

Q1 what is chemical coordination. write the types of glands.

Answer: chemical coordination :

Definition :- The coordination under the control of hormones is called chemical coordination. —OR—

“The coordination which is brought about due to chemical activity (Hormones) is called chemical coordination.”

Explanation :- In this kind of coordination a group of cells called endocrine gland release specific chemicals called — Hormones directly into blood which regulate the activities of other target cell or organ of the body.

Importance of chemical coordination:

- 1: Chemical coordination is less rapid but long lasting, such as body growth, development of sex-organs, development of secondary sexual characters, puberty and pregnancy, etc.
- 2: They control different metabolic functions of the body.
- 3: They also help in transport of substance through cell-membrane and secretion.

Gland :

Definition :- A cell or group of cells or an organ which secretes certain chemicals (such as Hormones or enzymes) into blood stream or into cavity inside body or onto its outer surface is called gland.

Endocrinology :- The study of endocrine system is called ^{Endo-}Endocrinology.

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<u>Types of glands :-</u> Glands have the following types.		
<u>1: Exocrine gland :</u> (ETEA-2018)		
<u>Meaning :-</u> Exo mean outside and crine mean to secrete.		
<u>Definition :-</u> Those glands which secrete their secretions < Enzymes > onto target sites directly through ducts are known as exocrine glands.		
<u>Ducted gland :-</u> Exocrine glands have ducts, so it is also called ducted gland.		
<u>Secretion :-</u> Exocrine secrete their chemicals (secretions) directly to target sites. for example unicellular goblet cells secrete mucin directly to target sites by exocytosis.		
<u>Example :-</u> Salivary gland, sweat gland, Liver, goblet cells.		
<u>2: Endocrine glands</u>		
<u>Meaning :-</u> Endo mean within and crine mean to secrete.		
<u>Definition :-</u> Those glands which secrete their secretions - <Hormones> directly into blood stream which will reach the secretion into the target site are known as endocrine gland.		
<u>Ductless gland :-</u> Endocrine glands have no ducts, therefore they are also called ductless glands.		
<u>Secretion :-</u> Endocrine glands secrete their secretion to extracellular space by exocytosis from where they are absorbed into blood or lymph and reach target sites.		
<u>Numbers :-</u> There are about 20 endocrine glands in human body		
<u>Example :-</u> pituitary gland, thyroid gland, parathyroid gland.		

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<u>3: Heterocrine gland:</u> <u>Meaning:-</u> Hetero mean other and crine mean to secrete. <u>Definition:-</u> Those glands which have both exocrine and - endocrine functions are called heterocrine glands. <u>Secretion:-</u> Heterocrine glands secrete different types of secretions such as hormones and enzymes. Hormones are - secreted directly to blood stream while enzymes and ions are carried through ducts towards target sites. <u>Example:-</u> pancreas act as exocrine as well as endocrine gland.		
Q2 what is hormone. Explain the chemical nature of hormones.		
<u>Answer: Hormones : <The chemical messenger>-</u> <u>Meaning:-</u> Hormone is a Greek word - "Hormon" which - mean exciting or setting in motion. <u>Definition:-</u> Hormones are the organic-substances produced by endocrine glands which regulate or inhibit the particular function. <u>Secretion of Hormones :-</u> Endocrine glands produce hormones and secrete by exocytosis directly into the extracellular - spaces. From there the hormones enter the blood or lymph and travel to specific site for action. <u>Work of Hormones : <Function>-</u> 1: The hormones effect the target cells. They do not initiate new biochemical reactions. However they regulate enzymatic and other chemical reactions already present.		

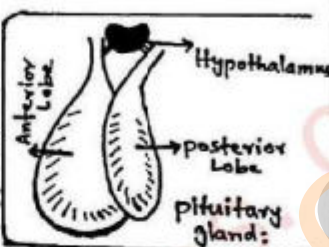
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2: Hormones may either stimulate or inhibit a function. 3: Hormones may also control some long term changes such as - rate of growth, rate of metabolism and sexual maturity. <u>Chemical nature of Hormones : <Types></u> Hormones are also grouped according to chemical structure i.e. <u>1: Steroid Hormones: (ETE-2011, 2012, 2016)</u> <u>Definition :-</u> steroid hormones are those hormones which are fat soluble molecules and made up of cholesterol. <u>Water insoluble :-</u> steroid hormones are fat soluble and water repellent (insoluble). That is, They are like lipid or fatty structures. <u>Example :-</u> 1: cortisol and aldosterone are steroid hormones secreted by adrenal cortex gland. 2: Estrogen and progesterone are steroid hormones secreted by ovaries as well as placenta. 3: Testosterone is steroid hormone secreted by male gonads (Testes) <u>2: Amino acid derivatives :</u> <u>Definition :-</u> Amino-acid derivatives are those hormones which are water soluble and derived from amino-acids (Tyrosine). <u>Water soluble :-</u> Amino acid derivatives hormones are water soluble, that is why they freely travel in blood stream and repelled by lipid or fatty-structures of cell and nucleus membrane. <u>Example :-</u> 1- Thyroxine and Triiodo-thyroxine are amino-acid derivatives secreted by thyroid gland.		

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2- Epinephrine and norepinephrine are amino-acid derivatives Secreted by Adrenal medulla gland. 3: <u>protein or peptides:</u> <u>Introduction :-</u> protein or peptides hormones consists of chains of amino-acids. many important endocrine hormones are proteins, peptides or immediate derivatives of the protein or peptides. <u>water soluble :-</u> most of protein or peptides -hormones are Soluble in water and repelled by fats or fatty structure of the cell. <u>Example :-</u> 1- <u>protein Hormones :-</u> Growth hormones and prolactin are p.H. 2- <u>Small peptides :-</u> ADH and oxytocin is made up of 9-amino-acids and are called small peptides hormones. 3- <u>Large polypeptides :-</u> Insulin, Glucagon, and parathrome are Large polypeptides hormones.		
Q3 Describe the role of diff; hormones produced by pituitary-gland. <u>Answer: pituitary gland:</u> <u>other name :-</u> pituitary gland is also called hypophysis/master gland. <u>Location :-</u> pituitary gland is located in the brain under the hypothalamus. It is attached to hypothalamus by a stalk called infundibulum. ←(ETEA-2019) <u>Controlling centre :-</u> pituitary gland functions are controlled by hypothalamus.		

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Morphology :-

- 1: Colour:- It is red-grey in colour.
- 2: Size :- It is about the size of a large pea
- 3: Shape:- It is ovoid in shape.
- 4: Weight:- It is about 0.5gm.



Structure : (Lobes)- pituitary gland consists of 3-lobes i.e.

- 1: Anterior Lobe : (Adenohypophysis)-

Master gland :- pituitary gland is also known as master - gland because it secrete such hormones which regulate the function of other endocrine glands.

Explanation :- The anterior lobe of pituitary gland is - considered the master gland of the endocrine system because it secretes a large number of hormones. some of these - hormones control body function directly and some control other endocrine glands, that is why anterior lobe is called master gland of the body.

For example :- Thyroid stimulating hormone, Follicle stimulating hormone, Adrenocorticotrophic hormone and Luteinizing - hormone which control the development and secretion of respectively gland.

Secretion of anterior lobe :- It secrete 2-types of hormones

- 1- Non Tropic Hormones :-

Definition :- Those secretions or hormones of anterior lobe which are directly involved in the controlling of different body

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parts function are called non-tropic or primary hormones. For example :- Growth Hormone, prolactin. i.e. -		
1: <u>Growth hormones: <Somatotropin></u>		
<u>Secretion</u> :- Somatotropin releasing factor is releasing from hypothalamus in response to certain stimuli, which stimulates the synthesis and releasing of growth hormones from the anterior lobe of pituitary gland.		
<u>Function or role of G.H:</u>		
1: Growth hormone has a direct effect on growth and - development of all the body parts.		
2: It stimulates and control the growth of the body and skeleton during childhood and adolescence.		
3: It activates cell division and cell growth.		
4: It also stimulates uptake of amino-acids and increase the rate of protein synthesis throughout the body.		
<u>Abnormalities of growth hormones:</u>		
1: - under secretion :- <Hyposecretion> - less secretion of growth hormone in childhood cause dwarfism.		
<u>Dwarfism: <stunted growth></u> -		
<u>Definition</u> :- The condition in which person has short height <stunted growth> due to deficiency of G.H is called dwarfism.		
<u>Characteristics</u> :- Dwarfism is characterized by -		
1: Development is much slower.		
2: Individual has short status (height).		

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3: The body parts stay in proportion. 4: Brain development and I.Q are unaffected. 2: <u>over secretion: <Hypersection></u>- over secretion of G.H. in childhood and adult-condition cause the following problems. i- <u>Gigantism</u>:- over secretion of growth hormone before maturity cause every part of the body to enlarge enormously and the individual become very tall called gigantic and this condition is called gigantism. ii: <u>Acromegaly</u>:- over secretion of G.H after maturity causes acromegaly, in which some body parts enlarges such as - nose, Lips, jaws, hands, feet, etc. In acromegaly condition the body height remains the same. Thus disproportionate growth occurs in different parts of the body and this condition is called acromegaly (mongolism) ii: <u>prolactin</u>:- <u>Secretion</u>:- It is Lactogenic hormone secreted by anterior-lobe of pituitary gland having the following important roles. <u>Function of prolactin</u>:- 1: It stimulate the development of mammary glands along with estrogen during pregnancy. 2: It also stimulate the production of milk. 3: It also inhibits the menstrual cycle in lactating mothers. 4: It also induces the behaviour which lead to the taking care of baby <i.e.-maternal or parental care of young one>.		

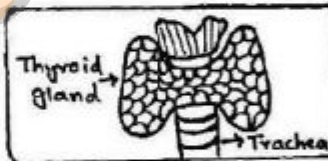
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<u>2-Tropic Hormones :-</u> <Tropi mean Turn on> <u>Definition :-</u> Those hormones or secretions of anterior lobe which regulate the secretory function of other endocrine - glands are called Tropic hormones. <u>For example :-</u> i: <u>Thyroid stimulating Hormone: <TSH></u> <u>Secretion :-</u> Thyrotropin releasing factor is releasing - from hypothalamus in response of certain stimuli, which stimulates the synthesis and releasing of TSH from the anterior lobe of pituitary gland. low level of thyroxin also stimulates the secretion of thyroid stimulating hormone by negative feedback mechanism. <u>Function of TSH:</u> 1: TSH controls the development and functioning of thyroid gland. 2: TSH also stimulates the thyroid gland to secrete thyroxin-H. ii: <u>Adrenocorticotrophic Hormone: <ACTH></u> <u>Secretion :-</u> ACTH secretion is stimulated by adreno cortico-trophin releasing factor which is releasing from hypothalamus in response of certain stimuli. <u>Function of ACTH:-</u> 1: ACTH stimulate the adrenal-cortex to secrete glucocorticoids and androgens <male sex hormone>. 2: ACTH also stimulates the growth of adrenal cortex gland. iii: <u>Follicle stimulating Hormone: <FSH></u>		

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<u>Secretion:-</u> FSH secretion is stimulated by gonadotrophin releasing factor which is released from hypothalamus in response of certain stimuli.		
<u>Function in female:-</u> 1:- It stimulates the maturation of follicle cells in the ovary of female to form specialized follicle cells called graafian follicles. 2: FSH also stimulates graafian follicles to secrete estrogen - Hormone (Female sex-Hormone).		
<u>Function in male:-</u> In males, FSH stimulates the development of the germinal epithelium of the testis and sperm production.		
<u>IV: Luteinizing Hormones:- (LH)-</u>		
<u>Secretion:-</u> LH secretion is stimulated by gonadotrophin releasing factor which is released from hypothalamus in response of certain stimuli.		
<u>Function in female:-</u> 1: LH is responsible for development of egg in the ovaries. 2: LH ruptures graafian follicle to release egg called ovulation. 3: It is also responsible for the formation of corpus luteum from graafian follicle, which then secretes progesterone H. 4: It also controls the menstrual cycle. 5: It may also lead to multiple birth in the female.		
<u>Function in male:-</u> In male LH is also known as interstitial cell stimulating hormone which stimulates interstitial cells - (Leydig's cells) in the testis of male to secrete male -		

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Sex hormone called Testosterone. ← (ETEA-2019)		
<u>2: Intermediate lobe: <Median lobe>-</u>		
<u>Location:-</u> In human, intermediate lobe of pituitary gland is a thin layer of cells present b/w anterior and posterior lobes.		
<u>Reduced gland:-</u> median lobe is not well development in human.		
<u>Melanocyte Stimulating hormone: <MSH>-</u>		
<u>Secretion:-</u> The intermediate lobe of pituitary gland produces melanocyte stimulating hormone. MSH is more secreted - during pregnancy <because developing baby need it> but - external light also governs its secretion. Its secretion is inhibited by hypothalamus.		
<u>Function of MSH:-</u> MSH stimulates melanocytes in skin to produce brown-pigment called melanin which darken the skin and hair.		
<u>Abnormalities:-<Addison's disease>-</u>		
Excess MSH is secreted in addison's disease. one of the symptoms of which is darkening of the skin or produce black spots in the skin, specially during pregnancy <melasma>.		
<u>3: posterior lobe: <Neurophysis></u>		
<u>Storage secretion:-</u> posterior lobe of pituitary gland stores ADH and oxytocin hormones but it cannot synthesize any - hormone itself. posterior lobe releases these hormones in response to nerve impulse from hypothalamus.		
<u>Example: 1: Antidiuretic hormone: <ADH or vasopressin>-</u>		
<u>meaning:-</u> "anti"—against, "diuresis"—urine production.		

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<u>Definition</u> :- The hormone or chemical which inhibits urine production is called ADH or Vasopressin.		
<u>Secretion of ADH</u> :- The secretion of ADH is caused by - decrease in blood pressure, blood-volume and osmotic pressure <decrease in water level> of the blood, detected by osmo-receptors in hypothalamus. ← (ETEA-2005)		
<u>Function of ADH</u> : (ETEA-2014, 2016)		
1: ADH increases the permeability of distal convoluted tubules and collecting ducts of nephrons to reabsorb water from filtrate.		
2: When more water is absorbed, concentrated urine is produced.		
3: It also causes blood volume increases and solute concentration decreases.		
4: It also causes contraction of arteries, thus it increases B.P.		
<u>Abnormalities</u> : <Diabetes insipidus>		
Lack of ADH causes diabetes insipidus. as a result there is the production of large quantities of dilute urine and great thirst and low blood pressure.		
ii: <u>Oxytocin</u> : (ETEA-2012, 2018)		
<u>Meaning</u> :- Oxytocia mean child-birth.		
<u>Secretion</u> :- Its release is stimulated contraction of cervix and uterus, decrease in progesterone level in blood and neural stimuli of mother during child-birth. In lactating or nursing mothers, sucking <called letdown reflex> also - causes the releasing of oxytocin.		
<u>Function of oxytocin</u> :-		

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1: Oxytocin causes strong contraction of uterine muscles during birth. 2: Oxytocin also causes contraction of uterine muscles or wall after birth to expel placental remains. 3: It also causes ejection of milk from mammary glands when mammary glands are sucked by baby called milk ejection reflex.		
Q4 Describe the role of hormone secreted by thyroid gland.		
Answer: <u>Thyroid gland:</u>		
<u>Meaning:-</u> Thyroid is greek work Thureos means shield like.		
<u>largest gland:-</u> Thyroid is largest endocrine gland.		
<u>Location:-</u> Thyroid gland is present in the lower region of neck, below the larynx, in front of trachea.		
<u>Shape:</u> It is shield or butterfly shaped.		
<u>weight:-</u> It is about 20 to 25 gms.		
<u>Colour:-</u> It is reddish brown in colour.		
<u>Lobes:-</u> Thyroid gland consist of two lobes. These lobes are connected with one another by isthmus.		
<u>Secretion of Thyroid gland:-</u> Thyroid gland secretes 3-hormones i.e- T_3, T_4 and calcitonin.		
1: Tri and Tetra-iodothyroine: $\langle T_3, T_4 \rangle$		
<u>Iodine containing Hormones:-</u> T_3 and T_4 are iodine containing hormones. T_3 -contains three iodine atoms in their structure while T_4 (thyroine) contains 4-iodine atoms in their structure Hence the names T_3 and T_4.		



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<u>Secretion of T_3 and T_4 :-</u> The following factors helps in it secretion.		
i: <u>TSH :-</u> TSH from anterior lobe of pituitary gland stimulates production and releasing of both hormones of thyroid gland.		
ii: <u>Iodine :-</u> Thyroid gland needs iodine for synthesis of - thyroxin hormone.		
iii: <u>Negative feedback mechanism :-</u> The level of thyroxin - circulating in the blood regulates the secretion of these - hormones from the thyroid gland by negative feedback - mechanism involving the hypothalamus and anterior lobe of pituitary gland.		
iv: <u>Body condition :-</u> The thyroid gland is active continuously but produces higher levels of secretions during peroid of - rapid growth, sexual maturation and stress situation <cold,hunger>		
<u>Function of T_3 and T_4 :-</u> <Thyroxin> (ETEA-2011)		
1: They promote basal metabolic rate of the body by enhancing glucose catabolism and release of heat and generation of ATP.		
2: They also stimulates the synthesis of cholesterol in the liver.		
3: They promote the development of nervous system in fetus and infants.		
4: They act on muscles for their development and functioning.		
5: They promote growth and maturation of skeleton.		
6: They also promote normal motility of the gastrointestinal tract.		
7: They also regulate the process of growth especially - maturation, sexual and mental development.		
<u>Abnormalities :-</u>		

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<u>1: Hyperthyroidism: (ETEA-2005)</u>		
<u>Definition:-</u> The over secretion of thyroxin (T_3, T_4) by - thyroid gland is known as hyperthyroidism.		
<u>Hyperthyroidism problems:-</u> The over secretion of thyroid Hormones (T_3, T_4) causes the following problems or disorders.		
<u>i: Graves diseases :</u>		
<u>Introduction:-</u> Graves is an autoimmune disease in which sometimes immune system generates abnormal antibodies. These abnormal antibodies will take the receptor of TSH and will abnormally stimulate thyroid cell to secrete more and more thyroxin. Due to such over stimulation of thyroid gland the graves disease is developed.		
<u>Symptoms :-(characteristics)</u>		
1: Higher metabolic rate.	2: increased heart rate.	
3: High Blood pressure.	4: weight loss due to less intake of food.	
5: Trouble in sleeping.	6: profuse sweating.	
7: Nervousness (worried).	8: increased body temperature.	
9: Disturb behaviour.	10: increased ventilation rate.	
<u>ii: Exophthalmia: (ETEA-2016)</u>		
<u>Definition:-</u> The protrusion of eye balls due to Graves - disease resulting from hyperthyroidism is called exophthalmia.		
<u>Explanation:-</u> Thyroid related exophthalmia is resulted from swelling of the tissues around the eye and within the orbit that develop in reaction to the high levels of thyroxin.		

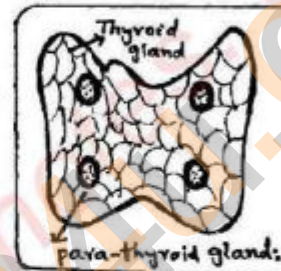
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<u>Symptoms :- <characteristics></u>		
1: Enlargement of entire gland.	2: Bulging of eye balls.	
3: Fast heart beat.	4: High Blood pressure.	
5: Rapid respiration.	6: loss in weight.	
<u>2: Hypothyroidism:</u>		
<u>Definition :-</u> The under secretion of thyroid hormones (T_3, T_4) by thyroid gland is called Hypothyroidism.		
<u>causes of under secretion :-</u> The under-activity (low secretion) of the thyroid gland may be due to lack of TSH production by anterior lobe of pituitary gland, iodine deficiency in food or failure of enzyme-system involved in thyroxin production.		
<u>Hypothyroidism problems :- <Disorders></u>		
Due to hypothyroidism the following problems/disorders develop		
<u>1: Goiter :-</u> (ETEA-2006, 2019)		
<u>Definition :-</u> The enlargement of thyroid gland due to the deficiency of iodine is called goiter.		
<u>Explanation :-</u>		
<u>1-iodine deficiency :-</u> Thyroid gland needs iodine for the production of their hormones. if iodine is deficient in soil and water so thyroid gland will be unable to secrete thyroxin as a result level of thyroxin decreases in blood.		
<u>2-Stimulation of TSH :-</u> low level of thyroxin in blood is detected by hypothalamus which stimulates the secretion of TSH from anterior pituitary gland. such TSH stimulates thyroid gland		

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to secrete thyroxin but as there is deficiency of iodine, so thyroxin can't be formed and secreted. in such condition the hypothalamus further stimulates the anterior pituitary gland to secrete TSH in large amount.		
<u>3- Enlargment of thyroid gland :-</u> if the level of TSH increases, so more stimulation of thyroid gland occurs. more stimulation of thyroid gland causes it to enlarge and this enlargement of thyroid gland is called goiter.		
<u>Iodine treatment :-</u> Table salt with iodine is recommended so that there is no deficiency of iodine and hence thyroxin is synthesized in the body.		
<u>ii: Cretinism:</u>		
<u>Definition :-</u> The less secretion of thyroxin at birth or in - infant result in severe hypothyroidism condition called cretinism.		
<u>Symptoms : <characteristics></u>		
1: child is mentally retarded. 2: poor physical growth. 3: disproportionate body size. 4: Infertility is common. 5: Bone maturation and puberty are severely delayed.		
<u>iii: Myxedema:</u>		
<u>Meaning :-</u> myxedema means - mucous swelling.		
<u>Definition :-</u> The full-blown hypothyroid-syndrome due to - deficiency of thyroid hormone at adult stage is called myxedema.		
<u>causes of myxedema :-</u> iodine deficiency.		
<u>Symptoms : <characteristics></u>		

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1: Body weight increases due to formation and storage of a semifluid material under the skin. 2: low metabolic rate. 3: Feeling chilled, puffy eye. 4: Edema, tongue swelling. 5: Lethargy, constipation. 6: Thick and dry skin with hair lost from the scalp and eyebrow. 7: mental sluggishness < slow processing >. iv: <u>Endemic or colloidal goiter:</u> <u>Introduction:-</u> Myxedema may result from lack of iodine. as a result the thyroid gland enlarge and protruded. so such condition in which goiter is developed due to myxedema is called endemic or colloidal goiter. i.e.- 1: <u>Endemic goiter:-</u> Goiter in a particular area due to deficiency of iodine in soil and drinking water is called E-goiter. 2: <u>colloidal goiter:-</u> The enlargement of follicular cells of thyroid gland with large number of spaces among them is called colloidal goiter. They may be grow large but not spread beyond the thyroid gland. 2: <u>Calcitonin Hormone:</u> <u>calcium regulation hormone:-</u> calcitonin hormone is released by thyroid gland to control Ca^{+2} level in blood plasma or in extracellular fluid. It play minor but direct role in Ca^{+2} regulation. <u>Secretion:-</u> High Ca^{+2} ions concentration in the blood cause stimulation of the synthesis and release of calcitonin. low Ca^{+2} ion level suppresses it manufacture.		

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<u>Function of calcitonin</u>:- calcitonin decreases Ca^{+2} level of blood to normal level by bringing the following changes in the body. 1: when the level of Ca^{+2} ion rise, calcitonin promotes Ca^{+2} deposition into bones. 2: calcitonin also inhibits Ca^{+2} absorption by the intestines. 3: It also decreases Ca^{+2} reabsorption by the kidney - tubules and allowing its excretion in urine. 4: It also inhibits K^{+} ions reabsorption in kidney-tubules. 5: calcitonin is most important in childhood, because in such condition the skeleton grow quickly and bones are - changing dramatically in mass, size and shape which need Ca^{+2}. <u>Abnormalities:</u> (ETEA-2017) 1: <u>Hyper-secretion</u>:- < Hypocalcemia > when more - calcitonin is secreted, more Ca^{+2} will be deposited into - bones or excreted in urine. As a result, decrease Ca^{+2} level occurs in blood called hypocalcemia which causes excitability of neurons, tetany, etc. 2: <u>Hypo-secretion</u>:- < Hypercalcemia > The over secretion of calcitonin causes hypercalcemia (more Ca^{+} in blood) which causes - Disturbance in muscle function, depression and kidney stones. <u>Q5</u> Describe the role of parathyroid gland-hormones. <u>Answer:</u> parathyroid gland:-		

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<u>Location</u>:- parathyroid glands are located on the thyroid gland, that stick out from the ventral surface of the thyroid gland. <u>Colour</u>:- They are small, light coloured lumps or mass. <u>Size</u>:- Their size is like pea seeds. <u>Number</u>:- parathyroid glands are 4 in No. <u>Weight</u>:- It is about 0.05 grams in weight. <u>Secretion</u>:- parathyroid glands secrete parathormone hormone (single type H). <u>Parathormone Hormone</u>:- (ETEA-2016) <u>Secretion</u>:- low level of Ca^{+2} ions stimulate the parathyroid gland directly to increase parathormone production. High levels of Ca^{+2} ions suppresses its secretion. <u>Function of parathormone</u>:- whenever there is decrease in Ca^{+2} level in blood, parathormone increase it to normal by carrying the following changes in body. 1: It increases the level of Ca^{+2} and minerals in the blood by removing it from bones due to stimulation of osteoclasts - bone cells (bone dissolving cells) - 2: It stimulates the reabsorption of Ca^{+2} in kidney tubules. 3: It also helps to activate vitamin-D. then vitamin-D - stimulates the absorption of Ca^{+2} from nutrients in small intestine. <u>Abnormalities</u>: 1: <u>Hyperparathyroidism</u>: <u>Definition</u>:- The over secretion of parathormone hormone		



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by parathyroid gland is called hyperparathyroidism. <u>causes:-</u> over secretion of parathormone is usually a - result of a parathyroid gland tumor. <u>Hyperparathyroidism problems:-</u> Due to over secretion of parathormone hormone, the following problems may develop. i: <u>Bone become soft and brittle :-</u> Due to more parathormone hormone in blood, the Ca^{+2} and minerals is removed from bones so bones become soft and brittle and easily fractures occurs. ii: <u>Hypercalcaemia:</u> <u>Definition:-</u> It is the condition in which Ca^{+2} level elevates (High). <u>causes:-</u> Hypercalcaemia is due to high level of parathormone hormone which arise the Ca^{+2} level in blood. <u>Effects :-</u> 1- Hypercalcaemia depresses nervous system. 2- Hypercalcaemia causes weakness of muscles. 3- Excess Ca^{+2} - salts precipitate in the kidney leading to stone formation. 2: <u>Hypoparathyroidism:</u> <u>Definition:-</u> The under secretion of parathormone hormone by parathyroid gland is called hypoparathyroidism. <u>Hypoparathyroidism problems:-</u> Due to under secretion of parathormone the following problems or disorders may develop. i: <u>Hypocalcaemia:</u> <u>Definition:-</u> It is the condition in which blood Ca^{+2} level decreases <u>causes :-</u> Hypocalcaemia is due to low level of parathormone hormone, as a result most Ca^{+2} excrete with urine.		

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Effects of Hypocalcemia:

- 1: low level of Ca^{+2} in the blood causes excitability of muscles and Nerve
- 2: low Ca^{+2} level also leads to tetany in which muscles remain in contracted state.

Q6 Describe the role of hormones produce by Islets of -

Langerhan's or pancreas.

Answer: pancreas:

Location:- pancreas is located in the abdominal cavity near the stomach.

Heterocrine gland:- pancreas is a — heterocrine gland (Exocrine+endocrine)

length:- pancreas length is about 12 to 15 cm in adult.

colour:- It is pinkish in colour.

weight:- Its weight is about 80 grams.

Dual nature :- (Double gland) pancreas is a double gland as it serves both as exocrine and endocrine gland. i.e-

1: Exocrine part:- The bulk of the pancreas is exocrine and is formed of acinar-cells which synthesize pancreatic juice (rich in digestive enzymes). The pancreatic juice is then delivered to the duodenum by pancreatic duct during food digestion.

2: Endocrine part: The Islets of pancreas act as endocrine - glands which secretes the insulin and Glucagon-hormones directly into blood that control the sugar level.

Islet's of Langerhan's or pancreas:-



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<u>Definition</u>:- The clusters of cell embedded in the pancreas tissue, appear like islet called Islets of Langerhan's or pancreas <u>Number</u>:- Islets of Langerhan's are one-million in No, which make 2% body mass of pancreas. <u>Types of Islets</u>:- Endocrine islets consists of following types 1- <u>Alpha cell</u>:- It is the type of islets of langerhan's which secrete glucagon-hormone that convert glycogen into glucose. 2- <u>Beta-cell</u>:- It is the type of islets of langerhan which secrete insulin-hormone that convert extra-glucose into storage form called glycogen. 3- <u>Delta cell</u>:- It is the type of Islets which secrete somato-statin Hormone that regulate insulin and glucagon hormones level in blood according to need. <u>Endocrine secretion of pancreas</u>:- Endocrine secretions of pancreas are insulin, Glucagon, etc. i.e- 1: <u>Insulin</u>: (ETEA-2012) <u>Definition</u>:- It is a proteinaceous hormone secreted by B-cell of pancreas which control the sugar level in blood. <u>Secretion</u>:- Insulin is released by beta-cells of pancreas - Islets in response to a rise in blood glucose level. <u>Function of insulin</u>:- Insulin reduces blood glucose level to normal level by carrying out following changes or function in the body. i: <u>Decrease glucose level</u>:- (ETEA-2019)		

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1: Insulin increases the rate of glucose uptake by most body cells especially skeleton muscles and fat-cells, to reduce glucose level. 2: It promotes glycogenesis (synthesis of glycogen) in Liver and muscle cells. 3: It also increases the use of glucose in cellular respiration. <u>ii: Stimulation:</u> 1: Insulin promotes the conversion of excess glucose to fats. 2: It also increases the rate of uptake of amino-acids into the cells and the rate of protein-synthesis. <u>iii: Inhibition :-</u> It also inhibits gluconeogenesis (glucose synthesis from non-carbohydrate substances) and glycogenolysis (— conversion of glycogen into glucose). <u>Abnormalities:</u> <u>1: less secretion :-</u> Failure of pancreas to secrete insulin, decreases the use of glucose and also its conversion into glycogen. Thus level of glucose rises than normal. <u>less secretion problems :-</u> Due to less secretion of insulin the following problems or disorders may develop. <u>Diabetes mellitus:</u> <u>Definition :-</u> It is a disorder in which sugar cannot be metabolized and kidneys cannot reabsorb the glucose from the filtrate and excess of glucose begins to be lost from the body in the urine. <u>Explanation :-</u> Due to deficiency of insulin in body, the sugar		

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cannot properly metabolized. as a result the sugar increases in blood (called hyperglycemia) and begins to excrete in urine (called glycosuria). Hyperglycemia and glycosuria - combine contribute to disease called diabetes-mellitus. <u>Symptoms: <characteristics> (ETEA-2015, 2019)</u> 1- <u>Hyperglycemia</u> :- a condition of high level of glucose in blood. 2- <u>polyuria</u> :- a condition of abnormally large volume of urine is produced is known as polyuria. 3- <u>polydipsia</u> :- A condition of excessive thirst, called polydipsia. 4- <u>polyphagia</u> :- A condition of extreme hunger because most of glucose is lost in urine is called polyphagia. 5- Delay wound healing. 6: cardiovascular diseases. 7- High level of acidic products in blood. 8- more urination so lead to dehydration of the body. 9- A disturbance of the body's osmotic equilibrium. <u>2: over secretion:-</u> Hypersecretion of insulin causes decrease in blood glucose - level and lead to a disorder called hypoglycemia. i.e <u>Hypoglycemia:</u> <u>Definition:-</u> The decrease the blood glucose level due to hyper-secretion of insulin is called hypoglycemia. <u>Explanation:-</u> IF excess insulin is produced the utilization of sugar will be too great and sugar level falls in the blood. <u>Symptoms: <characteristics></u>		

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1: Brain cells will be effected because brain cells only use - glucose. It lead to over excitability of brain and patient goes to coma. 2: low blood glucose level causes breakdown of muscle-tissue. 3: loss of weight , Tiredness. 4: hunger, sweating. 5: Severe depression in nervous system. 6: if remains untreated, can cause disruption of heart - activity and transport of oxygen. 7: Irritability , double vision. 8: unconsciousness and even death. <u>2: Glucagon:</u> <u>Definition :-</u> Glucagon is a proteinaceous hormone which is secreted by alpha-cells of pancreas and responsible for conversion of Glycogen into glucose to regulate the glucose level in blood. <u>Secretion :-</u> Glucagon is released by alpha-cells of pancreas when blood glucose level is low. sympathetic nervous system also stimulates its secretion. But high blood glucose level, insulin and Somatostatin-hormones suppress glucagon secretion. <u>Function of Glucagon :-</u> when blood glucose level decreases , then Glucagon increases its level to normal by performing the following processes in the body. 1: Glucagon promotes glycogenolysis (breakdown of glycogen). 2: It promotes gluconeogenesis. (synthesis of glucose from Lactic acid and other non-carbohydrate compound like-protein and fats.		

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3: Glucagon also promotes the release of glucose to blood by Liver cells which causes blood glucose levels to rise.

Abnormalities :

Glucagon abnormalities are rare as endocrine disorders. But tumors on the beta-cells will causes excess glucagon - secretions. as a result the high blood glucose levels. This in turn damage the alpha-cells of pancreas.

Q7 Describe the role of hormone produced by Adrenal gland.

Answer: Adrenal gland:

Location : Adrenal glands are located on the upper ends of kidneys like caps.

Number :- Adrenal glands are two in number, present one on each kidney.

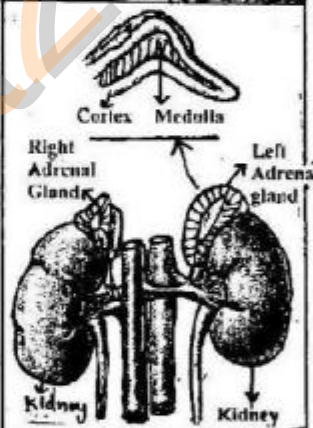
Weight :- Each adrenal gland is about 5 grams in weight.

Structure :<parts> Each adrenal gland is composed of 2-parts - outer cortex and inner medulla. i.e -

1: Adrenal cortex: (ETE-2005)

outer part :- cortex is outer reddish brown part of adrenal gland.

Secretion :- The secretion of adrenal cortex is under the control of ACTH secreted by anterior lobe of pituitary gland. Adrenal cortex secretes different steroid hormones (about 50-different types) which are collectively known as —



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Corticosteroids. all corticosteroids are closely related in chemical structure but they have different functions. For example:- Some common corticosteroids hormones are- i: <u>Glucocorticoids</u>:- Glucocorticoids increases blood glucose level mainly by its production from protein and by — antagonizing the action of insulin. ii: <u>Aldosterone</u> : <Mineralocorticoids> Aldosterone is secreted in response to low blood pressure and low level of Na^+ and high level of K^+ in blood. ACTH also effects its secretion. <u>Function of Aldosterone</u>:- 1- Aldosterone stimulate the reabsorption of Na^+ ions from glomerulus - filtrate in kidney. as a result it can conserve the level of Na^+ ions in the blood. 2- when Na^+ is increased than water is reabsorbed. In this way amount of blood and blood pressure are maintained. iii: <u>Androgens</u>:- Very small amounts of androgens are secreted in both male and female by adrenal cortex. androgens causes development of the secondary male sexual characters. <u>Abnormalities of Adrenal cortex</u>:- over or less secretion of adrenal cortex secretions causes the following problems or disorders. 1- <u>Addison's disease</u>:- Addison's disease is due to less secretion of glucocorticoids hormone, characterized by low level of sugar in blood, weak muscle-action, inflammation of body-joints		

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and back spot on the body, Fatigue, Low BP, visual problems. <u>2- Cushing disease</u> :- Cushing disease is due to over — secretion of glucocorticoids Hormones characterized by — high level of glucose in blood, hair on face, gain of weight, big shoulders, high cholesterol level, etc. <u>2: Adrenal Medulla:</u> <u>Inner part</u> :- Medulla is the inner part of adrenal gland — which is greyish in colour. <u>Secretion</u> :- Adrenal medulla contains androgenic nerves. — Nerve like cells or modified ganglionic sympathetic neurons that synthesize epinephrine and nor epinephrine which are peptide hormones. <u>Emotional hormones</u> :- Both epinephrine and nor-epinephrine hormones are collectively known as emotional hormones — because these are secreted under situation of stress, fear, anxiety and other unusual situations. <u>1- Epinephrine</u> : <Adrenalline> (BTEA-2006, 2019) <u>Vasodilator</u> :- Epinephrine is known as general vasodilator because it vasodilates blood vessels during emotions and prepare body for flight or fight during stress and emergency. <u>Controls</u> :- Epinephrine controls sympathetic division of — peripheral nervous system. <u>Function of epinephrine:</u> 1: Epinephrine promotes the conversion of liver glycogen into glucose.		

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2: Epinephrine also increases the oxygen consumption i.e. increases the metabolic activities. 3: It also increases the heat production. 4: Epinephrine increases heart beat. 5: It also increases blood flow to skeleton-muscles, heart, and internal-organs. 6: It causes vasodilation and bronchial dilation mostly during acute asthmatic attacks.		
<u>2- Nor epinephrine: <non adrenalline></u>		
<u>Vasoconstrictor :-</u> nor-epinephrine hormone is also known as general vasoconstrictor because it vasconstricts blood vessels during emotions.		
<u>controls :-</u> nor-epinephrine controls parasympathetic - division of peripheral nervous system.		
<u>Function of norepinephrine :</u>		
1: norepinephrine decreases blood flow to various organs. 2: It also increases the conversion of liver glycogen into glucose. 3: It increases blood pressure.		
<u>combined or same effects:-</u> Both epinephrine and nor - epinephrine have same effects i.e. -		
1- Both hormones are involved in raising blood pressure. 2- Both hormones promote the release of glucose from liver glycogen. 3- Both hormones increases heart beat and glucose level in blood. 4- Both hormones allow more blood flow to lungs.		

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QB Describe the role of hormones produce by gonads.		
Answer:- Gonads:		
Definition:- Gonads are reproductive organs which are responsible for the formation of gametes (cytogenic function) but gonads also act as endocrine glands because it also secretes hormones (endocrine function)-		
Types of gonads:- Gonads are two types. i.e.-		
1: ovaries :-		
female gonad:- ovaries are female gonads. ovaries not only produce female gametes (eggs) but also secrete female sex hormones — estrogen and progesterone.		
Number:- ovaries are 2 in number, one left and one right.		
Location:- ovaries are present in abdominal-cavity.		
Secretion of ovaries:- ovaries secrete two types of hormones.		
i: Estrogen:		
secretion:- Estrogen is secreted by ripening follicles — (graafian follicles) of the ovaries.		
Function of estrogen:-		
1: Estrogen bring about the development of the secondary — sexual characters in female.		
2: It also causes thickening of the uterine-wall.		
3: It also helps in healing and repair of uterine wall after → menstruation.		
4: under the influence of estrogen, some of the cells of uterine wall become glandular and start secreting —		

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proteinaceous secretions which are taken up by the - embryo in its early stages of development. 5: Estrogen also causes release of egg called ovulation. 6: Estrogen prevents thinning of bone in female after menopause. 7: Estrogen promotes breast development and cyclic changes in the uterine mucosa in the menstrual cycle. <u>Abnormalities: <under secretion></u> Deficiency of the estrogen or sex-hormones leads the young female in failure to mature sexually and sterility in adult. <u>2: progesterone :</u> <u>secretion:-</u> progesterone hormone is secreted by those - graffian follicle from which egg is released called corpus - luteum <u>Function of progesterone:</u> 1: progesterone inhibits further FSH-secretion from pituitary gland. 2: It causes thickness of uterus. 3: It suppresses ovulation during pregnancy. 4: It causes vascularization of uterine walls. 5: It also maintains pregnancy by preventing contraction of uterine wall till birth. 6: It causes the development of breast during pregnancy. <u>2: Testes :</u> <u>male gonads :-</u> Testes are male reproductive organs or gonads. Testes produces sperms but also act as endocrine glands. <u>Number :-</u> Testes are two in number.		

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<u>Location</u> :- Testes are located in a sac like structure called Scrotum hanging outside the abdomen. <u>Secretion</u> :- Testes secrete Testosterone as male sex hormone. <u>Testosterone</u> :- Testes consists of many coiled seminiferous tubules, in which sperms formation occurs. between these tubules interstitial cells (e.g. Leydig's cells) are present which produce male sex-hormone called testosterone. <u>Function of Testosterone</u> : 1: In foetus Testosterone initiate the development of sex organs 2: At puberty, it brings about development of male - secondary sexual characters and promotes the sex drive. 3: It increases general metabolism inducing growth. 4: Testosterone is necessary for normal sperm production. 5: It also maintains the reproductive organs, sexual desire and regulates mating behaviour. <u>Abnormalities</u> :- <u><under secretion></u> low secretion or level of testosterone causes failure of sexual maturation in young ones which causes sterility in adults. Q9 What is feedback mechanism. write its types. <u>Answer: Feedback mechanism</u> : <u>Definition</u> :- The mechanism in which product of the reaction itself controls the controlling centre is known as feedback mechanism.		

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<u>Explanation :-</u> For proper body functions, two opposing systems are needed. if there accelerators, there must be inhibitors. for example, if one hormone in the body promotes or stimulates a reaction, another hormone will check it.		
<u>Types of feedback mechanism :-</u> It has two types. i.e.-		
<u>1: Negative feedback mechanism :-</u>		
<u>Definition :-</u> A homeostatic interaction in which the increasing amount of one hormone decreases the secretion of another hormone is called negative feedback mechanism.		
<u>Explanation with example :</u>		
<u>i: Secretion and suppression of insulin :-</u>		
1: A good example of negative feedback is with the hormone called insulin, that regulate blood glucose level.		
2: when we take a meal, the carbohydrates are digested and covered into glucose.		
3: Glucose is absorbed into the blood from small intestine, thus increase glucose level in the blood.		
4: when this blood passes through the pancreas, the islets of pancreas at once sense this increase and start secretion of insulin in the blood.		
5: Insulin causes a reduction in the blood glucose by promoting their uptake into Liver, muscles, adipose-tissue, etc. here the extra-glucose is converted into glycogen and is stored		
6: This causes reduction of glucose in the blood. when -		

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This blood passes again through the islets of pancreas, they feel this decrease and stop secretion of insulin by negative feedback mechanism.

ii: Secretion and suppression of Glucagon:

- 1: During fasting, when blood glucose level falls below normal level and such blood flows through pancreas, The pancreas detects decrease in blood glucose level and secrete - glucagon.
- 2: Glucagon increases blood glucose level to normal by performing different functions such as glycogenolysis and gluconeogenesis.
- 3: when this blood having normal glucose level passes through pancreas, pancreas again detects the change and stops further secretion of glucagon by negative feedback mechanism.

2: positive feedback mechanism:

Definition:- The type of feedback mechanism in which the - product of a reaction further stimulates the controlling centre to enhance the activity until the activity is finished is called positive feedback mechanism.

Explanation with example: - <child birth> (ETEA-2020)

- 1: During childbirth the baby head touches the receptors of cervical canal or uterus, as a result the posterior -



Pituitary gland secretes oxytocin hormone.

- 2: Oxytocin then stimulates the uterine-muscles to contract.
- 3: The contraction of uterine wall is acting as stimulus for oxytocin secretion. So more the uterus contracts the more will be oxytocin secretion.
- 4: As the amount of oxytocin increases the contraction of uterine walls also increases.
- 5: More contraction of uterine wall causes greater pressure against uterine opening which brings childbirth to completion.
- 6: Just after birth uterine contraction slows down and thus oxytocin secretion also slows down.
- 7: The above example shows that the effector response — (secretion of oxytocin) will be in similar direction to stimulus (uterine contraction) is called positive feedback mechanism.

— [End] —

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Exercise

Exercise MCQs

A . Multiple Choice Questions (MCQs).

1. *Exophthalmia* is condition which results due to:

a) Graves's disease	b) Goitre
c) Cretinism	d) Hypocalcaemia
2. Which of the following is manifested in the production of abnormally large amount of urine?

a) Polyphagia	b) polydipsia
c) Glycosuria	d) Polyuria
3. if too much growth hormone is released during the growth period. It result in

a) Acromegaly	b) Crohn's Disease
c) Gigantism	d) graves' disease
4. which of the hormone is responsible for milk secretion after parturition.

a) Insulin	b) Prolactin
c) Lactogenic	d) thyroxine
5. Which hormone is produced by thyroid in addition to thyroxine (T₄) and triiodothyronine (T₃)?

a) Thyroid-stimulating hormone	b) Adrenocorticotrophic hormone
c) Calcitonin	d) Gonadotropic hormones
6. Which of the following is NOT a hormone of anterior pituitary?

a) Growth hormone	b) Follicle stimulating hormone
c) Oxytocin	d) Adrenocorticotrophic hormone
7. a person is about to face an interview. But during the first five minutes before the interview he experiences sweating, increased rate of heart beat, respiration etc. Which hormone is responsible for his restlessness?

a) Estrogen and progesterone	b) Oxytocin and vasopressin
c) Adrenaline and noradrenaline	d) Insulin and glucagon
8. One of the following conditions is not linked to deficiency of thyroid hormones

a) Cretinism	b) Goitre
c) Myxedema	d) Exophthalmos
9. Which of the following condition is resulted from excess GH in adults?

a) Cushing's disease	b) acromegaly
c) hyperthyroidism	d) diabetes mellitus

- Answer: (Key)

1-a	2-d	3-c	4-b
5-c	6-c	7-c	8-b
9-b	10-d	11-a	12-a
13-d	14-a	15-b	16-a

Short Questions

Q1: - Differentiate b/w endocrine and exocrine glands.

Answer: see Question No-1 (write only endo; and exocrine glands)

Q2: - why anterior pituitary gland is called master gland?

Answer:- see Question No-3. (write only - master gland definition, Explanation and example).

Q3: - List down the effects of hyperthyroidism.

Answer:- see Question No-4 (write only - problems of hyperthyroidism in Question No-4).

Q4: - why pancreas is known as double gland.

Answer:- see Question No-6. (write only - dual nature - or double gland topic in Question-6).

Q5: - why insulin is so vital for normal survival.

Answer:- Insulin:

Introduction:- Insulin is an anabolic peptide hormone - secreted by the beta cells of the pancreas acting through a receptor located in the membrane of target cells (liver, skeletal muscle, brain cell, etc).

vital for normal survival:- (role)

1: The actions that insulin has are to allow glucose to enter cells to be used as energy and to maintain the amount of glucose found in the bloodstream within normal levels.

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2: The release of insulin is tightly regulated in healthy - people in order to balance food intake and the metabolic needs of the body.		
Q6:— what is the role played by Lutenizing hormones in male and female respectively. ?		
<u>Answer:-</u> See Question-3. (write only L.H in tropic hormone)		
Q7:— what are the effects of hypothyroidism (observed during pregnancy) on development and maturation of a growing baby.		
<u>Answer: Hypothyroidism vs pregnancy:</u>		
<u>Introduction:-</u> During the first few months of pregnancy the fetus relies on the mother for thyroid hormones. Thyroid hormones play an essential part in normal brain development. Deprivation of the maternal thyroid hormone due to hypothyroidism can have irreversible effects on the fetus.		
<u>Effects of hypothyroidism:</u>		
Hypothyroidism during pregnancy causes defective - development and maturation of the growing baby leading to stunted growth (cretinism), mental retardation, Low intelligence quotient (low I.Q), abnormal-skin, - deafmutism, etc.		
Q8:— mention difference b/w hypothyroidism and hyperthyroidism.		
<u>Answer: 1: Hypothyroidism:</u>		
<u>Definition :-</u> The under secretion of thyroid hormones (T_3, T_4) by thyroid gland is called hypothyroidism.		

Effects :- If thyroid hormones is produced less than the required amount, cellular metabolism become slows. It results in Lethargy, weight gain, low heart rate and body temperature.

2: Hyperthyroidism:

Definition :- The over secretion of thyroid hormones (T_3, T_4) by thyroid gland is called hyperthyroidism.

Effects :- If thyroid hormones is produced more than the required amount, cellular metabolism become faster than normal. It results in weight loss, high blood pressure, heart rate and body temperature.

Q9:- A sample of urine was diagnosed to contain high content of glucose and ketone-bodies. Based on this observation, answer the following -

Qa:- which endocrine gland and hormone is related to this condition

Ans:- pancreas gland and insulin Hormone.

Qb:- Name the cells on which hormone acts.

Ans:- Insulin helps control blood glucose levels by signaling the liver, muscle and fat-cells to take in glucose from the blood and store it as glycogen.

Qc:- what is the condition called and how can it be rectified

Ans:- Diabetic ketoacidosis:- The condition in ^{which} patient urine contain high content of glucose and ketone bodies (acids) is known as diabetic ketoacidosis.

causes:- Normally, our body burns glucose for energy.

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if our cells don't get enough glucose, our body burns fat for energy instead. This produces a substance or acid called Ketones, which can show up in our blood and urine. <u>Treatment :- < Rectified ></u> 1: Insulin through an IV bring your ketones down. 2: Fluid to get you hydrated. 3: Electrolyte replacement through an IV.		
Long Questions		
Q1:	— Describe the chemical nature of hormone by giving the example of important hormones.	
	<u>Answer:-</u> See Question No-2.	
Q2:	— Explain the role of hormones secreted by anterior lobe of pituitary.	
	<u>Answer:-</u> See Question No-3. < write only anterior lobe >.	
Q3:	— Discuss the regulation of calcium level in the body also — discuss the effects of hypercalcemia and hypocalcemia.	
	<u>Answer: Regulation of Ca^{+2} level:</u>	
	In regulation of Ca^{+2} level the following hormones play imp; role	
	1: <u>Function of calcitonin:-</u> < write from Q-4 — last part only >	
	2: <u>Function of parathyrome:-</u> < write from Q-5, only function >	
	<u>Effects of Hypo-calcemia:-</u> < write from Q-5, only hypocalcemia >	
	<u>Effects of hypercalcemia:-</u> < write from Q-5, only hypercalcemia >	
Q4:	— Describe the hormone involve in the regulation of — Reproductive functions.	

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<u>Answers :-</u> See Question No-8 (Estrogen, progesterone, testosterone) Q5: —analyze the phenomenon of feedback mechanism by taking an appropriate example from chemical coordination. <u>Answer :-</u> See Question No-9. (write only — Definition , Explanation and negative feedback mechanism with example)			
End			
<u>Note : <Summary> :-</u>			
Gland	Hormone	Functions	
Anterior lobe of Pituitary gland	- Growth hormone - Adrenocorticotrophic hormone - Thyroid stimulating hormone - Luteinising hormone	- regulates development of muscles and bones - stimulates secretion of cortisol and aldosterone by the adrenal cortex - stimulates the thyroid gland to produce its hormone - stimulates the ovary to release egg - stimulates the testes to produce testosterone	
Posterior lobe of Pituitary gland	- Antidiuretic hormone - Oxytocin	- increases the reabsorption of water from nephrons - initiates uterine contractions during childbirth - stimulates the flow of milk from the breasts during lactation	
Thyroid gland	- Thyroxine - Calcitonin	- stimulates enzymes of cellular metabolism - decreases blood calcium concentration	
Adrenal medulla	- Epinephrine, - Norepinephrine	initiate body's response to stress and the "fight or-flight" response to danger	
Adrenal cortex	- Cortisol - Aldosterone	- promotes production of glucose from proteins - promotes salt and water retention by the kidneys	
Pancreas	- Insulin - Glucagon	- lowers the blood glucose level by stimulating body cells to store glucose or use it - stimulates release of glucose from the liver into the blood	
Ovaries	- Oestrogen - Progesterone	cause the release of an egg from the ovary and regulates female secondary sex characteristics	
Testes	Androgens (Testosterone)	regulate male secondary sex characteristics	

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Previous Entry Test MCQ's of Biology Chapter No -18: (Chemical coordination)		
2005 ETEA		
1. Hyper functioning of thyroid gland will cause: (a) Enlargement of bones (b) Slow heart rate and nervousness (c) Loss of body weight (d) Sexual precocity		(a) Protein hormones (b) Non steroid hormones (c) Steroid hormones (d) Peptide hormones
2. Cortisone is an important hormone of: (a) Adrenal cortex (b) Adrenal medulla (c) Cerebral cortex (d) Cerebral medulla		9. The rate of metabolism is regulated by: (a) PTF (b) Thyroxin (c) Aldosterone (d) Calcitonin
3. Increase secretion of antidiuretic hormone is due to: (a) Decrease water supply (b) Kidney disorder (c) Homeostatic (d) Increase water supply		2012 ETEA
4. Goiter is caused by deficiency of: (a) Sodium in water (b) Calcium in water (c) Iodine in water (d) Sugar in water		10. Steroid Hormones are produces by: (a) Testes and ovaries (b) Adrenal glands and gonads (c) Adrenal cortex and gonads (d) Gonads and thyroids
5. Which hormones prepare the body for Situations of stress and emergency? (a) Adrenaline (b) Nor adrenaline (c) Thyroxin (d) Insulin		11. Insulin is produced by: (a) Alpha-cells (b) Beta-cells (c) Delta-cells (d) Gamma-cells
2006 ETEA		12. The hormone released by the posterior Pituitary gland that stimulates the Contraction of uterine muscles and mammary gland is called: a) Prolactin b) LH c) FSH d) Oxytocin
6. First crystalline hormone is: (a) Thyroxin (b) Nor adrenalin (c) Adrenalin (d) All of the above		2014 ETEA
7. Which of the following is composed of lipids? (a) Some hormones (b) Enzymes (c) Skin tendons (d) Insulin		13. which of the following play role in biorhythm? a) MSH b) LH c) ADH d) Melatonin
2010 ETEA		14. Deficiency of which of the following causes diuresis? a) LH b) ACTH c) FSH d) ADH
8. Hormones produced from cholesterol are called:		2015 ETEA
2011 ETEA		15. A condition of excessive thirst due to a). polyuria b). glycosuria c). polyphagia d). polydipsia
		2016 ETEA
		16. Which of the following statement is correct? a) High concentration of ADH increase blood pressure b) High concentration of ADH decreases blood pressure c) High concentration of ADH does not affect blood pressure

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ETEA-MCQs

d) High concentration of ADH bring blood pressure to normal

17. Which of the following is non-steroidal hormone?

a) Cortisol b) Testosterone
c) Insulin d) Aldosterone

18. Release of calcium from bone into blood is controlled by:

a) Parathormone b) Calcitonin
c) Thyroxine d) Both A and B

19. Exophthalmia is a classic symptom of:

a) Hyperthyroidism b) Hypocalcaemia
c) Hypochondria d) Hyperglycemia

2017 ETEA

20. The deficiency of calcitonin result in?

(a) Bone formation (b) Kidney stone
(c) Hyperthyroidism (d) Hypothyroidism

2018 ETEA

21. Goblets cells are:

(a) Unicellular exocrine gland
(b) Unicellular endocrine glands
(c) Multicellular exocrine gland
(d) Multicellular endocrine glands

22. Which factor is not involved in release of oxytocin in females?

(a) Stretching of uterus
(b) Stretching of Cervix
(c) Low level of testosterone
(d) Low level of progesterone

2019 ETEA

23. A man has to face interview, but during his first five minutes before the interview he experiences sweating, increased heart rate and respiration. Which hormone is responsible for his restlessness?

(a) Adrenocorticotrophic hormone
(b) Insulin and glucagon

(c) Epinephrine and norepinephrine
(d) Aldosterone

24. Hypothalamus connected to pituitary gland via:

(a) Nerves (b) Infundibulum
(c) Blood (d) No connection

25. Find mismatch:

(a) Thyroid gland- T_3 and T_4
(b) Parathyroid gland- calcitonin
(c) Pancreas- insulin
(d) Gonads- Testes and ovaries

26. Chemically hormones are:

(a) Carbohydrates (b) Proteins
(c) Steroids (d) Both b and c

27. Glucose is converted in the liver to glycogen in response to the hormone:

(a) Glucagon (b) Insulin
(c) Bile (d) Both a and b

28. In male luteinizing hormone also known as.

(a) ACTH (b) ICSH (c) TRF (d) MSH

29. The deficiency of which micronutrient cause goiter formation?

(a) Iron (b) Zinc (c) Iodine (d) Na^+

30. A condition in which abnormally large volume of urine is produced is:

(a) Polydipsia (b) Polyuria
(c) Polyphagia (d) Polyanypsida

2020 ETEA

31. Which body function is controlled through positive feedback mechanism?

a. Labour contractions b. Body temp;
c. Insulin production d. Thyroxin release

Key:

1.c	2.a	3.a	4.c	5.a	6.a
7.a	8.c	9.b	10.c	11.b	12.d
13.d	14.d	15.d	16.a	17.c	18.a
19.a	20.b	21.a	22.c	23.c	24.b
25.b	26.d	27.c	28.b	29.c	30.b
31.a					

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