CBSE Class 11 Biology

Important Questions

Chapter 22

Chemical Coordination and Integration

1 Marks Questions

1.What are hormones.

Ans. Hormones (endocrines) are the secretions of endocrine glands.

2.Name the gland of emergency.

Ans. Adrenals.

3.Which gland secrete glucagon?

Ans. Pancreas.

4.Distinguish between diabetes mellitus and diabetes insipidus.

Ans. Diabetes mellitus is caused due to less secretion of Insulin by β cells of Islet of langerhans in pancreas. Diabetes insipidus is caused due to less secretion of ADH (vasopressin) by posterior pituitary gland.

5.Name the hormones of fight or flight.

Ans. Adrenaline and nor – adrenaline.

6.Name the hormone secreted from outermost cellular layer of adrenal cortex?

Ans. Aldosterone, a mineral ocorticoid.

7.What is the function of Leydeig's cells?

Ans. Leydig cells or interstitial cells of the testes secretes testosterone hormone. It stimulates the development of external male sex characters such as beards, moustaches and low pitch voice is man & stimulates the formation of sperms in testis.

8.Name the gland which secrets vasopressin.

Ans. It is secreted by posterior part of the pituitary gland.

9.Name one mineralocorticoid.

Ans. Aldosterone.

10.Which two systems coordinate and regulate physiological functions of our body?

Ans. Neural system and endocrine system.

11. What is the role of melanocyte stimulating hormone?

Ans. Acts on melanocytes and regulates pigmentation of skin.

12.Name the hormones which act antagonistically in order to regulate calcium Levels in the blood.

Ans. Thyrocalcitonin (TCT) and parathyroid hormone (PTH).

13. Give the names of any one glucocorticoid and one mineral corticoid.

Ans. Glucocorticoid – Cortical ; Mineralocorticoid – Aldosterone.

14. How does arterial natriuretic factor decreases blood pressure?

Ans. By dilation of the blood vessels.

15. Which structure is funned from ruptured follicle in females ?What is its role?

Ans. Corpus luteum which secrets progesterone.

16. immunityy of old persons becomes very weak. Give reason.

Ans. Thymus gland degenerates with age.

17. What happens if a person suffers from prolonged hyperglycemia?

Ans. Gets affected by diabetes mellitus which causes loss of glucose through urine and formation of harmful ketone bodies.

18.What are the two modes through which the hypothalamus causes the release of hormones by pituitary gland?

Ans. Through hypothalamic neurons conteol anterior pituitary gland. Through neutal regulation controls posterior pituitary gland.

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2 Marks Questions

1.Differentiate hormone & neurohormone?

Ans.

Hormone		**Neurohormone**	
1.	Secreted by endocrine glands.	1.	Secreted by neuro – secretary cells.
2.	It stimulates the growth & metabolism of endocrine glands and body cells.	2.	It stimulates the secretion of hormones of pituitary.

2.What are gonadotropics?

Ans. These are the gonad stimulating hormones secreted by the anterior lobe of pituitary e.g.- follicle stimulating Hormone and prolactin.

3.Why oxytocin is called as 'birth hormone'?

Ans. Oxytocin causes the contraction of smooth muscles of uterus during child birth. So it is called 'birth hormone'.

4.What usually can cause over secretion of parathormone in human body? List any two effects on the body because of this hormone.

Ans. A tumors in parathyroid glands causes the over secretion / hypersecretion of parthormone. Due to demineralization, the bones become deformed and are early fractured. If untreated, it can lead to osteitis fibrosa cystica disease in human beings.

5.What is the function of pineal gland?

Ans. It secretes a hormone the melatonin. It reduces the reproductive activity and may also delay the sexual development in an individual.

6. Explain the hormones of kidney and GI tract.

Ans. Kidney – Juxtaglimerular cells of kidney secrete a peptide hormone called erythropoietin. It stimulates erythropoiesis or formation of RBC's of blood-

G – I tract – The endocrine cells found in various parts of gastro-intestine tract secrete 4 peptide hormones –

Gastrin, secretin, cholecystokinin (CCK) as well as gastric Inhibitory peptide or GIP.

7.In general, how steroid hormones do effects changes in their target cells.

Ans. Steroid hormones are lipid soluble. These quickly pass through plasma membrane of a target cell into the cytoplasm. There they bind to intercellular receptor proteins and form a complex. This complex enters the nucleus and binds itself to specific regulatory sites on the chromosomes. This binding changes gene expression and stimulates transcription of same genes. It may repress some other genes. Finally in RNA acts for protein synthesis. The lipid soluble hormones are slow in action. They are last longer hormones.

8.What is corpus luteum? How does it function as a endocrine gland?

Ans. Corpus luteum is the structure formed by the ruptured ovarian follicle after ovulation.
- It secrets the hormone progesterone, which is necessary for pregnancy changes.

9.Name the gland that functions as a biological clock in our body where it is located? Name its one secretion.

Ans. Pineal gland functions as biological clock in our body.
Location – It is located on the dorsal side of the forebrain.
Secretion – It secretes melatonin.

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3 Marks Questions

1.Describe the physiological functions & disorders of thyroid gland.

Ans. Thyroid gland consists of a two lobed structure in the region of larynx. It secretes the hormone thyroxin which contains Iodine the thyroxin stimulates the rate of cellular oxidation and control the basal metabolic rate. It also maintains balance of the Ca^{++} in blood thyroid hormones also promotes growth of body tissues both physical growth and mental development are stimulated.

They stimulate tissue differentiation because of this action they promote metamorphosis of tadpoles into adult frogs.

Thyroid secretes the hormones which stimulate all metabolic actions. They are controlled by hormones secreted by anterior pituitary gland.

Disorders –

1) Hyperthyroidism :- It reduces the basic metabolic rate

2) Cretinism:- The delayed growth (mental, bodily and sexual). The patient is pot – bellied and pigeon – cheated and has a protruding tongue.

3) Myxodema (Adult) :- Dry coarse skin, loss of hair, reduced cerebration, temperature and pulse rate, slowed speech. The patient gains weight, reproductive failure and has a puffy appearance and lacks alertness.

2.Write full form of ADH and describe how it affects the functioning of kidney tubules.

Ans. ADH – Anti diuretic hormone

It affects kidney tubules in following ways –

1) It renders the distal convoluted tubule, collecting tubule and collecting duct of the nephrons permeable water so that water is reabsorbed from filtrate in these segments and urine becomes hypertonic.

2) It also regulates the arterial blood pressure.

3.Differentiate between exocrine, endocrine & heterocrine glands.

Ans.

	Exocrine glands	**Endocrine glands**	**Heterorine glands**
1.	It has a duct	It is ductless gland.	It is partly endocrine & partly exocrine
2.	Their secretions are carried by the ducts to the internal parts or body surface e.g salivary gland in mouth.	Their secretions are carried by blood to the target organs e.g. Parathyroid, pituitary and adrenals.	Endocrine part releases hormones into blood stream while exocrine part into ducts associated with it e.g. pancreas, ovary's, testis.

4.Name the T_3 and T_4 components of thyroid hormone. Explain their specific function.

Ans. T_3 = Thyroxin. It contains 4 atoms of iodine.

T_4 = Triiodothyroxine. It has 3 atoms of iodine

T_3 and T_4 have identical effects on target cells. They are called together as TH (Thyroid hormone)

They : **1)** regulate metabolic rate

2) regulate metabolism

3) help in metamorphosis of frog.

5.Differentiate between vitamin, hormone & enzyme.

Ans.

	Vitamin	Hormone	Enzyme
1.	It is carried in the food.	It is carried by the blood.	It is not carried by the blood.
2.	It is used up during the process.	It is consumed during the metabolic reaction.	It remains unchanged after the reaction.
3.	It is obtained from food.	It is produced by an endocrine gland.	It is produced by exocrine gland.
4.	It may be organic acid, amide, amine, ester, alcohol or steroid.	It is glycoprotein, steroid or polypeptide.	It is always proteinaceous in nature.
5.	It act as coenzyme.	It act as a stimulating substance.	It act as a biocatalyst.
6.	Its deficiency causes deficiency diseases.	It excess as well as deficiency causes many hormonal disorders & diseases.	It is required in small amount.

6.A patient was complaining of frequent urination, excursive thirst, hunger and tiredness. His fasting glucose level was found higher than 130 mg / dL an two occasions :

(i) Name the disease
**(ii) Give the root cause of this disease **
(iii) Explain why the blood glucose level is higher than 130 mg / dL.

Ans. (i) The disease is diabetes mellitus.

(ii) It is caused by under secretion of insulin resulting in hyperglycemia.

(iii) In the absence of insulin, the following functions are impaired.
- utilization and uptake of glucose by adipocytes and hepatocytes.
- Conversion of glucose into glycogen by the above target cells.

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5 Marks Questions

1. Name the hormone that regulates each of the following and mention the source of it.

1) urinary elimination of water.

2) storage of glucose as glycogen.

3) Na^+ and K^+ metabolism.

4) Basal metabolic rate

5) Descent of testes iota scrotum

Ans.

	Activity	**Hormone**	**Source**
1.	Urinary elimination of water.	ADH	Posterior pituitary
2.	Storage of glucose as glycogen	Insulin Glucagon	Islets of langerhans
3.	Na^+ & K^+ metabolism	Aldosterone	Adrenal cortex
4.	Basal Metabolic Rate	Thyroxin, Triidothyroxin	Thyroid gland
5.	Descends of testis into scrotum	FSH	Anterior pituitary

2. Explain the Hormones of adrenal gland and their action on target tissue in a tabular from.

Ans.

	Endocrine glands & Hormones	**Principal Action**	**Target tissue**
1.	Mineral corticoids (Aldosterone)	They control electrolyte and water metabolism. The increase blood level of Na^+ and water. They decrease blood levels of K^+ by stimulating kidney tubules to reabsorb more Na^+ Cl^- and water and less K^+.	Kidney tubules
2.	Glucocorticoids (corticosol corticosterone & cortisone)	They raise blood glucose level. They promote gluconeogenesis and also promote liver glycogen formation and breakdown of plasma proteins. They increase availability of amino acids for enzymes synthesis by liver general resistance to long term. Stress counter inflammatory and allergic responses, and decreases antibody production.	Liver
3.	Gonadocorticoids (Androgens and estrogens)	Concentrations secreted by adults are low. Their effects are usually insignificant. They stimulate development of secondary sexual characteristics specially in males.	Gonads
4.	Adrenaline	Stimulates elevation of blood glucose by converting liver glycogen to glucose, hormone. Rise in blood pressure acceleration of rate and force of heart beat, constriction of skin and visceral smooth muscle capillaries muscles, dilation of arterioles of heart and	Skeletal muscles fat cells, cardiac muscles, smooth muscles, blood

		skeleton increase in breakdown of lipids Increase in oxygen consumption erection of hairs, dilation of pupils. They initiate stress responses.	vessel.
5.	Nor adrenaline Hormone	It stimulates reactions similar to those produced by adrenaline.	-

3. Explain the mechanism of hormone action.

Ans. Upon the target cells, two main kinds of hormone action have been observed

i) action at meanbrane level

ii) Induction of protein synthesis at gene level.

1)Hormone acts as first messenger : It is attached to some integral protein at specific receptor site on the surface of cell membrane (of target cell). It stimulates adenyl cylase (enzyme). It catalyses conversion of ATP to cyclic AMP which acts as second messengers). It affects cell metabolism.

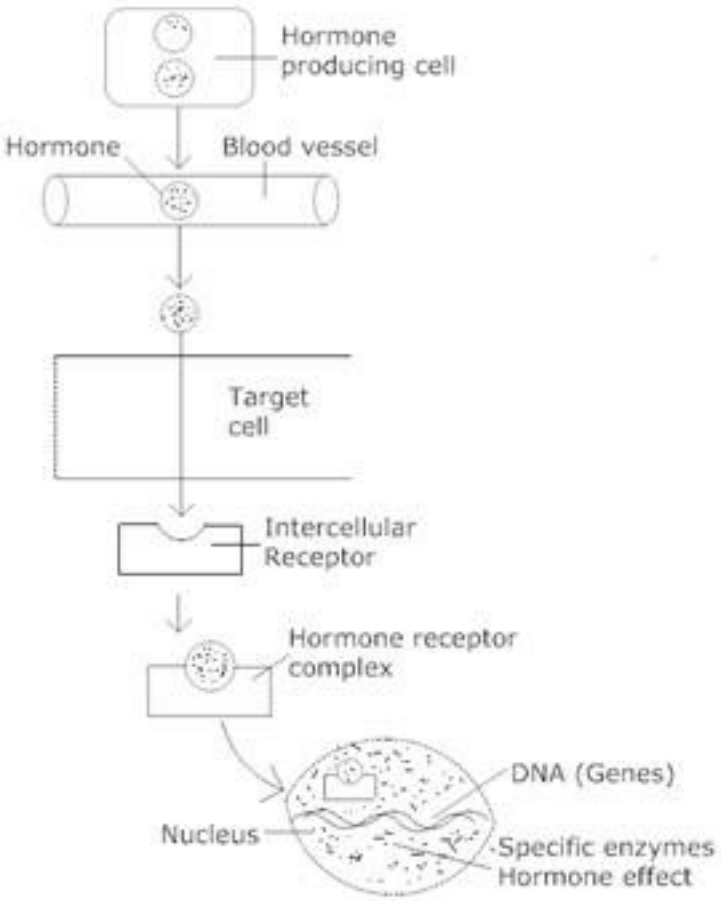

Fig : Mechanism of hormone action

2) Gene activation – The steroid hormone enters into the cytoplasm through cell membrane and binds to protein receptors there of the target cells. This hormone receptors complex stimulates the gene to synthesize a particular enzyme.

Fig : Mechanism of hormone action