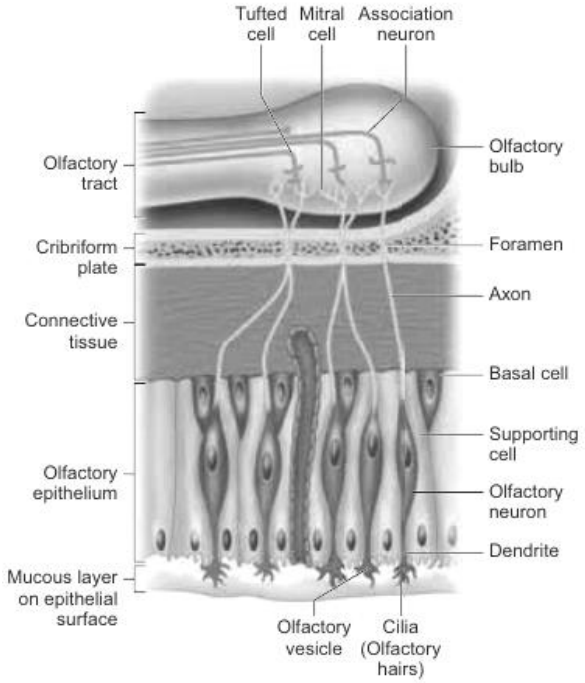


*It contains three types of cells**: supporting cells, Basal cells** and millions of pin shaped **olfactory receptor cells** (which are unusual bipolar cells).

*The olfactory glands and the supporting cells secrete the mucus. The unmyelinated axons of the olfactory receptor cells are gathered to form the filaments of olfactory nerve [cranial nerve I] which synapse with cells of olfactory bulb.

*The impulse, through the olfactory nerves, is transmitted to the frontal lobe of the brain for identification of smell and the limbic system for the emotional responses to odour.

CHAPTER-11 CHEMICAL CO-ORDINATION AND INTEGRATION

Evaluation

1. The maintenance of constant internal environment is referred as
a. Regulation **b. homeostasis** c. co-ordination d. hormonal control
2. Which of the following are exclusive endocrine glands?
a. Thymus and testis b. adrenal and ovary
c. parathyroid and adrenal d. pancreas and parathyroid
3. Which of the following hormone is not secreted under the influence of pituitary gland?
a. thyroxine **b. insulin** c. oestrogen d. glucocorticoids
4. Spermatogenesis in mammalian testes is controlled by
a. Luteinising hormone **b. Follicle stimulating hormone**
c. FSH and prolactin d. GH and prolactin
5. Serum calcium level is regulated by
a. Thyroxine b. FSH
c. Pancreas **d. Thyroid and parathyroid**
6. Iodised salt is essential to prevent
a. rickets b. scurvy **c. goitre** d. acromegaly
7. Which of the following gland is related with immunity?
a. Pineal gland b. adrenal gland **c. thymus** d. parathyroid gland
8. Which of the following statement about sex hormones is correct?
a. Testosterone is produced by Leydig cells under the influence of luteinizing hormone

b. Progesterone is secreted by corpus luteum and softens pelvic ligaments during child birth
c. Oestrogen is secreted by both sertoli cells and corpus luteum
d. Progesterone produced by corpus luteum is biologically different from the one produced by placenta.
9. Hypersecretion of GH in children leads to
a. Cretinism **b. Gigantism** c. Graves disease d. Tetany
10. A pregnant female delivers a baby who suffers from stunted growth, mental retardation, low intelligence quotient and abnormal skin. This is the result of
a. Low secretion of growth hormone
b. Cancer of the thyroid gland
c. Over secretion of pars distalis
d. Deficiency of iodine in diet.
11. The structure which connects the hypothalamus with anterior lobe of pituitary gland is the
a. Dendrites of neuro hypophysis b. Axons of neurohypophysis
c. Bands of white fibers from cerebellar region **d. Hypophysial portal system**
12. Comment on homeostasis.
Homeostasis is the tendency to resist change in order to maintain a stable, relatively constant internal environment.
Homeostasis typically involves negative feedback loops that counteract changes of various properties from their target values, known as set points.
Humans' internal body temperature is a great example of homeostasis. When an individual is healthy, his or her body temperature retains a temperature 98.6 degrees Fahrenheit.
The body can control temperature by making or releasingheat. ... The maintenance of healthy blood pressure is an example of homeostasis
13. Which one of the following statement is correct
a. Calcitonin and thymosin are thyroid hormones
b. Pepsin and prolactin are secreted in stomach
c. Secretin and rhodopsin are polypeptide hormones
d. Cortisol and aldosterone are steroid hormones
14. which of the given option shows all wrong statements for thyroid gland
Statements
(i) It inhibits process of RBC formation
(ii) It helps in maintenance of water and electrolytes
(iii) Its more secretion can reduce blood pressure
(iv) It Stimulates osteoblast
(a) (i) and (ii) (b) (iii) and (iv)
(c) (i) and (iv) (d) (i) and (iii)
15. Hormones are known as chemicalmessenger. Justify.

Hormones are chemical messengers because they act as organic catalysts and coenzymes to perform specific functions in the target organs. The target organs contain receptor molecules either on the surface or within the cell. Although different hormones come in contact with cells, only the cells that contain receptor molecules specific for the hormone are physiologically activated. A single hormone may have multiple effects on a single target tissue or on different target tissues.

Many hormones exhibit long term changes like growth, puberty and pregnancy. Hormones often influence many organs and organ systems at the same time. Serious deficiency or excess secretion of hormones leads to disorders. Hormones coordinate different physical, physiological, mental activities and

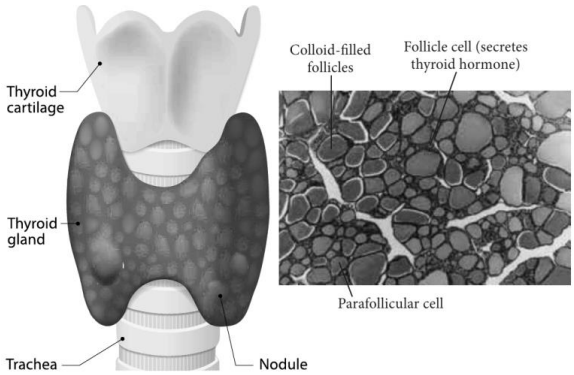
Homeostasis: Maintenance of constant internal environment of the body by the different coordinating system.

16. Write the role of oestrogen in ovulation.

*it is secreted by ovaries.
*it operates with L.H to encourage the development of the small follicles in the ovaries.
*FSH also stimulates the production of ovarian hormone oestrogen.
*it stops production of fsh so that only one egg matures in a cycle.
* It stimulates ovulation and development of corpus luteum.
*ovulation is the release of egg from the ovary by rupture of follicular cells.

17. Comment on Acini of thyroid gland.

*The butterfly shaped thyroid gland is a bilobed gland located below the larynx on each side of upper trachea. It is the largestendocrine gland in the body. Its two lateral lobes are connected by a median tissue mass called **isthmus**.



*Each lobe is made up of many lobules .The lobules consist of follicles called **acini (acinus in singular)**. Each acinus is lined with glandular, cuboidal or squamous epithelial cells. Thelumen of acinus is filled with colloid, a thick glycoprotein mixture consisting of thyroglobulin molecules.

18. Write the causes for diabetes mellitus and diabetes insipidus.

***Hyperglycaemia** is otherwise known as **Diabetes mellitus**. It is caused due to reduced secretion of insulin. As the result, blood glucose level is elevated.
*Diabetes mellitus is of two types, **Type I Diabetes** and **Type II Diabetes**.
*Type I diabetes isalso known Insulin dependent diabetes,caused by the lack of insulin secretion due to illness or viral infections.
*Type II diabetes is also known as Non- Insulin dependent diabetes, caused due to reduced sensitivity to insulin, often called as insulin resistance.
*Symptoms of diabetes includes, polyurea (excessive urination), polyphagia (excessive intake of food), polydipsia (excessive consumption liquids due to thirst), ketosis (breakdown of fat into glucose results in accumulation of ketone bodies) in blood.
*Gluconeogenesis (Conversion of non- carbohydrate form like amino acids and fat into glucose) also occur in diabetes.
***Diabates insipidus** is caused due to hyposecretion of vasopressin (ADH) from neurohypophysis.
*The symptom includes frequent urination (polyurea) and excessive consumption of liquids due to thirst (polydipsia).

19. Specify the symptoms of acromegaly.

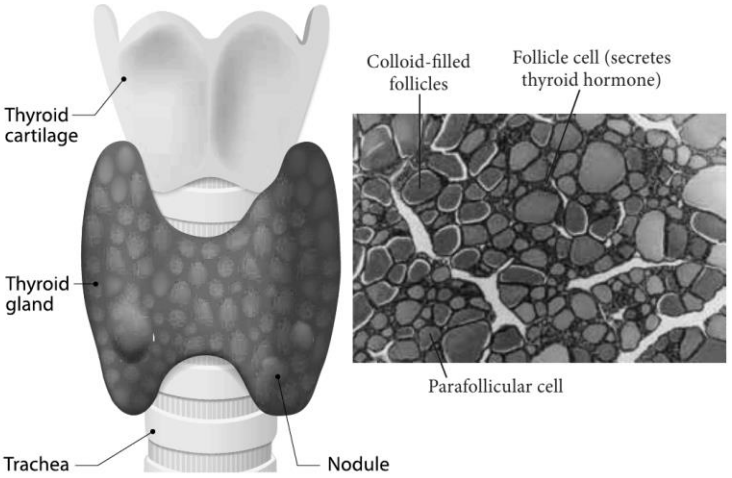
Acromegaly is due to excessive secretion of growth hormone in adults. Over growth of hand bones, feet bones, jaw bones, malfunctioning of gonads, enlargement of viscera, tongue, lungs, heart, liver, spleenand endocrine gland like thyroid, adrenal etc., are the symptoms of acromegaly.

20. Write the symptoms of cretinism.

In infants, hypothyroidism causes **cretinism.** A cretin shows retarded skeletal growth, absence of sexual maturity, retarded mental ability, thick wrinkled skin, protruded enlarged tongue, bloated face, thick and short limbs occurs. The other symptoms are low BMR, slow pulse rate, subnormal body temperature and elevated blood cholesterol levels.

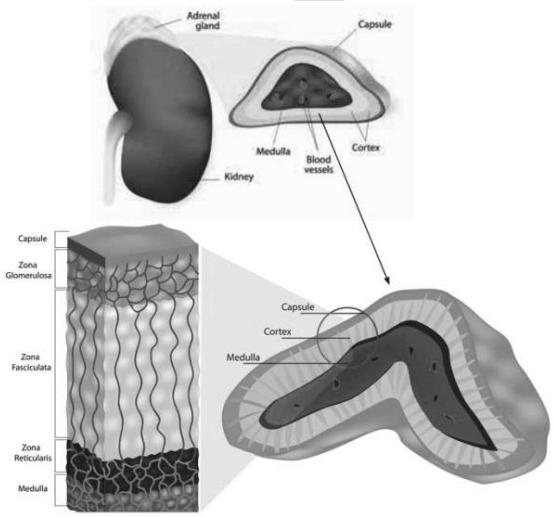
21. Briefly explain the structure of thyroid gland.

The butterfly shaped thyroid gland is a bilobed gland located below the larynx on each side of upper trachea. It is the largestendocrine gland in the body. Its two lateral lobes are connected by a median tissue mass called **isthmus**. Each lobe is made up of many lobules .The lobules consist of follicles called **acini (acinus in singular)**.



Each acinus is lined with glandular, cuboidal or squamous epithelial cells. Thelumen of acinus is filled with colloid, a thick glycoprotein mixture consisting of thyroglobulin molecules. Hormones of the thyroid gland are often called the major metabolic hormones. The follicular cells of thyroid gland secrete two hormones namely tri-iodothyronine (T3) and thyroxine or tetra iodothyronine(T4). The parafollicular cells or 'C' cells of thyroid gland secrete a hormone called thyrocalcitonin. Iodine is essential for the normal synthesis of thyroid hormones. Thyroid releasing hormone from the hypothalamus stimulates the adenohypophysis to secrete TSH, which inturn stimulates the thyroid gland to secrete the thyroid hormones. Thyroid hormones show a negative feedback effect on the hypothalamus and pituitary.

22. Name the layers of adrenal cortex and mention their secretions.



*A pair of adrenal glands are located at the anterior end of the kidneys, hence also called suprarenal glands.
*Anatomically the outer region is the cortex and the inner region is the medulla. Histologically the adrenal cortex has three distinct zones, zona glomerulosa, zona fasciculata and zona reticularis.
Zona glomerulosa an outer thin layer constitutes about 15% of adrenal cortex, and secretes mineralocorticoids.
Zona fasciculata, the middle widest layer constitutes about 75% of adrenal cortex and secretes glucocorticoids such as cortisol, corticosterone and trace amounts of adrenal androgen and oestrogen.
Zonareticularis, an inner zone of adrenal cortex constitute about 10% of adrenal cortex and secretes the adrenal androgen, trace amount of oestrogen and glucocorticoids.

23. Differentiate hyperglycemia from hypoglycemia.

Hypoglycaemia is due to increased secretion of insulin thereby blood glucose level decreases. In this disorder blood glucose level lowers than normal fasting index. Increased heartbeat, weakness, nervousness, headache, confusion, lack of co-ordination, slurred speech, serious brain defects like epilepsy and coma occurs.
Hyperglycaemia is otherwise known as **Diabetes mellitus**. It is caused due to reduced secretion of insulin. As the result, blood glucose level is elevated. Diabetes mellitus is of two types, **Type I Diabetes** and **Type II Diabetes**. Type I diabetes is also known Insulin dependent diabetes, caused by the lack of insulin secretion due to illness or viral infections. Type II diabetes is also known as Non- Insulin dependent diabetes, caused due to reduced sensitivity to insulin, often called as insulin resistance. Symptoms of diabetes includes, polyurea (excessive urination), polyphagia (excessive intake of food), polydipsia (excessive consumption liquids due to thirst), ketosis (breakdown of fat into glucose results in accumulation of ketone bodies) in blood. Gluconeogenesis (Conversion of non- carbohydrate form like amino acids and fat into glucose) also occur in diabetes.

24 .Write the functions of (CCK) Cholecystokinin.

***Cholecystokinin (CCK)** is secreted by duodenum in response to the presence of fat and acid in the diet.
*It acts on the gall bladder to release bile into duodenum and stimulates the secretion of pancreatic enzymes and its discharge.

25. Growth hormone is important for normal growth. Justify the statement.

Hormones of Adenohypophysis

Growth hormone (GH): It is also known as somatotropic hormone (STH) or Somatotropin. It is a peptide hormone.
Growth hormone promotes growth of all the tissues and metabolic process of the body. It influences the metabolism of carbohydrates, proteins and lipids and increases the rate of protein biosynthesis in the cells. It stimulates chondrogenesis (cartilage formation), osteogenesis (bone formation) and helps in the retention of minerals like nitrogen, potassium, phosphorus, sodium etc., in the body.
GH increases the release of fatty acid from adipose tissue and decreases the rate of glucose utilization for energy by the cells. Thus it conserves glucose for glucose dependent tissues, such as the brain.

26. Pineal gland is an endocrine gland,write its role.

In human, the pineal gland or epiphysis cerebri or conarium is located behind the third ventricle of brain and is formed of parenchymal cells and interstitial cells. It secretes the hormone, **melatonin**, which plays a central role in the regulation of circadian rhythm of our body and maintains the normal sleep wake cycle.
It also regulates the timing of sexual maturation of gonads. In addition melatonin also influences metabolism, pigmentation, menstrual cycle and defence mechanism of our body.

27. Comment on the functions of adrenalin.

The **adrenal medulla** secretes the hormones adrenalin and noradrenalin and are referred as "3F hormone" (fight, flight and fright hormone). Adrenalin increases liver glycogen breakdown into glucose and increases the release of fatty acids from fat cells. During emergency it increases heart beat rate and blood pressure. It stimulates the smooth muscles of cutaneous and visceral arteries to decrease blood flow. It increases blood flow to the skeletal muscles thereby increases the metabolic rate of skeletal muscles, cardiac muscles and nervous tissue.

28. Predict the effects of removal of pancreas from the human body.

The pancreas is a gland that secretes hormones that a person needs to survive, including insulin. Decades ago, serious problems with the pancreas were almost always fatal. Now, it is possible for people to live without a pancreas.

Surgery to remove the pancreas is called pancreatectomy. The surgery can be partial, removing only the diseased portion of the pancreas, or a surgeon may remove the entire pancreas.

A complete pancreatectomy that removes the entire pancreas also requires the removal of parts of the stomach, a portion of the small intestine called the duodenum, and the end of the bile duct. The gallbladder and the spleen may be removed as well.

This extensive surgery can be dangerous and life-changing. After a pancreatectomy, a person will develop diabetes. They need to change their diet and lifestyle and will have to take insulin for the rest of their lives.

People who cannot produce enough insulin develop diabetes, which is why removing the pancreas automatically triggers the condition.

Removing the pancreas can also reduce the body's ability to absorb nutrients from food. Without artificial insulin injections and digestive enzymes, a person without a pancreas cannot survive.

One 2016 study found that about three-quarters of people without cancer survived at least 7 years following pancreas removal. Among those with cancer, 7-year survival rates ranged from 30-64 percent, depending on the type of cancer they had and the degree to which it had spread.

29. Enumerate the role of kidney as an endocrine gland.

*Some tissues of the heart, kidney and gastro intestinal tract acts as partial endocrine glands. In kidneys, hormones such as renin, erythropoietin and calcitriol are secreted. **Renin** is secreted by juxta glomerular cells

*(JGA), which increases blood pressure when angiotensin is formed in blood. **Erythropoietin** is also secreted by the JGA cells of the kidney and stimulates erythropoiesis (formation of RBC) in bone marrow.

*__Calcitriol__ is sercreted by proximal tubules of nephron. It is an active form of vitamin D3 which promotes calcium and phosphorus absorption from intestine and accelerates bone formation.

30. Write a detailed account of gastro intestinal tract hormones.

Gastro intestinal tract hormones

Group of specialized endocrine cells present in gastro-intestinal tract secretes hormones such as gastrin, cholecystokinin (CCK), secretin and gastric inhibitory peptides (GIP). **Gastrin** acts on the gastric glands and stimulates the secretion of HCl and pepsinogen.

Cholecystokinin (CCK) is secreted by duodenum in response to the presence of fat and acid in the diet. It acts on the gall bladder to release bile into duodenum and stimulates the secretion of pancreatic enzymes and its discharge.

Secretin acts on acini cells of pancreas to secrete bicarbonate ions and water to neutralize the acidity.

Gastric inhibitory peptide (GIP) inhibits gastric secretion and motility.

CHAPTER-12 TRENDS IN ECONOMIC ZOOLOGY

Evaluation

1. Which one of the following is not related to vermiculture?

a. Maintains soil fertility

b. Breakdown of inorganic matter

c. Gives porosity, aeration and moister holding capacity

d. Degradation of non biodegradable solid waste

a. a and b is correct

b. c and d is correct

c. b and d is not correct

d. a and c is not correct

2. Which one of the following is not an endemic species of earthworm?

a. *Perionyx* a. *Lampito* **b. *Eudrillus*** c. *Octochaetona*

3. Match the following

1. *Bombyx mori* - a) Champa - I) Muga

2. *Antheraea assamensis* - b) Mulberry - II) Eri

3. *Antheraea mylitta* - c) Arjun - III)Tassar

4. *Attacus ricini* - d) Castor - IV) Mulberry

Select the correct one.

A) 1 – b – IV B) 2 – a – I C) 3 - c - III D) 4 - d - II

4. Silk is obtained from ….

a. *Laccifer lacca*

b. *Nosema bombycis*

c. *Attacus ricini*

d. *Attacus mylitta*

5. **Assertion*:*** Nuptial flight is a unique flight taken the queen bee followed by several drones.

Reason: The queen bee produces a chemical substance called pheromone.

The drones in that area are attracted to the pheromone and then mating takes place.

a. Assertion and reason is correct but not related

b. Assertion and reason is incorrect but related

c. Assertion and reason is correct but related

d. Assertion and reason is incorrect but not related

6. Rearing of honey bee is called

a. Sericulture b. Lac culture c. Vermiculture **d. Apiculture**

7. Which of the statement regarding Lac insect is TRUE?

a. A microscopic, resinous crawling scale insect

b. Inserts its proboscis into plant tissue suck juices and grows