

MULTIPLE CHOICE QUESTIONS

1. Select the right match of the endocrine gland and their hormone among the options given below

A. Pineal	i. Epinephrine
B. Thyroid	ii. Melatonin
C. Ovary	iii. Estrogen
D. Adrenal medulla	iv. Tetraiodothyronine

Options:

- a. A-iv, B-ii, C-iii, D-i
- b. A-ii, B-iv, C-i, D-iii
- c. A-iv, B-ii, C-i, D-iii
- d. A-ii, B-iv, C-iii, D-i

Solution:

Option (d) is the answer.

2. Which of the following hormones is not secreted by the anterior pit.

- a. Growth hormone
- b. Follicle-stimulating hormone
- c. Oxytocin
- d. Adrenocorticotrophic hormone

Solution:

Option (c) is the answer.

3. Mary is about to face an interview. But during the first five minutes before the interview, she experiences sweating, increased rate of heart beat, respiration etc. Which of the following hormones are responsible for her restlessness?

- a. Estrogen and progesterone
- b. Oxytocin and vasopressin
- c. Adrenaline and noradrenaline
- d. Insulin and glucagon

Solution:

Option (c) is the answer.

4. The steroid responsible for the balance of water and electrolytes in our body is

- a. Insulin
- b. Melatonin
- c. Testosterone
- d. Aldosterone

Solution:

Option (d) is the answer.

5. Thymosin is responsible for

- a. Raising the blood sugar level
- b. Raising the blood calcium level

- c. Differentiation of T lymphocytes
- d. The decrease in blood RBC

Solution:

Option (c) is the answer.

6. In the mechanism of action of a protein hormone, one of the second messengers is

- a. Cyclic AMP
- b. Insulin
- c. T3
- d. Gastrin

Solution:

Option (a) is the answer.

7. Leydig cells produce a group of hormones called

- a. Androgens
- b. Estrogens
- c. Aldosterone
- d. Gonadotropins

Solution:

Option (a) is the answer.

8. Corpus luteum secretes a hormone called

- a. Prolactin
- b. Progesterone
- c. Aldosterone
- d. Testosterone

Solution:

Option (b) is the answer.

9. Cortisol is secreted by

- a. Pancreas
- b. Thyroid
- c. Adrenal
- d. Thymus

Solution:

Option (c) is the answer.

10. A hormone responsible for the normal sleep-wake cycle is

- a. Epinephrine
- b. Gastrin
- c. Melatonin
- d. Insulin

Solution:

Option (c) is the answer.

11. Hormones are called chemical signals that stimulate specific target

tissues. Their action depends on the presence of receptors on the respective target tissues. Which of the following is the correct location of the receptors in the case of protein hormones?

- a. Extracellular matrix
- b. Blood
- c. Plasma membrane
- d. Nucleus

Solution:

Option (c) is the answer.

12. Choose the correct option among the following options

Column I	Column II
A. Epinephrine	i. Stimulates muscle growth
B. Testosterone	ii. A decrease in blood pressure
C. Glucagon	iii. Breakdown of liver glycogen
D. Atrial natriuretic factor	iv. Increases heartbeat

Options:

- a. A-ii, B-i, C-iii, D-i
- b. A-iv, B-i, C-iii, D-ii
- c. A-i, B-ii, C-iii, D-iv
- d. A-i, B-iv, C-ii, D-iii

Solution:

Option (b) is the answer.

13. Which of the following organs in mammals does not consist of a central calcium balance in the human body?

- a. Vitamin D
- b. Parathyroid hormone
- c. Thyrocalcitonin
- d. Thymosin

Solution:

Option (d) is the answer.

14. Which of the following organs in mammals does not consist of a central medullary' region surrounded by a cortical region?

- a. Ovary
- b. Adrenal
- c. Liver
- d. Kidney

Solution:

Option (c) is the answer.

15. Which of the following conditions is not linked to a deficiency of thyroid hormones?

- a. Cretinism
- b. Goitre
- c. Myxedema
- d. Exophthalmia

Solution:

Option (d) is the answer.

VERY SHORT ANSWER TYPE QUESTIONS

1. There are many endocrine glands in the human body. Name the glands which are absent in male and the one absent in the female.

Solution:

Ovaries are absent in male and testes are absent in female both secrete sex hormones.

2. Which of the two adrenocortical layers, zona glomerulosa and zona reticularis lies outside enveloping the other?

Solution:

Zonaglomerulosa is the outermost layer which envelops the other layers. The middle layer is Zona fasciculata and innermost layer is Zonareticularis.

3. What is erythropoiesis? Which hormone stimulates it?

Solution:

Formation of RBCs is called Erythropoiesis. Erythropoietin hormone stimulates for erythropoiesis.

4. Name the only hormone secreted by pars intermedia of the pituitary gland.

Solution:

Pars intermedia secrete only one hormone called melanocyte-stimulating hormone (MSH).

5. Name the endocrine gland that produces calcitonin and mention the role played by this hormone.

Solution:

The thyroid gland is an endocrine gland which produces calcitonin hormone which is a peptide hormone. This hormone decreases the concentration of calcium ions in the plasma.

6. Name the hormone that helps in cell-mediated immunity.

Solution:

Thymosin is the hormone that helps in cell-mediated immunity. It helps in maturation of T- cells and differentiation of T-cells.

7. What is the role of the second messenger in the mechanism of protein hormone action?

Solution:

cAMP acts as an intercellular hormone which is a secondary messenger those deliver the information as intracellular to the target cells.

8. State whether true or false:

- a. The gastrointestinal tract, kidney and heart also produce hormones.
- b. Pars distalis produces six trophic hormones.
- c. B-lymphocytes provide cell-mediated immunity.
- d. Insulin resistance results in a disease called diabetes mellitus.

Solution:

- a. True
- b. True
- c. False because T. lymphocytes provide cell-mediated immunity and B- lymphocytes provide humoral immunity which is a type of adaptive immune system.
- d. True

9. A patient complains of constant thirst, excessive passing of urine and low blood pressure. When the doctor checked the patients' blood glucose and blood insulin level, the level was normal or slightly low. The doctor diagnosed the condition as diabetes insipidus. But he decided to measure one more hormone in patients blood. Which hormone does the doctor intend to measure?

Solution;

Doctor intends to measure vasopressin hormone because this hormone increases the reabsorption of water by the kidney and deficiency of this hormone decreases reabsorption of water

10. Correct the following statements by replacing the term underlined.

- a. Insulin is a steroid hormone.
- b. TSH is secreted from the corpus luteum
- c. Tetraiodothyronine is an emergency hormone.
- d. The pineal gland is located on the anterior part of the kidney.

Solution:

- (a) Insulin is a protein hormone
- (b) TSH is secreted from the anterior pituitary.
- (c) Adrenaline is an emergency hormone.
- (d) The adrenal gland is located on the anterior part of the kidney.

11. Rearrange the following hormones in Column I to match with their chemical nature in Column II

Column I	Column II
a. Oxytocin	i. Amino acid derivative ()
b. Epinephrine	ii. Steroid ()
c. Progesterone	iii. Protein ()
d. Growth hormone	iv. Peptide ()

Solution:

- a- iv,
- b- i,
- c- ii,
- d- iii.

SHORT ANSWER TYPE QUESTIONS

1. What is the role-played by luteinizing hormones in males and females

respectively?

Solution:

In the case of Males, the LH stimulates Androgen secretion and synthesis from testes. The principal of androgen is testosterone which stimulates the spermatogenesis and responsible for the growth and development of male accessory sex organs. In females, LH induces ovulation, on the day of ovulation follicle rupture and release secondary oocyte under the influence of LH. LH promotes the development of corpus luteum.

2. What is the role of the second messenger in hormone action?

Solution:

Secondary messenger like (cAMP) act as intracellular hormonal mediator which deliver the information inside the target cell. Secondary messenger is cAMP, cGMP, diacylglycerol, inositol triphosphate, phosphoinositides, calcium etc.

3. On an educational trip to Uttarakhand, Ketki and her friends observe that many local people were having swollen necks. Please help Ketki and her friends to find out the solutions to the following questions.

a. Which probable disease are these people suffering from?

b. How is it caused?

c. What effect does this condition have on pregnancy?

Solution:

- Goitre. This is due to the overstimulation of thyroid gland which causes an enlargement in the gland.
- It is caused due to the deficiency of iodine in the diet that results in hyperthyroidism and enlargement of the thyroid gland
- Defective development and maturation of the growing baby leads to stunted growth (cretinism)

4. George comes on a vacation to India from the US. The long journey disturbs his biological system and he suffers from jet lag. What is the cause of his discomfort?

Solution:

Melatonin is the hormone which is responsible for this biological system discomfort. Jet lag is a temporary sleep disorder.

5. Inflammatory responses can be controlled by a certain steroid. Name the steroid, its source and also its other important functions.

Solution:

Cortisol is a steroid hormone which is secreted by the adrenal cortex that produces anti-inflammatory responses and suppresses the immune response.

6. Old people have a weak immune system. What could be the reason?

Solution:

Thymosin is the important hormone that plays an important role in the immune system but with age, thymus gland starts to degenerate and thus old people have a weak immune system.

7. What are the effects of hypothyroidism (observed during pregnancy) on the development and maturation of a growing baby?

Solution:

Hypothyroidism during pregnancy causes defective development and stunted growth (cretinism). Mental retardation and low intelligence quotient.

8. Mention the difference between hypothyroidism and hyperthyroidism.

Solution:

Hypothyroidism is when the thyroid hormone secretes less amount causes this disease. The symptoms include weight gain, loss of appetite, dry and coarse skin.

Hyperthyroidism is due to the high amount of secretion which causes the excessive amount of thyroid hormone and patient leads to hyperthyroidism. The symptoms include weight loss, increased appetite and moist skin.

LONG ANSWER TYPE QUESTIONS

1. A milkman is very upset one morning as his cow refuses to give any milk. The milkman's wife gets the calf from the shed. On fondling by the calf, the cow gave sufficient milk. Describe the role of endocrine gland and pathway associated with this response?

Solution:

Oxytocin hormone is the hormone which stimulates the release of milk from the mammary gland by causing surrounding cells to contract. When the infant starts feeding breast stimulates the posterior pituitary to produce the oxytocin hormone and oxytocin hormone stimulates the milk secretion. It also contracts the smooth muscles of the uterus to expel the foetus outside the body of the mother.

2. A sample of urine was diagnosed to contain a high content of glucose and ketone bodies. Based on this observation, answer the following:

a. Which endocrine gland and hormone is related to this condition?

b. Name the cells on which this hormone acts.

c. What is the condition called and how can it be rectified?

Solution:

a. The pancreas is the gland and hormone is Insulin which is responsible for this condition.

b. Hepatocytes and adipocytes cells are the main cells on which insulin act. Insulin allows muscles, liver and fat cells to take up this glucose.

c. This condition causes diabetes mellitus. Diabetes mellitus is a condition in which the body does not produce enough insulin hormone which results in a high level of sugar in the blood. It can be controlled by maintaining cholesterol, glucose level and blood pressure to the normal level.

3. Calcium plays a very important role in the formation of bones. Write on the role of endocrine glands and hormones responsible for maintaining Calcium homeostasis.

Solution:

Thyroid gland and the parathyroid gland that is an antagonist with each other are responsible for maintaining calcium homeostasis. Calcitonin is responsible for the high calcium level in the blood. It also decreases plasma calcium concentration by decreasing mobilization of calcium from bones.

Parathyroid hormone increases the calcium level in blood which is secreted by the parathyroid gland. It increases the reabsorption of calcium by renal tubules of the kidney.

4. Illustrate the differences between the mechanism of action of a protein and a steroid hormone.

Solution:

Protein hormone:

Protein hormones are insulin, glucagon, prolactin etc. They have to bind their receptors which are present on the plasma membrane. They form their hormone receptor complex on the membrane. They are water-soluble hormone so they can't diffuse to lipid layer plasma membrane and bind to a receptor on membrane.

Steroid hormone:

Steroid hormone is an androgen, estrogen etc. which don't have their receptor on plasma membrane they directly diffuse to their target site. They don't produce a secondary messenger.

5. Hypothalamus is a super master endocrine gland. Elaborate.

Solution:

Hypothalamus is a super master endocrine gland as it secretes hormones that regulate the synthesis and secretion of the pituitary gland which is the master gland. It is connected to the anterior lobe of the pituitary gland by hypo physical portal veins. The hormones which are secreted by hypothalamus are:

1. Adrenocorticoicotropic releasing hormone (ARH) or corticotrophin
2. Growth hormone-releasing hormone (GHRH)
3. Thyrotropin-releasing hormone (TRH)
4. Growth hormone inhibitory hormone (GHIH)
5. Gonadotropin-releasing hormone (GnRH)
6. Prolactin inhibitory hormone (PIH)
7. Prolactinrelasing hormone (PRH)
8. MSH releasing hormone (MSHRH)
9. MSH Inhibitory hormone (MSHIH)