Chapter – 11

Chemical Coordination and Integration

Textbook Evaluation Solved

Question 1.
The maintenance of constant internal environment is referred as .
(a) Regulation
(b) Homeostasis
(c) Co-ordination
(d) Hormonal control

Answer:
(b) Homeostasis

Question 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

Answer:
(c) Parathyroid and adrenal

Question 3.
Which of the following hormone is not secreted under the influence of pituitary gland?
(a) Thyroxine
(b) Insulin
(c) Oestrogen
(d) Glucocorticoids

Answer:
(A) Insulin

Question 4.
Spermatogenesis in mammalian testes is controlled by?
(a) Luteinising hormone
(b) Follicle stimulating hormone
(c) FSH and prolactin
(d) GH and prolactin

Answer:
(a) Follicle stimulating hormone

Question 5.
Serum calcium level is regulated by?
(a) Thyroxine
(b) FSH
(c) Pancreas Assertion is true, but Reason is false
(d) Thyroid and parathyroid

Answer:
(d) Thyroid and parathyroid

Question 6.
Iodised salt is essential to prevent?
(a) Rickets
(b) Scurvy
(c) Goitre
(d) Acromegaly

Answer:
(c) Goitre

Question 7.
Which of the following gland is related with immunity?
(a) Pineal gland
(b) Adrenal gland
(c) Thymus
(d) Parathyroid gland

Answer:
(c) Thymus

Question 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.

Answer:
(a) Testosterone is produced by Leydig cells under the influence of luteinizing hormone

Question 9.
Hypersecretion of GH in children leads to
(a) Cretinism
(b) Gigantism
(c) Graves disease
(d) Tetany

Answer:
(b) Gigantism

Question 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.

Answer:
(b) Cancer of the thyroid gland

Question 11.
The structure which connects the hypothalamus with the anterior lobe of the pituitary gland is the
(a) Dendrites of the neurohypophysis
(b) Axons of the neurohypophysis
(c) Bands of white fibers from the cerebellar region
(d) Hypophysial portal system

Answer:
(b) Axons of the neurohypophysis

Question 12.
Comment on homeostasis?

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

Question 13.
Which one of the following statement is correct
(a) Calcitonin and thymosin are thyroid hormones
(b) Pepsin and prolactin are selected in the stomach
(c) Secretin and rhodopsin are polypeptide hormones
(d) Cortisol and aldosterone are steroid hormones

Answer:
(d) Cortisol and aldosterone are steroid hormones

Question 14.
Which of the given option shows all wrong statement for thyroid gland
Statements
(i) It inhibits the process of RBC formation
(ii) It helps in the maintenance of water and electrolytes
(iii) It's 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)

Answer:
(c) (i) and (iv)

Question 15.
Hormones are known as chemical messengers? Justify?

Answer:
Hormones are chemical messengers because they act as organic catalysts and co-enzymes to perform specific functions in the target organs.

Question 16.
Write the role of oestrogen in ovulation?

Answer:
Oestrogen is the ovarian hormone secreted during the proliferation phase of the menstrual cycle from the 6th day to the 14th day of the cycle. On the 14th day of the cycle, under the influence of luteinizing hormone, the ovum is released from the graffian follicles. This process is known as ovulation.

Question 17.
Comment on Acini of thyroid gland?

Answer:

- The thyroid gland is a bilobed gland. Each lobe is made up of many lobules.
- The lobules consist of follicles called acinus. Each acinus is lined with glandular cuboidal or squamous epithelial cells.
- The lumen of the acinus is filled with colloid which contains thyroglobulin molecules.

Question 18.
Write the causes for diabetes mellitus and diabetes insipid?

Answer:
Diabetes mellitus is caused due to reduced secretion of insulin. As a result, the

blood glucose level is elevated. Diabetes insipidus is caused due to under secretion of ADH or vasopressin. As a result, reabsorption of water gets affected and hence large amount of urine is produced.

Question 19.
Specify the symptoms of acromegaly?

Answer:
Acromegaly is due to excessive secretion of growth hormone in adults. The symptoms are an overgrowth of hand bones, feet bones, Jawbones malfunctioning of gonads enlargement of Viscera. Tongue, lungs, heart, liver spleen, thyroid, and adrenal gland.

Question 20.
Write the symptoms of cretinism?

Answer:
Cretinism is caused due to hypothyroidism in infants. A cretin child shows the following symptoms:-

1. Retarded skeletal growth.
2. Absence of sexual maturity
3. Retarded mental ability
4. Thick and short limbs
5. Thick wrinkled skin
6. Bloated face
7. Protruded enlarged tongue
8. Low BMR, slow pulse rate, subnormal body temperature, and elevated blood cholesterol levels

Question 21.
Briefly explain the structure of the thyroid gland?

Answer:

- It is the largest endocrine gland.
- The thyroid gland is a butterfly-shaped bi-lobed gland located below the larynx on each side of the upper trachea.

- The 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.
- Each animus is lined with glandular cuboidal squamous epithelial cells.
- The lumen of the acinus is filled with colloid a thick glycoprotein mixture consisting of thyroglobulin molecules.

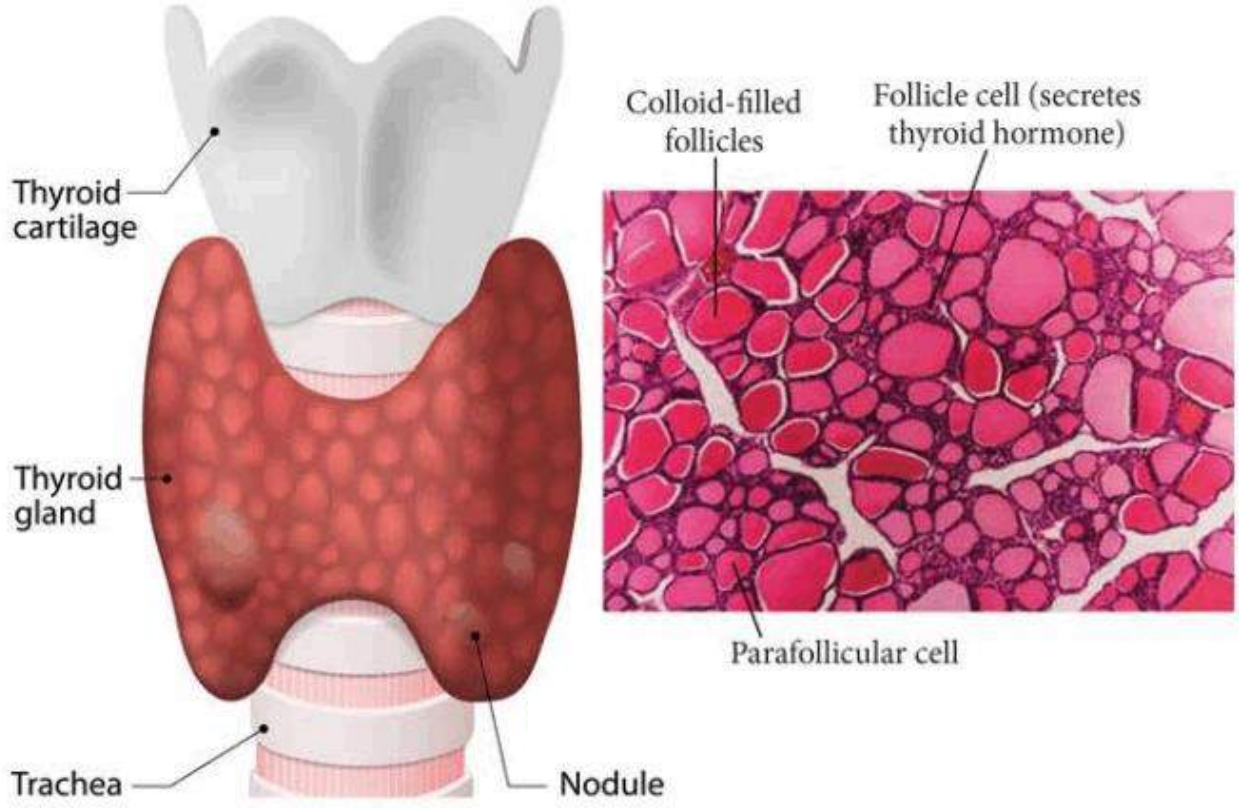

Figure.11. 3 Structures of thyroid gland

Question 22.

Name the layers of the adrenal cortex and mention their secretions?

Answer:

A pair of adrenal glands are located at the anterior end of the kidneys. Hence, they are called suprarenal glands. The outer region is called the cortex and the inner region is the medulla. The adrenal cortex has three distinct zones,

1. Zona Glomerulosa
2. Zona fasciculata

3. Zona reticularis

1. Zona Glomerulosa:

- It is the outer thin layer. It constitutes about 15% of the cortex.
- It secretes mineralocorticoids.

2. Zona fasciculata:

- It is the middle wide layer constituting about 15% of adrenal cortex.
- It secretes glucocorticoids such as cortisol, corticosterone and trace amounts of adrenal androgen and oestrogen.

3. Zona reticularis:

- It is the inner zone of adrenal cortex.
- It constitutes about 10% of adrenal cortex.
- It constitutes about 10% of adrenal cortex.
- It secretes the adrenal androgen, trace amount of oestrogen and glucocorticoids.

Question 23.
Differentiate hyperglycemia from hypoglycemia?

Answer:

Hyperglycemia	Hypoglycemia
1. Elevation in the blood sugar level is called hyperglycemia	1. Decrease in the blood sugar level is called hypoglycemia.
2. This happens due to reduced secretion of insulin.	2. This happens due to increased secretion of insulin.

Question 24.
Write the functions of CCK cholecystokinin?

Answer:
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.

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

Answer:
Growth hormone promotes growth of all the tissues and metabolic process of the body. It influences the metabolism of carbohydrate, proteins and lipids. It 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. It increases the release of fatty acid from adipose tissue and decreases the rate of glucose utilization for energy by the cells. The hyposecretion of growth hormones causes dwarfism in children.

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

Answer:

- As pineal gland secretes the hormone melotonin it is an endocrine gland.
- Melotonin hormone 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.
- Melatonin also influences metabolism pigmentation menstrual cycle and defence mechanism of our body.

Question 27.
Comment on the functions of adrenalin?

Answer:
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. lt stimulates the smooth muscles of cutaneous and visceral arteries to decrease blood flow. It increases blood flow to the skeletal muscles and nervous tissue.

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

Answer:

- Surgical removal of pancreas is due to some clinical reasons is known as pancreatectomy.
- The following are the effect of pancreatectomy.
- There may be hypoglycemic and hyperglycemic manifestation. As there is a complete absence of endogenous insulin and glycogen leads to pancreatic diabetic mellitus. There may be anastomatic ulcer.
- There may be low level of fat souble vitamin.
- There may be weight loss
- There may be chronic diarrohea
- There may be loss of appetite
- There may be fatiqueness and vomiting, Elevated cholesterol level
- There may be poor life expectancy.
- There may be physical emotional cognitive and social functional declining. 30. Write a detailed account of gastrointestinal tract hormones.
- These are specialized endocrine cells present in gastro-intestinal tract secretes hormones such as gastrin cholecystokinin secretin and gastric inhibitory peptides.
- Gastrin acts on the gastric glands and stimulates the secretion of HC1 and Pepsinogen.
- Cholecystokinin is secreted by duodenum in response to the presence of fat and acid in the diet.
- It acts on the gall bladder to release in to duodenum and stimulates the secretion of pancreatic enzymes and its discharge.
- Secretion 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.

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

Answer:
Kidney has endocrine tissues which act as partial endocrine gland. It secretes renin, erythropoietin and calcitripl. Renin is secreted by juxta glomerular cells. It increases blood pressure when angiotensin is formed in blood.

Erythropoietin is also secreted by the juxta glomerular cells of the kidney and stimulates erythropoieis in bone marrow. Calcitriol is secreted by proximal tubes of nephrons. It is an active form of vitamin D3 which promotes calcium and phosphorus absorption from intestine and accelerates bone formation.

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

Answer:
Group of specialized endocrine cells present in gastro-intestial 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 HC1 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.