INDIAN SCHOOL AL WADI AL KABIR

Class: XI	**DEPARTMENT OF SCIENCE:2025– 2026** **SUBJECT: BIOLOGY**	**Date: 10/10/2025**
Worksheet: 09	**UNIT- V- Human Physiology** **CHAPTER:19- Chemical Coordination and Integration**	**Note:** **A4 FILE FORMAT**
NAME OF THE STUDENT	**CLASS & SEC:**	**ROLL NO.**

I.MULTIPLE CHOICE QUESTIONS (1M)

1. Name the hormone that is responsible for milk secretion after parturition.
   A. Insulin
   B. Prolactin
   C. Lactogen
   D. None of the above
2. Which hormone regulates the basal metabolic rate (BMR) and controls metabolic activities in the body?
   A. Insulin
   B. Thyroxine (T4)
   C. Growth Hormone (GH)
   D. Glucagon

3. Which of the following categories of hormones is correctly matched with its examples?
   A Catecholamines: adrenaline and noradrenaline
   B Emergency hormones: adrenaline and insulin.
   C. Glucocorticoids: aldosterone
   D Mineralocorticoids: cortisol

4. The adrenal cortex is divided into three layers. Which layer produces mineralocorticoids like Aldosterone?
   A. Zona fasciculata
   B. Zona reticularis
   C. Zona glomerulosa
   D. Adrenal medulla

5. Adrenocorticotropic hormones stimulate the adrenal cortex to produce:
   A. Testosterone
   B. Aldosterone
   C. Cortisol
   D. None of the above

Two statements are given - one labelled as **Assertion (A)** and the other labelled as **Reason (R)**. Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below.

A. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B. Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C. Assertion (A) is true, Reason (R) is false.
D. Assertion (A) is false, Reason (R) is true.

6. Assertion(A): Failure of secretion of hormone vasopressin causes diabetes mellitus in the patient.
   Reason(R): Vasopressin increases the volume of urine by increasing the reabsorption of water from the urine.
7. Assertion (A): Hormone calcitonin has antagonistic effect to that of parathormone.
   Reason (R): Calcitonin decreases blood calcium level while parathormone increases blood calcium level.
8. Assertion(A): Catecholamines increases the concentration of glucose in blood.
   Reason(R): Catecholamines stimulates the glycogenolysis.

II. VERY SHORT ANSWER TYPE QUESTIONS(2M)

9. What is the function of the corpus luteum, and how does it act as an endocrine gland?
10. Define erythropoiesis. Name the hormone that triggers it.
11. Why LH and FSH hormones are called gonadotropins?
12. How kidney is related to RBC production?
13. Name any four hormones secreted by the GI tract.

III. SHORT ANSWER TYPE QUESTIONS (3M)

14. Explain how the hypothalamus acts as a neurosecretory centre and describe its relationship with the pituitary gland.
15. Give a brief account of the anatomy and role of the adrenal cortex.
16. Outline the physiological effects of hyperthyroidism and hypothyroidism.
17. Briefly explain the mechanism of action of FSH.
18. i) Which hormone aids in cell-mediated immunity?
    ii) Old aged persons have weak immunity. Give reason.

IV. CASE STUDY BASED QUESTIONS (4M)

19.Rahul, a 35-year-old man, noticed gradual changes in his facial structure, including an enlarged jaw and thickened lips. His hands and feet also grew larger, and he often felt fatigued. Concerned, he visited an endocrinologist, who diagnosed him with **Acromegaly**, caused by excessive secretion of Growth Hormone (GH) in adulthood. The doctor explained that the disease is often difficult to diagnose early, as symptoms develop gradually over time. Further tests showed a tumor in the pituitary gland, which was stimulating excess GH production. Rahul was advised to undergo treatment, including medication to control hormone levels and surgery to remove the tumor.

A. What condition is Rahul suffering from?
B. What are the common symptoms of Acromegaly?
C. Which gland is responsible for Acromegaly?

OR

D. What happens due to excess GH secretion in childhood?

V. LONG ANSWER TYPE QUESTIONS (5M)

20. Illustrate the action of Peptide hormone and Steroids.
21. i) Explain the endocrine nature of the heart.
    ii) Which hormone is secreted by the pineal gland? Mention any three roles of that hormone.
    iii) What are the physiological effects of catecholamines?

Q. No.	Answer
I.	**MULTIPLE CHOICE QUESTIONS (1M)**
1	B. Prolactin
2	B. Thyroxine (T4)
3	A Catecholamines: adrenaline and noradrenaline
4	C. Zona glomerulosa
5.	C. Cortisol
	ASSERTION & REASONING
6.	D. Assertion (A) is false, Reason (R) is true.
7.	A. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
8.	A. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
II	**VERY SHORT ANSWER TYPE QUESTIONS(2M)**
9.	The corpus luteum is a temporary endocrine gland formed from the remnants of the Graafian follicle after ovulation. It secretes the hormone progesterone, which is essential for maintaining pregnancy. Progesterone helps prepare the uterus for implantation and prevents uterine contractions.
10.	The process of formation of RBC is known as erythropoiesis. The peptide hormone erythropoietin produced from the juxtaglomerular cells of the kidney triggers the erythropoiesis.
11.	LH and FSH stimulate gonadal activity (testes and Ovary) and hence are called gonadotropins.
12.	The juxtaglomerular cells of the kidney produce a peptide hormone called erythropoietin which stimulates erythropoiesis (formation of RBC).
13.	Gastrin, secretin, cholecystokinin (CCK) and gastric inhibitory peptide (GIP).
III	**SHORT ANSWER TYPE QUESTIONS (3M)**
14.	The hypothalamus is a part of the forebrain and serves as the main link between the nervous and endocrine systems. • It contains neurosecretory cells, which produce hormones that regulate the synthesis and secretion of hormones in the pituitary gland. • These hormones are of two types: releasing hormones (e.g., GnRH, GHRH) and inhibiting hormones (e.g., somatostatin). • The hypothalamus controls the anterior pituitary through a portal blood system and regulates the posterior pituitary by directly transporting hormones like oxytocin and vasopressin via nerve fibers.
15.	The adrenal cortex can be divided into three layers, called zona reticularis (inner layer), zona fasciculata (middle layer) and zona glomerulosa (outer layer). The adrenal cortex secretes hormones collectively called corticoids. Glucocorticoids-

	involved in carbohydrate metabolism. E.g.- Cortisol Mineralocorticoids- regulate the balance of water and electrolytes in our body. e.g. aldosterone.
16.	The thyroid gland secretes thyroid hormones (T_3 and T_4) that regulate metabolism. • **Hyperthyroidism** is the over-secretion of thyroid hormones. It leads to an accelerated metabolism, causing symptoms like weight loss, a rapid heart rate (tachycardia), anxiety, increased appetite, and heat intolerance. The condition can be caused by diseases like Graves' disease. • **Hypothyroidism** is the under-secretion of thyroid hormones. It causes a slow metabolism, leading to symptoms like weight gain, fatigue, depression, constipation, and cold intolerance. In adults, it can cause myxedema, and in infants, it can lead to cretinism.
17.	Follicle-stimulating hormone (FSH) is a glycoprotein polypeptide hormone which is not soluble in lipids and, therefore, cannot enter the target cell. It binds to the surface of the cell, which activates the cellular systems to carry out its functionalities. Mechanism of FSH 1. FSH molecule binds to the receptor protein, which is located on the surface of the cell, forming the hormone-receptor complex 2. The formation of the hormone causes the receptor complex to activate the adenyl cyclase enzyme 3. This enzyme converts ATP to cyclic AMP as a second messenger, which in turn activates the follicular cells of the membrane of granulose to produce estrogens.
18.	i)Thymosins play a significant role in the differentiation and development of T-lymphocytes that provide cell-mediated immunity. ii) Thymosins promote cell-mediated and humoral immunity. The thymus is degenerated in old individuals resulting in a decreased production of thymosins. As a result, the immune responses of old persons become weak.
IV	**CASE STUDY BASED QUESTIONS (4M)**
19.	A. Rahul has **Acromegaly**, caused by excessive secretion of GH in adulthood. B. Enlarged facial features, enlarged hands and feet, fatigue, and joint pain. C. The **pituitary gland**, due to excessive GH secretion. OR D. It causes gigantism.
V	**LONG ANSWER TYPE QUESTIONS (5M)**
20.	Peptide hormones, such as insulin, are water-soluble and cannot pass through the cell membrane. They bind to surface receptors, triggering a signal transduction pathway using second messengers like cAMP, which activates cellular responses. In contrast, steroid hormones, such as cortisol, are lipid-soluble and easily diffuse through the cell membrane. They bind to intracellular receptors in the cytoplasm or nucleus, forming a hormone-receptor complex that directly influences gene expression, leading to protein synthesis and long-term effects. Peptide hormones act quickly, while steroid hormones have slower but longer-lasting effects.
21.	i) Atrial wall of our heart secretes a peptide hormone; atrial natriuretic factor (ANF), ANF decreases blood pressure. When blood pressure is increased, ANF is secreted which causes dilation of the blood vessels. This reduces blood pressure. ii) Pineal gland secretes melatonin hormone. It helps in the regulation of a 24-hour

	(diurnal) rhythm of our body. It also influences metabolism, pigmentation, and the menstrual cycle. iii) These hormones function by increasing alertness, pupillary dilation, piloerection and sweating. It results in an increased heartbeat and rate of respiration. They also stimulate catabolism of glycogen that causes increased blood glucose level. It also stimulates catabolism of protein and lipids.

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