

NCERT Solutions for Class 11 Biology Chapter 22 Chemical Coordination and integration

Q1. Define the following:

(a) Exocrine gland

Answer:

Exocrine gland-

The glands which discharge their secretions into ducts are known as exocrine glands. Examples of exocrine glands include sebaceous gland in the skin, salivary gland in the buccal cavity, etc.

Q1. Define the following:

(b) Endocrine gland

Answer:

Endocrine glands-

The glands which do not discharge their secretions into ducts are known as endocrine glands. These glands discharge their secretions directly into the blood. Examples of endocrine glands include Pituitary gland, thyroid gland, adrenal gland, etc.

Q1. Define the following:

(c) Hormone

Answer:

Hormones-

The hormones are chemical messengers that regulate physiological processes in living organisms. They act upon specific cells/tissues/organs.

Q2. Diagrammatically indicate the location of the various endocrine glands in our body.

Answer:

Location of the various endocrine glands in our body is depicted below

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Q3. List the hormones secreted by the following:

(a) Hypothalamu

Answer:

The hormones secreted by the hypothalamus include divided into two groups

(1). Releasing hormones- These include gonadotropin-releasing hormone, thyrotropin-releasing hormone, somatotropin-releasing hormone, adrenocorticotrophin-releasing hormone

(2). Inhibiting hormones: These include somatostatin, growth-inhibiting hormone, melanocyte-inhibiting hormone

Q3. List the hormones secreted by the following:

(b) Pituitary

Answer:

The pituitary gland has two components i.e., adenohypophysis and neurohypophysis.

Hormones secreted by the adenohypophysis are growth hormone (GH), prolactin, thyroid-stimulating hormone (TSH), adrenocorticotrophic hormone (ACTH), luteinizing hormone (LH), follicle-stimulating hormone (FSH), melanocyte-stimulating hormone (MSH)

Hormones secreted by the neurohypophysis are oxytocin and vasopressin

Q3. List the hormones secreted by the following: (c) Thyroid

Answer:

Thyroid gland- The thyroid gland secretes three hormones namely, thyroxin, triiodothyronine, and calcitonin.

Q3. List the hormones secreted by the following:

(d) Parathyroid

Answer:

Parathyroid- It secretes parathyroid hormone

Q3. List the hormones secreted by the following:

(e) Adrenal

Answer:

Adrenal gland - The adrenal gland is divided into two parts, the outer adrenal cortex and the inner adrenal medulla.

Hormones of adrenal cortex include aldosterone and cortisol.

Hormones of adrenal medulla are adrenaline and nor-adrenalin.

Q3. List the hormones secreted by the following:

(f) Pancrea

Answer:

Pancreas: Hormones secreted by the pancreas are insulin and glucagon.

Q3. List the hormones secreted by the following:

(g) Testi

Answer:

Testis: The hormone secreted by the testis is testosterone.

Q3. List the hormones secreted by the following:

(h) Ovary

Answer:

Ovary: The hormone secreted by the ovary includes estrogen and progesterone.

Q3. List the hormones secreted by the following:

(i) Thymus

Answer:

Thymus: Hormones secreted by the thymus are thymosins.

Q3. List the hormones secreted by the following:

(j) Atrium

Answer:

Atrium: The walls of the atrium secrete atrial natriuretic factor.

Q3. List the hormones secreted by the following:

(k) Kidney

Answer:

Kidney: The hormone secreted by the kidney is erythropoietin.

Q3. List the hormones secreted by the following:

(I) G-I Tract

Answer:

G-I tract- The hormones secreted by the G-I tract are Gastrin, secretin, cholecystokinin (CCK), and gastric inhibitory peptide (GIP).

Q4. Fill in the blanks:

Hormones Target gland

- (a) Hypothalamic hormones _____
- (b) Thyrotrophin (TSH) _____
- (c) Corticotrophin (ACTH) _____
- (d) Gonadotrophins (LH, FSH) _____
- (e) Melanotrophin (MSH) _____

Answer:

Hormones Target gland

- (a) Hypothalamic hormones Pituitary gland
- (b) Thyrotrophin (TSH) Thyroid gland
- (c) Corticotrophin (ACTH) Adrenal cortex
- (d) Gonadotrophins (LH, FSH) Testis and ovaries
- (e) Melanotrophin (MSH) Pigment cells of the dermis of the skin

Q5. Write short notes on the functions of the following hormones:

(a) Parathyroid hormone (PTH)

Answer:

Function of Parathyroid hormone (PTH):

- The parathyroid hormone maintains the calcium levels in the body.
- It increases the calcium levels of the blood.
- It stimulates bone resorption which demineralises bones increasing blood calcium levels.
- It also stimulates calcium absorption by renal tubules and from the digested food.

Q5. Write short notes on the functions of the following hormones:

(b) Thyroid hormone

Answer:

Function of Thyroid hormones are given below:

Thyroxine/tetraiodothyronine (T4):

- It regulates the basal metabolic rate (BMR).
- It regulates body growth such as ossification of bones and mental development.
- It controls body weight.
- It also controls tissue differentiation and metamorphosis of the tadpole larva into an adult frog.
- It suppresses RBC formation.

Tri-iodothyronine (T3):

- It increases the body's oxygen and energy consumption.
- It increases the heart rate and force of contraction which increases the cardiac output.

Q5. Write short notes on the functions of the following hormones:

(c) Thymosin

Answer:

Function of Thymosins given below:

- Thymosin stimulates the differentiation of T-lymphocytes and provides cell-mediated immunity.
- It promotes the production of antibodies to provide humoral immunity.
- It also stimulates the rate of cell division in kids and hence promotes growth.

Q5. Write short notes on the functions of the following hormones:

(d) Androgens

Answer:

The function of Androgens are given below:

Testosterone:

Testosterone helps in the maturation of sperms.

It stimulates the growth and development of the male reproductive system.

It stimulates the development of secondary sexual characters such as beard and moustache.

It produces anabolic effects on protein and carbohydrate metabolism.

Androsterone:

It affects the masculinisation of the foetus and child, and maintains or creates masculine traits in adults.

Q5. Write short notes on the functions of the following hormones:

(e) Estrogen

Answer:

The primary function of estrogens is the development of female secondary sexual characteristics. These include breasts, endometrium, regulation of the menstrual cycle, etc. In males, estrogen helps in maturation of the sperm and maintenance of a healthy libido.

Q5. Write short notes on the functions of the following hormones:

(f) Insulin and Glucagon

Answer:

The function of Insulin and Glucagon are given below:

Insulin:

It plays a major role in the regulation of glucose homeostasis.

It acts on hepatocytes and adipocytes.

It stimulates the transport of glucose from the blood to muscle.

It promotes the oxidation of glucose and the conversion of glucose to glycogen, i.e. glycogenesis, resulting in hypoglycemia.

Glucagon:

It plays a major role in the maintenance of normal blood glucose levels.

It acts on hepatocytes and stimulates the conversion of glycogen into glucose.

It also stimulates the process of gluconeogenesis, i.e. the conversion of non-carbohydrate substances such as fats and proteins to glucose.

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Q6. Give example(s) of:

(a) Hyperglycemic hormone and hypoglycemic hormone

Answer:

Hyperglycemic hormone- glucagon

hypoglycemic hormone- insulin

Q6. Give example(s) of:

(b) Hypercalcemic hormone

Answer:

Parathormone hormone

Q6. Give example(s) of:

(c) Gonadotrophic hormone

Answer:

Luteinising hormone (LH)

Follicle-stimulating hormone (FSH)

Q6. Give example(s) of:

(d) Progestational hormone

Answer:

Progesterone

Q6. Give example(s) of:

(e) Blood pressure lowering hormone

Answer:

Atrial natriuretic factor

Q6. Give example(s) of:

(f) Androgens and estrogens

Answer:

Androgens : Testosterone and androsterone

Estrogens : β -oestradiol

Q7. Which hormonal deficiency is responsible for the following:

(a) Diabetes mellitu

Answer:

Insufficient secretion of insulin is responsible.

Q7. Which hormonal deficiency is responsible for the following:

(b) Goitre

Answer:

Insufficient secretion of thyroxin is responsible.

Q7. Which hormonal deficiency is responsible for the following:

(c) Cretinism

Answer:

Insufficient secretion of thyroxine is responsible.

Q8. Briefly mention the mechanism of action of FSH.

Answer:

Follicle-stimulating hormone (FSH) is a glycoprotein polypeptide hormone. It is insoluble in lipid and hence cannot enter the target cell. This hormone binds to the cell surface and activates cellular systems to perform functions.

Steps in action of FSH:

- A molecule of FSH binds on the receptor protein present on the cell surface and forms the hormone-receptor complex.
- Formation of hormone-receptor complex activates the enzyme adenylyl cyclase.
- Adenylyl cyclase converts ATP into cyclic AMP (cAMP) as a second messenger.
- cAMP activates the follicular cells of membrane granulosa to secrete estrogens.

Q9. Match the following:

Column I	Column II
(a) T ₄	(i) Hypothalamus
(b) PTH	(ii) Thyroid
(c) GnRH	(iii) Pituitary
(d) LH	(iv) Parathyroid

Answer:

(a) T ₄	(ii) Thyroid
(b) PTH	(iv) Parathyroid
(c) GnRH	(i) Hypothalamus
(d) LH	(iii) Pituitary
Column I	Column II