



INDIAN SCHOOL AL WADI AL KABIR



Class: XI	Department: SCIENCE 2024 – 2025 SUBJECT: BIOLOGY	Date :09.02.2025
Worksheet: 19	UNIT- V- Human Physiology CHAPTER:18- Chemical control and coordination	Note: A4 FILE FORMAT
NAME OF THE STUDENT	CLASS & SEC:	ROLL NO.

I. MULTIPLE CHOICE QUESTIONS (1M)

- Where is the pituitary gland precisely located in the skull of a human?
A. Bony cavity called sella tursica
B. Inside the trachea
C. Behind the heart
D. In the spinal cord
- 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
- Injection of which of the following increases metabolic rate: -
A Thyroxine
B. Adrenaline
C. Calcitonin
D. Estrogen
- Which of the following regulates the pigmentation of the skin?
A FSH
B MSH
C Thymosin
D Glucagon
- A deficiency of this element causes the swelling of the thyroid gland.
A Potassium
B. Iodine
C. Phosphorous
D. All of these

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.

- Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
- 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): Vasopressin is also called anti-diuretic hormone.

Reason(R): Vasopressin acts mainly at the kidney and stimulates resorption of water and electrolytes by the distal tubules and thereby reduces the loss of water through urine (diuresis).

7. Assertion (A): TSH stimulates the thyroid gland to secrete thyroid hormones.

Reason (R): The hormones of anterior pituitary that regulate the secretions of other endocrine glands are called tropic hormones.

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. Define erythropoiesis. Name the hormone that triggers it.
- 10. Why LH and FSH hormones are called gonadotropins?
- 11. How kidney is related to RBC production?
- 12. Name any four hormones secreted by the GI tract.

III. SHORT ANSWER TYPE QUESTIONS (3M)

- 13. Give a detailed account of the classification of hormones based on their chemical nature.
- 14. Give a brief account of the anatomy and role of the adrenal cortex.
- 15. a) Which hormone aids in cell-mediated immunity?
b) Old aged persons have weak immunity. Give reason.

IV. CASE STUDY BASED QUESTIONS (4M)

16. Type 2 diabetes mellitus is likely the third modifiable risk factor for pancreatic cancer after cigarette smoking and obesity. Epidemiological investigations have found that longterm type 2 diabetes mellitus is associated with a 1.5-fold to 2.0-fold increase in the risk of pancreatic cancer. A causal relationship between diabetes and pancreatic cancer is also supported by findings from pre diagnostic evaluations of glucose and insulin levels in prospective studies. Insulin resistance and associated hyperglycemia, hyperinsulinemia, and inflammation have been suggested to be the underlying mechanisms contributing to development of diabetes- associated pancreatic cancer. Signalling pathways that regulate the metabolic process also play important roles in cell proliferation and tumour growth.

A Name the gland associated with the first type of disease mentioned in the case.

B Name the endocrine part of pancreas.

C Name the hormone secreted by the B-cells of this gland.

D Name the disease associated with glucagon.

V. LONG ANSWER TYPE QUESTIONS (5M)

17. Explain the mechanism of hormone action.

18. a) Explain the endocrine nature of the heart.

b) Which hormone is secreted by the pineal gland? Mention any three roles of that hormone.

c) What are the physiological effects of catecholamines?

Answer Key

Q. No.	Answer
I.	MULTIPLE CHOICE QUESTIONS (1M)
1	A. Bony cavity called sella tursica
2	A Catecholamines: adrenaline and noradrenaline
3	A Thyroxine
4	B MSH
5	B. Iodine
	ASSERTION & REASONING
6	c) A is true but R is false.
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 process of formation of RBC is known as erythropoiesis. The peptide hormone erythropoietin produced from the juxtaglomerular cells of the kidney triggers the erythropoiesis.
10	LH and FSH stimulate gonadal activity (testes and Ovary) and hence are called gonadotropins.
11	The juxtaglomerular cells of the kidney produce a peptide hormone called erythropoietin which stimulates erythropoiesis (formation of RBC).
12	Gastrin, secretin, cholecystokinin (CCK) and gastric inhibitory peptide (GIP).
III	SHORT ANSWER TYPE QUESTIONS (3M)
13	(i) peptide, polypeptide, protein hormones (e.g., insulin, glucagon, pituitary hormones, hypothalamic hormones, etc.) (ii) steroids (e.g., cortisol, testosterone, estradiol and progesterone) (iii) iodothyronines (thyroid hormones) (iv) amino-acid derivatives (e.g., epinephrine).
14	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.
15	a)Thymosins play a significant role in the differentiation and development of T-lymphocytes that provide cell-mediated immunity. b) 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)
16	A Pancreas is a composite gland; acts as both an exocrine and endocrine gland. It consists of 'Islets of Langerhans' made up of two main types of cells that are, a-cells and a-cells that secrete glucagon and insulin, respectively. B Islets of Langerhans C B-cells secrete a peptide hormone, i.e. insulin that regulates glucose homeostasis, it mainly

	acts on hepatocytes and adipocytes, i.e. cells of fat tissue, improving cellular glucose uptake and utilisation that causes rapid movement of glucose from blood to hepatocytes and adipocytes resulting into hypoglycemia, i.e. decreased blood glucose levels. It stimulates glycogenesis in targeted cells. D It mainly acts on liver cells, i.e. hepatocytes and stimulates glycogenolysis and gluconeogenesis causing hyperglycemia, i.e. increased blood sugar. It reduces cellular glucose uptake and utilisation. Thus, it is a hyperglycemic hormone.
V	LONG ANSWER TYPE QUESTIONS (5M)
17	Hormones produce their effects by binding to the specific proteins (hormone receptors) located in target tissues. ● A hormone binds to its specific receptor to form hormone- receptor complex. ● It leads to biochemical changes in target tissue and thereby regulates metabolism and physiological functions. Hormone receptors are 2 type. ● Membrane- bound receptors: Some hormones (e.g. protein hormone, FSH) interact with membrane - bound receptors (do not enter the target cell).It generates second messengers(e.g. cyclic AMP ,IP3 ● It in turn regulates cellular metabolism and causes physiological effects. ● Intercellular receptors (mostly nuclear receptors.): Some hormones (e.g, steroid hormones, iodothyronines) interact with intercellular receptors. They mostly regulate gene expression, or chromosome function by the interaction of hormone-receptor complex with the genome. Cumulative biochemical actions result in physiological and developmental effects,
18	a) 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. b) 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. c) 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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