CLASSIC ACADEMY

BIOLOGY FORM FOUR

ANSWERS TO CHAPTER TWO QUESTIONS

SECTION ONE: ANSWERS TO SINGLE CHOICE QUESTIONS:

1. **c** (glucagon)
2. **a** (antidiuretic hormone and oxytocin)
3. **a** (calcitonin and parathyroid hormone)
4. **d** (release products into the bloodstream)
5. **a** (blood glucose levels increase)
6. **a** (insulin)
7. **d** (both a and b are correct)
8. **d** (secretes hormones into the circulatory system)
9. **b** (endocrine system)
10. **b** (they require a transport protein in the blood stream)

SECTION TWO: ANSWERS TO DIRECT QUESTIONS:

1. **How do the hypothalamus and the pituitary gland interact to control the release of some of the hormones in the endocrine system?**
   ANSWERS: The hypothalamus secretes releasing hormones which stimulate the anterior pituitary to secrete its hormones which in turn control the secretion of other endocrine glands.
2. **List six major endocrine glands and the function of these hormones.**
   ANSWER: **(1) Pituitary gland:** secretes hormones with various functions which in turn regulate the secretions of other glands

   (2) Pancreas: mostly contain exocrine cells, but its endocrine part functions to regulate blood glucose level by releasing insulin and glucagon.

   (3) Thyroid gland: secretes thyroid hormones which control basal metabolic activity, and calcitonin which plays a role in maintaining proper levels of calcium in the blood.

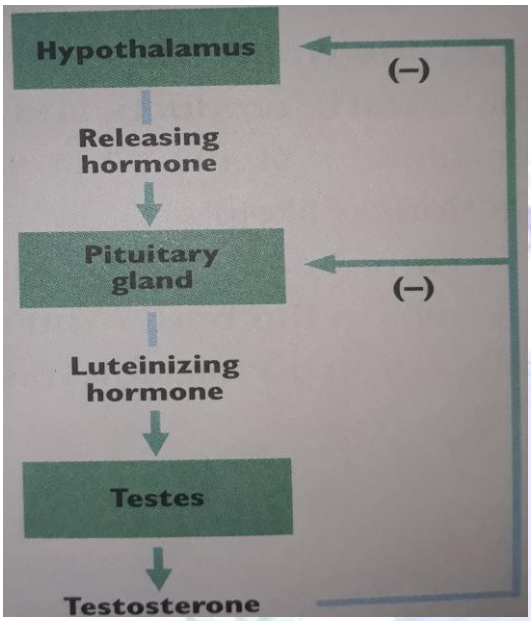
   (4) Parathyroid glands: secretes parathyroid hormones which increase blood calcium level.

   (5) Adrenal glands: contains two parts: the adrenal medulla which secretes epinephrine and norepinephrine hormones, and the adrenal cortex which produce the steroid hormones cortisol and aldosterone.

   (6) Gonads: the testes release androgens (majorly testosterone) which regulate male secondary sex characteristics. The ovaries secrete estrogen and progesterone.
3. **How do feedback mechanisms help maintain homeostasis?**
   ANSWER: to maintain homeostasis, feedback mechanisms control hormone secretion.

4. **How do negative feedback mechanisms differ from positive feedback mechanisms?**
   ANSWER: in negative feedback, the final step in a series of events inhibits the initial signal in the series, while in positive feedback, release of an initial hormone stimulates release or production of other hormones which stimulate further release of the initial hormone.
5. **Compare the effects of glucagon and insulin on blood glucose levels.**
   ANSWER: glucagon increases blood sugar level while insulin decreases blood glucose level.
6. **Name four functions of hormones.**
   (1) Hormones maintain homeostasis
   (2) Control basal metabolic rate
   (3) Regulate blood sugar level
   (4) Growth and development
7. **How do endocrine glands differ from exocrine glands?**
   ANSWER: endocrine glands have no ducts, they secretes hormones directly into the bloodstream, while exocrine glands secrete substances through ducts (tube-like structures).
8. **Explain how most amino acid-based hormones affect their target cells.**
   ANSWER: amino acid hormones must bind to receptors found on the plasma membrane of a target cell. Once the hormone binds to the receptor, the receptor activates an enzyme found on the inside of the membrane. This usually initiates a biochemical pathway, eventually causing the cell to produce the desired response.
9. **Explain how steroid and thyroid hormones affect their target cells.**
   ANSWER: all steroid hormones and thyroid hormones diffuse through the plasma membrane and bind to a receptor found inside the target cell. The hormone and the receptor that are bound together bind to DNA in the nucleus, which activates specific genes and initiate protein synthesis.
10. **Explain why the pancreas is considered to be both an exocrine gland and an endocrine gland.**
    ANSWER: the pancreas consists of exocrine part which secretes enzymes into ducts and an endocrine part called **islets of Langerhans** which secrete hormones into the bloodstream.
11. **Why pituitary gland is called the master gland?**
    ANSWER: because the pituitary gland controls the secretion of other endocrine glands.
12. **Describe the conditions of gigantism and dwarfism, their causes and treatment methods.**
    ANSWER: **Gigantism** is a condition that occurs when growth hormone is too high (more than normal) in children who are still growing. It can be caused by benign tumor of the pituitary gland. It can be treated by octreotide or lantreotide which inhibit growth hormone secretion. **Dwarfism** is a condition of too low growth hormone (below normal) in children who are still growing. It has many causes such as disorder called achondroplasia. It is treated with injections of synthetic growth hormone.

13. Identify and describe the type of feedback mechanism operating in the diagram shown below.



The type of feedback mechanism in the diagram is negative feedback mechanism. It is a type of feedback mechanism in which the final step in a series of events inhibits the initial signal in the series.

END