Chemical Coordination and Integration

CHAPTER 22

NCERT FOCUS

ANSWERS

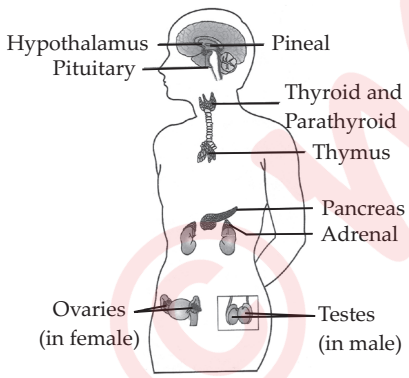
Topic 1

1. (a) Exocrine gland is a gland that pours its secretion on the surface or into a particular region by means of ducts for performing a metabolic activity, *e.g.*, sebaceous glands, sweat glands, salivary glands and intestinal glands.

(b) Endocrine glands are glands which have no ducts and their secretions get absorbed into the immediate surrounding blood circulation to reach the specific organs to initiate a particular metabolic change, *e.g.*, thyroid, parathyroids, adrenal, etc.

(c) Hormone is a non-nutrient chemical and is secreted in very small quantities into the blood stream by an endocrine gland or a specialised nerve cell and regulates the growth or functioning of a specific tissue, organ in a distant part of the body, *e.g.*, insulin.

2. Location of various endocrine glands in our body is shown below :



3. (a) Pituitary

(b) Thyroid

(c) Adrenal cortex

(d) Gonads –Testes in male and ovaries in female

(e) Skin

4. (a) Parathyroid hormone increases the level of calcium and decreases the level of phosphate in the blood.

(b) Thyroid gland secretes three hormones: thyroxine, triiodothyronine and calcitonin. Thyroxine and triiodothyronine control the general metabolism of the body, promote growth of body tissues and stimulates tissue differentiation. Calcitonin regulates the concentration of calcium in the blood.

(c) Androgens are secreted by testis. They stimulate the development of male reproductive system, formation of sperms, development of male accessory sex characters and also determines the male sexual behavior and the sex urge.

(d) Estrogens are secreted by ovaries. They stimulate the female reproductive tract to grow to full size and become functional, differentiation of ova and development of accessory sex characters.

(e) Insulin is secreted by the β-cells of the pancreas. It lowers blood glucose level and promotes synthesis of proteins and fats. Glucagon is secreted by the α-cells of the pancreas. It increases the level of glucose in the blood.

5. (a) Glucagon and insulin

(b) Parathormone (PTH)

(c) Follicle stimulating hormone (FSH) and luteinising hormone (LH)

(d) Atrial natriuretic factor

(e) Testosterone and estradiol

6. (a) Insulin

(b) Thyroxine and triiodothyronine

(c) Thyroxine and triiodothyronine.

7. (a) – (ii); (b) – (iv) ; (c) – (i) ; (d) – (iii)

Topic 2

1. FSH (Follicle stimulating hormone) being glycoprotein is insoluble in lipids, therefore, cannot enter the target cells. It binds to the specific receptor molecules located on the surface of the cell membrane to form hormone – receptor complex. This complex causes the release of an enzyme adenylate cyclase from the receptor site. This enzyme forms the cell cyclic adenosine monophosphate (cAMP) from ATP. The cAMP activates the existing enzyme system of the cell. This accelerates the metabolic reactions in the cell. The hormone is called the first messenger and the cAMP is termed the second messenger. The hormone-receptor complex changes the permeability of the cell membrane to facilitate the passage of materials through it. This increases the activities of the cell as it receives the desired materials.

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