduction, acts on

- anterior pituitary gland and stimulates secretion of LH and FSH
- posterior pituitary gland and stimulates secretion of oxytocin and FSH
- posterior pituitary gland and stimulates secretion of LH and relaxin
- anterior pituitary gland and stimulates secretion of LH and oxytocin.

(NEET 2017)

8. Hypersecretion of growth hormone in adults does not cause further increase in height, because

- epiphyseal plates close after adolescence
- bones loose their sensitivity to growth hormone in adults
- muscle fibres do not grow in size after birth
- growth hormone becomes inactive in adults.

(NEET 2017)

- 9.** A temporary endocrine gland in the human body is  
 (a) corpus cardiacum  
 (b) corpus luteum  
 (c) corpus allatum  
 (d) pineal gland. (NEET 2017)
- 10.** Graves' disease is caused due to  
 (a) hyposecretion of thyroid gland  
 (b) hypersecretion of thyroid gland  
 (c) hyposecretion of adrenal gland  
 (d) hypersecretion of adrenal gland. (NEET-II 2016)
- 11.** Name a peptide hormone which acts mainly on hepatocytes, adipocytes and enhances cellular glucose uptake and utilisation.  
 (a) Insulin  
 (b) Glucagon  
 (c) Secretin  
 (d) Gastrin (NEET-II 2016)
- 12.** The posterior pituitary gland is not a 'true' endocrine gland because  
 (a) it is provided with a duct  
 (b) it only stores and releases hormones  
 (c) it is under the regulation of hypothalamus  
 (d) it secretes enzymes. (NEET-II 2016)
- 13.** Which of the following pairs of hormones are not antagonistic (having opposite effects) to each other?  
 (a) Aldosterone      Atrial Natriuretic Factor  
 (b) Relaxin           Inhibin  
 (c) Parathormone    Calcitonin  
 (d) Insulin           Glucagon (NEET-I 2016)
- 14.** Which one of the following hormones is not involved in sugar metabolism?  
 (a) Insulin  
 (b) Glucagon  
 (c) Cortisone  
 (d) Aldosterone (2015)
- 15.** Which one of the following hormones though synthesised elsewhere, is stored and released by the master gland?  
 (a) Prolactin  
 (b) Melanocyte stimulating hormone  
 (c) Antidiuretic hormone  
 (d) Luteinising hormone (2015)
- 16.** Fight-or-flight reactions cause activation of  
 (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 norepinephrine  
 (d) the pancreas leading to a reduction in the blood sugar levels. (2014)
- 17.** A pregnant female delivers a baby who suffers from stunted growth, mental retardation, low intelligence quotient and abnormal skin.  
 This is the result of  
 (a) cancer of the thyroid gland  
 (b) oversecretion of pars distalis  
 (c) deficiency of iodine in diet  
 (d) low secretion of growth hormone. (NEET 2013)
- 18.** Select the answer which correctly matches the endocrine gland with the hormone it secretes and its function/deficiency symptom.
- | <b>Endocrine Hormone</b> | <b>Function/Deficiency symptoms</b> |  |
|--------------------------|-------------------------------------|--|
| <b>gland</b>             |                                     |  |
| (a) Thyroid gland        | Thyroxine                           | Lack of iodine in diet results in goitre         |
| (b) Corpus luteum        | Testosterone                        | Stimulates spermatogenesis                       |
| (c) Anterior pituitary   | Oxytocin                            | Stimulates uterus contraction during child birth |
| (d) Posterior pituitary  | Growth hormone (GH)                 | Oversecretion stimulates abnormal growth         |
- (NEET 2013)
- 19.** Select the option which correctly matches the endocrine gland with its hormone and its function.
- | <b>Endocrine Hormone</b> | <b>Function</b> |  |
|--------------------------|-----------------|--|
| <b>gland</b>             |                 |  |
| (a) Placenta             | Estrogen        | Initiates secretion of the milk                                  |
| (b) Corpus luteum        | Estrogen        | Essential for maintenance of endometrium                         |
| (c) Leydig's cells       | Androgen        | Initiates the production of sperms                               |
| (d) Ovary                | FSH             | Stimulates follicular development and the secretion of estrogens |
- (Karnataka NEET 2013)
- 20.** Nor-epinephrine  
 (i) is released by sympathetic fibers  
 (ii) is released by parasympathetic fibers  
 (iii) increases the heart rate  
 (iv) decreases blood pressure.  
 Which of the above statements are correct?  
 (a) (i) and (iii)  
 (b) (ii) and (iii)  
 (c) (ii) and (iv)  
 (d) (i) and (iv) (Karnataka NEET 2013)

- 21.** Which of the following represents the action of insulin?  
 (a) Increases blood glucose level by stimulating glucagon production.  
 (b) Decreases blood glucose levels by forming glycogen.  
 (c) Increases blood glucose levels by promoting cellular uptake of glucose.  
 (d) Increases blood glucose levels by hydrolysis of glycogen. *(Karnataka NEET 2013)*
- 22.** A person entering an empty room suddenly finds a snake right in front on opening the door. Which one of the following is likely to happen in his neuro-hormonal control system?  
 (a) Sympathetic nervous system is activated releasing epinephrine and norepinephrine from adrenal medulla.  
 (b) Neurotransmitters diffuse rapidly across the cleft and transmit a nerve impulse.  
 (c) Hypothalamus activates the parasympathetic division of brain.  
 (d) Sympathetic nervous system is activated releasing epinephrine and norepinephrine from adrenal cortex. *(2012)*
- 23.** The 24 hour (diurnal) rhythm of our body such as the sleep-wake cycle is regulated by the hormone  
 (a) calcitonin  
 (b) prolactin  
 (c) adrenaline  
 (d) melatonin. *(Mains 2011)*
- 24.** Match the source gland with its respective hormone and function and select the correct option.
- | Source gland            | Hormone     | Function  |
|-------------------------|-------------|---|
| (a) Anterior pituitary  | Oxytocin    | Contraction of uterus muscles during child birth                      |
| (b) Posterior pituitary | Vasopressin | Stimulates reabsorption of water in the distal tubules in the nephron |
| (c) Corpus luteum       | Estrogen    | Supports pregnancy  |
| (d) Thyroid             | Thyroxine   | Regulates blood calcium level <i>(2011)</i>                           |
- 25.** Given below is an incomplete table on hormones, their source glands and one major effect of each human body. Identify the option representing correct grouping of hormone its gland and effect.
- | Gland | Secretion | Effect on body                             |
|-------|-----------|--|
| A     | Estrogen  | Maintenance of secondary sexual characters |
- Alpha cells of Islets of Langerhans**      **B**      **Raises blood sugar level**
- Anterior pituitary**      **C**      **Over secretion leads to gigantism**
- A                  B                  C**
- | (a) Ovary    | Glucagon | Growth hormone |
|--------------|----------|----------------|
| (b) Placenta | Insulin  | Vasopressin    |
| (c) Ovary    | Insulin  | Calcitonin     |
| (d) Placenta | Glucagon | Calcitonin     |
- (2011)*
- 26.** Injury to adrenal cortex is not likely to affect the secretion of which one of the following?  
 (a) Aldosterone  
 (b) Both androstenedione and dehydroepiandrosterone  
 (c) Adrenaline  
 (d) Cortisol *(2010)*
- 27.** Which one of the following pairs is incorrectly matched?  
 (a) Glucagon – Beta cells (source)  
 (b) Somatostatin – Delta cells (source)  
 (c) Corpus luteum – Relaxin (secretion)  
 (d) Insulin – Diabetes mellitus (disease) *(2010)*
- 28.** Toxic agents present in food which interfere with thyroxine synthesis lead to the development of  
 (a) toxic goitre      (b) cretinism  
 (c) simple goitre      (d) thyrotoxicosis. *(2010)*
- 29.** Select the correct matching of a hormone, its source and function.
- | Hormone            | Source                             | Function   |
|--------------------|------------------------------------|--|
| (a) Vasopressin    | Posterior pituitary                | Increases loss of water through urine  |
| (b) Norepinephrine | Adrenal medulla                    | Increases heart beat, rate of respiration and altness                          |
| (c) Glucagon       | Beta-cells of Islets of Langerhans | Stimulates glycogenolysis  |
| (d) Prolactin      | Posterior pituitary                | Regulates growth of mammary glands and milk formation in females <i>(2010)</i> |
- 30.** A health disorder that results from the deficiency of thyroxine in adults and characterised by (i) a low metabolic rate, (ii) increase in body weight and (iii) tendency to retain water in tissues is  
 (a) simple goitre      (b) myxoedema  
 (c) cretinism      (d) hypothyroidism. *(2009)*

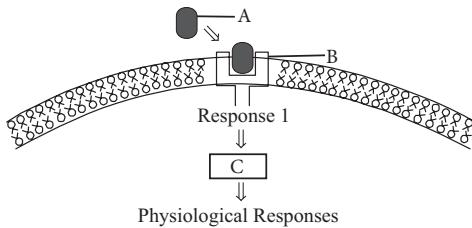
- 31.** Which one of the following pair of organs includes only the endocrine glands?  
 (a) Thymus and testes  
 (b) Adrenal and ovary  
 (c) Parathyroid and adrenal  
 (d) Pancreas and parathyroid (2008)
- 32.** The blood calcium level is lowered by the deficiency of  
 (a) both calcitonin and parathormone  
 (b) calcitonin  
 (c) parathormone  
 (d) thyroxine. (2008)
- 33.** Feeling the tremors of an earthquake a scared resident of seventh floor of a multistoried building starts climbing down the stairs rapidly.  
 Which hormone initiated this action?  
 (a) Adrenaline (b) Glucagon  
 (c) Gastrin (d) Thyroxine (2007)
- 34.** A person is having problems with calcium and phosphorus metabolism in his body. Which one of the following glands may not be functioning properly?  
 (a) Parotid (b) Pancreas  
 (c) Thyroid (d) Parathyroid (2007)
- 35.** Which hormone causes dilation of blood vessels, increased oxygen consumption and glucogenesis?  
 (a) Glucagon (b) ACTH  
 (c) Insulin (d) Adrenaline (2006)
- 36.** Which of the following is an accumulation and release centre of neurohormones?  
 (a) Anterior pituitary lobe  
 (b) Posterior pituitary lobe  
 (c) Intermediate lobe of the pituitary  
 (d) Hypothalamus (2006)
- 37.** A steroid hormone which regulates glucose metabolism is  
 (a) cortisone  
 (b) cortisol  
 (c) corticosterone  
 (d) 11-deoxycorticosterone. (2006)
- 38.** Which one of the following pairs correctly matches a hormone with a disease resulting from its deficiency?  
 (a) Luteinising - Failure of ovulation hormone  
 (b) Insulin - Diabetes insipidus  
 (c) Thyroxine - Tetany  
 (d) Parathyroid - Diabetes mellitus hormone (2004)
- 39.** Which one of the following pairs correctly matches a hormone with a disease resulting from its deficiency?  
 (a) Relaxin - Gigantism  
 (b) Prolactin - Cretinism  
 (c) Parathyroid hormone - Tetany  
 (d) Insulin - Diabetes insipidus (2003)
- 40.** Acromegaly is caused by  
 (a) excess of STH  
 (b) excess of thyroxine  
 (c) deficiency of thyroxine  
 (d) excess of adrenaline. (2002)
- 41.** Adrenaline directly affects on  
 (a) SA node  
 (b)  $\beta$ -cells of Langerhans  
 (c) dorsal root of spinal nerve  
 (d) epithelial cells of stomach. (2002)
- 42.** When both ovaries are removed from rat then which hormone is decreased in blood?  
 (a) Oxytocin  
 (b) Prolactin  
 (c) Estrogen  
 (d) Gonadotropin releasing factor (2002)
- 43.** Mainly which type of hormones control the menstrual cycle in human beings?  
 (a) FSH (b) LH  
 (c) FSH, LH, estrogen  
 (d) progesterone (2002)
- 44.** Which set is similar?  
 (a) Corpus luteum - Graafian follicles  
 (b) Sebum - Sweat  
 (c) Bundle of His - Pace maker  
 (d) Vitamin B<sub>7</sub> - Niacin (2001)
- 45.** Melatonin is secreted by  
 (a) pineal body (b) skin  
 (c) pituitary gland (d) thyroid. (2000)
- 46.** Which gland secretes odorous secretion in mammals?  
 (a) Bartholins (b) Prostate  
 (c) Anal gland (d) Liver (2000)
- 47.** MSH is secreted by  
 (a) anterior lobe of pituitary  
 (b) middle lobe of pituitary  
 (c) posterior lobe of pituitary  
 (d) endostyle. (2000)
- 48.** The function of oxytocin is to help in  
 (a) child birth (b) gametogenesis  
 (c) growth (d) lactation. (1999)
- 49.** Secretion of progesterone by corpus luteum is initiated by  
 (a) testosterone (b) thyroxine  
 (c) MSH (d) LH. (1999)

- 50.** The gonadotrophic hormones are secreted by  
 (a) anterior lobe of pituitary  
 (b) interstitial cells of testes  
 (c) adrenal cortex  
 (d) posterior part of thyroid. (1999)
- 51.** Diabetes is due to  
 (a) enzyme deficiency  
 (b) iodine deficiency  
 (c)  $\text{Na}^+$  deficiency  
 (d) hormonal deficiency. (1999)
- 52.** Calcitonin is a thyroid hormone which  
 (a) elevates calcium level in blood  
 (b) has no effect on calcium  
 (c) elevates potassium level in blood  
 (d) lowers calcium level in blood. (1998)
- 53.** The hormone which regulates the basal metabolism in our body is secreted from  
 (a) adrenal cortex (b) pancreas  
 (c) pituitary (d) thyroid. (1998)
- 54.** Which hormone stimulates the secretion of milk from female?  
 (a) Oxytocin  
 (b) Progesterone  
 (c) LH  
 (d) Prolactin (1996)
- 55.** The immediate cause of induction of ovulation in human female is the large plasma surge of  
 (a) LH (b) FSH  
 (c) progesterone (d) estradiol. (1994)
- 56.** Testosterone is produced by  
 (a) sertoli cells  
 (b) Leydig's cells  
 (c) oxyntic cells  
 (d) pituitary gland. (1993)
- 57.** ADH or vasopressin is  
 (a) enzyme that hydrolyses peptides  
 (b) hormone secreted by pituitary that promotes reabsorption of water from glomerular filtrate  
 (c) hormone that promotes glycogenolysis  
 (d) energy rich compound connected with muscle contraction. (1991)
- 58.** Occurrence of Leydig's cells and their secretion is  
 (a) ovary and estrogen  
 (b) liver and cholesterol  
 (c) pancreas and glucagon  
 (d) testis and testosterone. (1991)
- 59.** Insulin is a  
 (a) vitamin (b) lipid  
 (c) hormone (d) enzyme. (1990)
- 60.** Which hormone possesses anti-insulin effect?  
 (a) Cortisol
- (b) Calcitonin  
 (c) Oxytocin  
 (d) Aldosterone (1988)
- 61.** MSH of pars intermedia of middle pituitary is responsible for  
 (a) darkening of skin in lower vertebrates  
 (b) light colouration of skin in lower vertebrates  
 (c) both A and B  
 (d) darkening of skin in human beings. (1988)
- 22.3 Hormones of Heart, Kidney and Gastrointestinal Tract**
- 62.** 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 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. (2014)
- 63.** Which of the following statements is correct in relation to the endocrine system?  
 (a) Non-nutrient chemicals produced by the body in trace amounts that act as intercellular messenger are known as hormones.  
 (b) Releasing and inhibitory hormones are produced by the pituitary gland.  
 (c) Adenohypophysis is under direct neural regulation of the hypothalamus.  
 (d) Organs in the body like gastrointestinal tract, heart, kidney and liver do not produce any hormones. (NEET 2013)
- 64.** Cholecystokinin and duocrinin are secreted by  
 (a) adrenal cortex (b) thyroid gland  
 (c) intestine (d) pancreas. (1999)
- 65.** The hormone that stimulates the stomach to secrete gastric juice is  
 (a) enterokinase  
 (b) enterogastrone  
 (c) gastrin  
 (d) renin. (1998)
- 66.** The contraction of gall bladder is due to  
 (a) cholecystokinin (b) enterogastrone  
 (c) gastrin (d) secretin. (1998)
- 67.** Gastric secretion is stopped by hormone  
 (a) enterogastrone  
 (b) gastrin  
 (c) pancreozymin  
 (d) cholecystokinin. (1993)

## 22.4 Mechanism of Hormone Action

68. How does steroid hormone influence the cellular activities?
- Using aquaporin channels 'as second messenger'
  - Changing the permeability of the cell membrane
  - Binding to DNA and forming a gene-hormone complex
  - Activating cyclic AMP located on the cell membrane
- (NEET 2019)

69. Identify A, B and C in the diagrammatic representation of the mechanism of hormone action.



Select the correct option from the following.

- A-Steroid Hormone; B-Hormone-receptor Complex; C-Protein
- A-Protein Hormone; B-Receptor; C-Cyclic AMP
- A-Steroid Hormone; B-Receptor; C - Second Messenger
- A-Protein Hormone; B-Cyclic AMP; C-Hormone-receptor Complex

(Odisha NEET 2019)

70. Which of the following is an amino acid derived hormone?

- Epinephrine
  - Ecdysone
  - Estradiol
  - Estriol
- (NEET 2018)

71. The amino acid tryptophan is the precursor for the synthesis of

- estrogen and progesterone
  - cortisol and cortisone
  - melatonin and serotonin
  - thyroxine and triiodothyronine.
- (NEET-I 2016)

72. Which of the following best illustrates "feedback" in development?

- Tissue X secretes RNA which changes the development of tissue Y.
- As tissue X develops, it secretes enzymes that inhibit the development of tissue Y.
- As tissue X develops, it secretes something that induces tissue Y to develop.
- As tissue X develops, it secretes something that slows down the growth of tissue Y.

(Karnataka NEET 2013)

73. Which one of the following pairs of hormones are the examples of those that can easily pass through the cell membrane of the target cell and bind to a receptor inside it (mostly in the nucleus)?

- Insulin, glucagon
  - Thyroxine, insulin
  - Somatostatin, oxytocin
  - Cortisol, testosterone
- (2012)

74. What is correct to say about the hormone action in humans?

- Glucagon is secreted by  $\beta$ -cells of islets of Langerhans and stimulates glycogenolysis.
  - Secretion of thymosins is stimulated with aging.
  - In females, FSH first binds with specific receptors on ovarian cell membrane.
  - FSH stimulates the secretion of estrogen and progesterone.
- (2012)

75. Which one of the following pairs of chemical substances, is correctly categorised?

- Calcitonin and thymosin - Thyroid hormones
  - Pepsin and prolactin - Two digestive enzymes secreted in stomach
  - Troponin and myosin - Complex proteins in striated muscles
  - Secretin and rhodopsin - Polypeptide hormones
- (2012)

76. Which one of the following is not a secondary messenger in hormone action?

- cAMP
  - cGMP
  - Calcium
  - Sodium
- (2006)

77. Which one of the following hormones is modified amino acid?

- Epinephrine
  - Progesterone
  - Prostaglandin
  - Estrogen
- (2004)

78. Chemically hormones are

- biogenic amines only
  - proteins, steroids and biogenic amines
  - proteins only
  - steroids only.
- (2004)

79. Hormones thyroxine, adrenaline and the pigment melanin are formed from

- tyrosine
  - proline
  - tryptophan
  - glycine.
- (1997)

80. Which one of the following endocrine glands stores its secretion in the extracellular space before discharging it into the blood?

- Testis
  - Thyroid
  - Pancreas
  - Adrenal
- (1995)

81. According to the accepted concept of hormone action, if receptor molecules are removed from target organs, then the target organ will

- continue to respond to the hormone without any difference
  - not respond to the hormone
  - continue to respond to the hormone but will require higher concentration
  - continue to respond to the hormone but in the opposite way.
- (1995)

**ANSWER KEY**

1. (c) 2. (c) 3. (c) 4. (a) 5. (d) 6. (c) 7. (a) 8. (a) 9. (b) 10. (b)  
11. (a) 12. (b) 13. (b) 14. (d) 15. (c) 16. (c) 17. (c) 18. (a) 19. (c) 20. (a)  
21. (b) 22. (a) 23. (d) 24. (b) 25. (a) 26. (c) 27. (a) 28. (c) 29. (b) 30. (b)  
31. (c) 32. (c) 33. (a) 34. (d) 35. (d) 36. (d) 37. (b) 38. (a) 39. (c) 40. (a)  
41. (a) 42. (c) 43. (c) 44. (a) 45. (a) 46. (c) 47. (b) 48. (a,d) 49. (d) 50. (a)  
51. (d) 52. (d) 53. (d) 54. (d) 55. (a) 56. (b) 57. (b) 58. (d) 59. (c) 60. (a)  
61. (a) 62. (b) 63. (a) 64. (c) 65. (c) 66. (a) 67. (a) 68. (c) 69. (b) 70. (a)  
71. (c) 72. (c) 73. (d) 74. (c) 75. (c) 76. (d) 77. (a) 78. (b) 79. (a) 80. (b)  
81. (b)