# Chemical Coordination and Integration

# Question1

## Match List-I with List-II.

| | List-I | | List-II |
|---|---|---|---|
| A. | Epinephrine | I | Hyperglycemia |
| B. | Thyroxine | II | Smooth muscle contraction |
| C. | Oxytocin | III | Basal metabolic rate |
| D. | Glucagon | IV | Emergency hormone |

## Choose the correct answer from the options given below :

## [NEET 2024 Re]

**Options:**

A.

A-II, B-I, C-IV, D-III

B.

A-III, B-II, C-I, D-IV

C.

A-IV, B-III, C-II, D-I

D.

A-I, B-IV, C-III, D-II

**Answer: C**

## Solution:

The correct answer is option (3) because

• Epinephrine is an emergency hormone, also known as adrenaline and is secreted from adrenal medulla.

• Thyroxine is secreted from thyroid gland and plays an important role in regulation of basal metabolic rate.

• Oxytocin is a peptide hormone synthesised by hypothalamus and released by posterior pituitary. It causes smooth muscle contraction.

• Glucagon is secreted from α -cells of pancreas, acts mainly on hepatocytes and stimulates glycogenolysis resulting in an increased blood sugar level or hyperglycemia.

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# Question2

## Identify the wrong statements :

**A. Erythropoietin is produced by juxtaglomerular cells of the kidney**
**B. Leydig cells produce Androgens**
**C. Atrial Natriuretic factor, a peptide hormone is secreted by the seminiferous tubules of the testes**
**D. Cholecystokinin is produced by gastrointestinal tract**
**E. Gastrin acts on intestinal wall and helps in the production of pepsinogen**

## Choose the most appropriate answer from the options given below :

## [NEET 2024 Re]

**Options:**

A.

D and E only

B.

A and B only

C.

C and E only

D.

A and C only

**Answer: C**

## Solution:

The correct answer is option (3), (C) and (E) only as both are wrong statements.

• Atrial natriuretic factor, a peptide hormone is secreted from the atria of the heart not by the seminiferous tubules of the testes.

• Gastrin acts on the gastric glands not on the intestinal wall and stimulates the secretion of hydrochloric acid and pepsinogen.

Rest statements (A), (B) and (D) are correct statements.

Option (1), (2) and (4) are incorrect because they have eitherone or two correct statements.

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# Question3

## Which of the following is not a steroid hormone?

## [NEET 2024]

**Options:**

A.

Cortisol

B.

Testosterone

C.

Progesterone

D.

Glucagon

**Answer: D**

## Solution:

The correct answer is option (4) as glucagon is a proteinaceous hormone secreted from pancreas.

Options (1), (2) and (3) are not correct as they are steroid in nature.

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# Question4

## Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R :
## Assertion A : FSH acts upon ovarian follicles in female and Leydig cells in male.
## Reason R : Growing ovarian follicles secrete estrogen in female while interstitial cells secrete androgen in male human being.

## In the light of the above statements, choose the correct answer from the options given below :

## [NEET 2024]

**Options:**

A.

Both A and R are true and R is the correct explanation of A

B.

Both A and R are true but R is NOT the correct explanation of A

C.

A is true but R is false

D.

A is false but R is true

**Answer: D**

## Solution:

The correct answer is option (4) as FSH is a gonadotropin affects ovarian follicles in females and causes their growth but in males LH affects Leydig cells leading to secretion of androgens.

Growing ovarian follicles secrete estrogen in females while interstitial cells secrete androgen in male human being.

Hence, Assertion is false and Reason is true.

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# Question5

## Match List I with List II :

| | List-I | | List-II |
|---|---|---|---|
| A. | Exophthalmic goiter | I. | Excess secretion of cortisol, moon face & hypergylcemia. |
| B. | Acromegaly | II. | Hypo-secretion of thyroid hormone and stunted growth. |
| C. | Cushing’s syndrome | III. | Hyper secretion of thyroid hormone & protruding eye balls. |
| D. | Cretinism | IV. | Excessive secretion of growth hormone. |

## Choose the correct answer from the options given below :

## [NEET 2024]

**Options:**

A.

A-I, B-III, C-II, D-IV

B.

A-IV, B-II, C-I, D-III

C.

A-III, B-IV, C-II, D-I

D.

A-III, B-IV, C-I, D-II

**Answer: D**

## Solution:

The correct answer is option no. (4) as

| | | | |
|---|---|---|---|
| A. | Exophthalmic goiter | III. | Hyper secretion of thyroid hormone and characterized by protruding eye balls |
| B. | Acromegaly | IV. | Excessive secretion ofgrowth hormone. |
| C. | Cushing’s syndrome | I. | Excess secretion of cortisol, moon face and hyperglycaemia |
| D. | Cretinism | II. | Hypo-secretion of thyroid hormone and characterized by stunted growth |

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# Question6

## Match List I with List II.

| List I | List II |
|---|---|
| A. CCK | I. Kidney |
| B. GIP | II. Heart |
| C. ANF | III. Gastric gland |
| D. ADH | IV. Pancreas |

## Choose the correct answer from the options given below :

## [NEET 2023]

**Options:**

A.

A-III, B-II, C-IV, D-I

B.

A-II, B-IV, C-I, D-III

C.

A-IV, B-II, C-III, D-I

D.

A-IV, B-III, C-II, D-I

**Answer: D**

## Solution:

**Solution:**

The correct answer is option (4) as
• Cholecystokinin (CCK) acts on both gall bladder and pancreas and stimulates the secretion of bile juice and pancreatic enzymes respectively.
• GIP inhibits gastric secretion and motility.
• Atrial Natriuretic Factor (ANF) is released from the atrial wall of our heart.
• Anti-diuretic hormone (ADH) acts mainly on the kidney and stimulates resorption of water and electrolytes by the distal tubules.

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# Question7

## Which of the following are NOT under the control of thyroid hormone?
## A. Maintenance of water and electrolyte balance
## B. Regulation of basal metabolic rate
## C. Normal rhythm of sleep-wake cycle
## D. Development of immune system
## E. Support the process of RBCs formation

## Choose the correct answer from the options given below:

## [NEET 2023]

**Options:**

A.

B and C only

B.

C and D only

C.

D and E only

D.

A and D only

**Answer: B**

## Solution:

Option (2) is the correct answer because thyroid hormones play an important role in the regulation of basal metabolic rate, maintenance of water and electrolyte balance and support the process of RBCs formation, whereas this hormone is not involved in regulating normal rhythm of sleep-wake cycle and development of immune system.

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# Question8

## Select incorrect statement, regarding chemical structure of insulin.

## [NEET 2023 mpr]

### Options:

A.

Mature insulin molecule consists of three polypeptide chains-A, B and C.

B.

Insulin is synthesized as prohormone which contains extra stretch of C-peptide.

C.

C-peptide is not present in mature insulin molecule.

D.

Polypeptide chains A and B are linked by disulphide bridges.

**Answer: A**

## Solution:

**The incorrect statement is :**

**Option A :** Mature insulin molecule consists of three polypeptide chains-A, B, and C.

The mature insulin molecule actually consists of only two polypeptide chains, A and B, which are linked by disulfide bridges. The C-peptide, or chain C, is present in the proinsulin molecule but is removed during the maturation process to produce the active form of insulin. Therefore, statements B, C, and D are correct.

# Question9

## Which of the following statements are correct with respect to the hormone and its function?
## (A) Thyrocalcitonin (TCT) regulates the blood calcium level.
## (B) In males, FSH and androgens regulate spermatogenesis.
## (C) Hyperthyroidism can lead to goitre.
## (D) Glucocorticoids are secreted in Adrenal Medulla.
## (E) Parathyroid hormone is regulated by circulating levels of sodium ions.

## Choose the most appropriate answer from the options given below :

## [NEET 2023 mpr]

**Options:**

A.

(C) and (E) only

B.

(A) and (B) only

C.

(B) and (C) only

D.

(A) and (D) only

**Answer: B**

## Solution:

(A) Thyrocalcitonin (TCT) regulates the blood calcium level.
This is correct. Thyrocalcitonin (or calcitonin) is a hormone produced by the thyroid gland that helps regulate levels of calcium and phosphorus in the blood.

(B) In males, FSH and androgens regulate spermatogenesis.
This is correct. FSH (Follicle Stimulating Hormone) stimulates the Sertoli cells to support spermatogenesis, and androgens (like testosterone) stimulate the development of male secondary sexual characteristics and are also necessary for spermatogenesis.

(C) Hyperthyroidism can lead to goitre.
This is incorrect. Goitre is typically caused by iodine deficiency or thyroid inflammation, not by hyperthyroidism. Hyperthyroidism is a condition where the thyroid gland is overactive and produces too much thyroid hormone.

(D) Glucocorticoids are secreted in Adrenal Medulla.
This is incorrect. Glucocorticoids, such as cortisol, are produced in the adrenal cortex, not the adrenal medulla.

(E) Parathyroid hormone is regulated by circulating levels of sodium ions.
This is incorrect. Parathyroid hormone is regulated by circulating levels of calcium ions, not sodium ions.

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# Question10

| List - I | | List - II | |
|---|---|---|---|
| (A) | Palm bones | (I) | Phalanges |
| (B) | Wrist bones | (II) | Metacarpals |
| (C) | Ankle bones | (III) | Carpals |
| (D) | Digit bones | (IV) | Tarsals |

## Choose the correct answer from the options given below :

## [NEET 2023 mpr]

**Options:**

A.

(A)-(II), (B)-(III), (C)-(I), (D)-(IV)

B.

(A)-(IV), (B)-(I), (C)-(II), (D)-(III)

C.

(A)-(III), (B)-(IV), (C)-(I), (D)-(II)

D.

(A)-(II), (B)-(III), (C)-(IV), (D)-(I)

**Answer: D**

## Solution:

A - Palm bones are associated with the Metacarpals (II)
B - Wrist bones are also known as Carpals (III)
C - Ankle bones are referred to as Tarsals (IV)
D - Digit bones, i.e., the bones in the fingers and toes, are the Phalanges (I)

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# Question11

## Given below are two statements :

## Statement I :
## Parathyroid hormone acts on bones and stimulates the process of bone resorption.

## Statement II :
## Parathyroid hormone along with Thyrocalcitonin plays a significant role in carbohydrate metabolism.
## In the light of the above statements, choose the correct answer from the options given below :

## [NEET 2023 mpr]

**Options:**

A.

Statement I is correct but Statement II is false

B.

Statement I is incorrect but Statement II is true

C.

Both Statement I and Statement II are true.

D.

Both Statement I and Statement II are false.

**Answer: A**

## Solution:

**Statement I :** Parathyroid hormone (PTH) indeed acts on bones and stimulates the process of bone resorption. It also acts on the kidneys to stimulate reabsorption of calcium, and on the intestines (indirectly via vitamin D activation) to enhance absorption of dietary calcium. All these actions increase the blood calcium levels.

**Statement II :** Parathyroid hormone and calcitonin (produced by the thyroid gland, not "Thyrocalcitonin") are key regulators of calcium homeostasis in the body. However, they do not play a significant role in carbohydrate metabolism. The key hormones involved in carbohydrate metabolism are insulin and glucagon, both produced by the pancreas. Therefore, Statement II is false.

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# Question12

## Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).
## Assertion (A):
## FSH which interacts with membrane bound receptors does not enter the target cell.
## Reason (R):
## Binding of FSH to its receptors generates second messenger (cyclic AMP) for its biochemical and physiological responses.
## In the light of the above statements, choose the most appropriate answer from the options given below:
## [NEET Re-2022]

**Options:**

A. (A) is not correct but (R) is correct

B. Both (A) and (R) are correct and (R) is the correct explanation of (A)

C. Both (A) and (R) are correct but (R) is not the correct explanation of (A)

D. (A) is correct but (R) is not correct

**Answer: C**

## Solution:

Option (3) is the correct answer as FSH is a peptide hormone, which is a lipid insoluble hormone. Lipid insoluble hormones cannot directly pass through the membranes and usually require membrane bound receptors for carrying out their activity.

Binding of hormones to membrane bound receptors generate second messenger for its biochemical and physiological responses.

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# Question13

## Which of the following are not the effects of Parathyroid hormone?
## (a) Stimulates the process of bone resorption
## (b) Decreases $Ca^{2+}$ level in blood
## (c) Reabsorption of $Ca^{2+}$ by renal tubules
## (d) Decreases the absorption of $Ca^{2+}$ from digested food
## (e) Increases metabolism of carbohydrates
## Choose the most appropriate answer from the options given below:
## [NEET-2022]

**Options:**

A. (a) and (c) only

B. (b), (d) and (e) only

C. (a) and (e) only

D. (b) and (c) only

**Answer: B**

## Solution:

**Solution:**

Option (2) is the correct answer because parathyroid hormone is a hypercalcemic hormone i.e, it increases the blood calcium levels. It also increases the absorption of calcium from digested food. Glucocorticoids regulate the carbohydrate metabolism.

Option (3) is not the answer because parathyroid hormone stimulates the process of bone resorption. Option (1) and (4) are not the answers because reabsorption of $\mathrm{mathrm}\ Ca^{2+}$ by renal tubules is a function of PTH.

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# Question14

## Erythropoietin hormone which stimulates R.B.C. formation is produced by:
## [NEET 2021]



**Options:**

A. Alpha cells of pancreas

B. The cells of rostral adenohypophysis

C. The cells of bone marrow

D. Juxtaglomerular cells of the kidney

**Answer: D**

## Solution:

● Option (4) is correct because Juxtaglomerular cells of kidney secrete erythropoietin hormone which stimulates RBC formation.
● Alpha cells of pancreas produce hormone glucagon.
● The cells of rostral adenohypophysis synthesizes hormones of anterior lobe of pituitary.
● The cells of bone marrow are responsible for formation of formed elements.

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# Question15

## Match the following columns and select the correct option.

| Column-I | Column-II |
|---|---|
| (a) Pituitary gland | (i) Grave's disease |
| (b) Thyroid gland | (ii) Diabetes mellitus |
| (c) Adrenal gland | (iii) Diabetes insipidus |
| (d) Pancreas | (iv) Addison's disease |

## [2020]

**Options:**

A. (A) (B) (C) (D)
(iii) (ii) (i) (iv)

B. (A) (B) (C) (D)
(iii) (i) (iv) (ii)

C. (A) (B) (C) (D)
(ii) (i) (iv) (iii)

D.

| (A) | (B) | (C) | (D) |
|---|---|---|---|
| (iv) | (iii) | (i) | (ii) |

**Answer: B**

## Solution:

Grave's disease is due to excess secretion of thyroid hormones ($T_3$&$T_4$). Diabetes mellitus is due to hyposecretion of insulin from beta-cells of pancreas. Diabetes insipidus is due to hyposecretion of ADH from posterior pituitary. Addison's disease is due to hyposecretion of hormone from adrenal cortex.

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# Question16

## Select the correct statement.
## [2020]

**Options:**

A. Glucagon is associated with hypoglycemia.

B. Insulin acts on pancreatic cells and adipocytes.

C. Insulin is associated with hyperglycemia.

D. Glucocorticoids stimulate gluconeogenesis.

**Answer: D**

## Solution:

**Solution:**
Glucagon is associated with hyperglycemia. Insulin acts on hepatocytes and adipocytes and is associated with hypoglycemia. Glucocorticoid stimulates gluconeogenesis, so increase blood sugar level.

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# Question17

## Artificial light, extended work-time and reduced sleep-time disrupt the activity of –
## [2019, Odisha]

**Options:**

A. Posterior pituitary gland

B. Thymus gland

C. Pineal gland

D. Adrenal gland

**Answer: C**

## Solution:

Artificial light, extended work time and reduced sleep-time disrupt the activity of pineal gland.
Melatonin hormone of pineal gland plays a very important role in the regulation of a 24-hours (diurnal) rhythm of our body.
Melatonin helps in maintaining the normal rhythms of sleep-wake cycle and body temperature.

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# Question18

## Match the following hormones with the respective disease:

| (a) Insulin | (i) Addison's disease |
|---|---|
| (b) Thyroxine | (ii) Diabetes insipidus |
| (c) Corticoids | (iii) Acromegaly |
| (d) Growth | (iv) Goitre hormone |
| | (v) Diabetes mellitus |

## Select the correct option.
## [2019]

**Options:**

A. (a) (b) (c) (d )
(v) (i) (ii) (iii)

B. (a) (b) (c) (d )
(ii) (iv) (iii) (i)

C. (a) (b) (c) (d )
(v) (iv) (i) (iii)

D. (a) (b) (c) (d )
(ii) (iv) (i) (iii)

**Answer: C**

## Solution:

Insulin is a pancreatic hormone, secreted from alpha cells of islets of Langerhans. Its deficiency leads to diabetes mellitus (characterised by high blood sugar levels over a prolonged period).
Thyroxine is an iodine containing hormone, secreted by the thyroid gland. It plays an important role in regulating the body's metabolic rate, heart and digestive function, muscle control, brain development and bone maintenance. Hyper secretion or hyposecretion of thyroxine can be associated with enlargement of thyroid gland called goitre.
Deficiency of corticoids (cortisol and aldosterone) secreted from adrenal gland (cortex region) leads to Addison's disease. Cortisol regulates the body's reaction to stressful situations. Aldosterone helps with sodium and potassium regulation. The adrenal cortex also produces sex hormones (androgens).
Acromegaly is an abnormal growth of the hands, feet, and face, caused by overproduction of growth hormone by the pituitary gland.

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# Question19

## How does steroid hormone influence the cellular activities? [2019]

**Options:**

A. Changing the permeability of the cell membrane.

B. Binding to DNA and forming a gene-hormone complex.

C. Activating cyclic AMP located on the cell membrane.

D. Using aquaporin channels as second messenger.

**Answer: B**

## Solution:

**Solution:**
Steroid hormones pass through the plasma membrane of a target cell and adhere to intracellular receptors residing in the cytoplasm or in the nucleus. In the nucleus, the hormone-receptor complex binds to a DNA sequence, called a hormone response element , which triggers gene transcription and translation.

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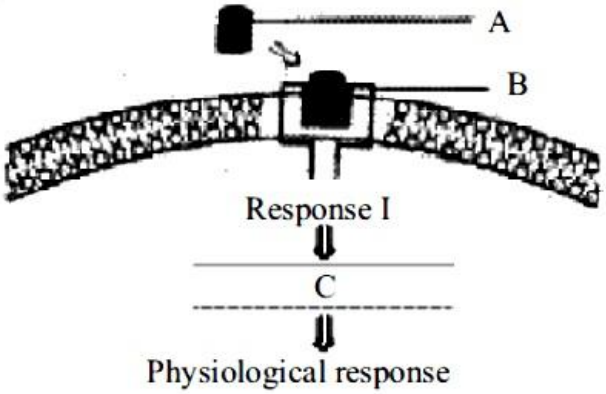
# Question20

## Identify A, B and C in the diagrammatic representation of the mechanism of hormone action.




## [2019, Odisha]

**Options:**

A. A = Protein hormone;
B = Cyclic AMP;
C = Hormone-receptor complex

B. A = Steroid hormone;
B = Hormone-receptor complex;
C = Protein

C. A = Protein hormone;
B = Receptor C = Cyclic AMP

D. A = Steroid hormone; B = Receptor;
C = Second messenger

**Answer: C**

## Solution:

The given diagrammatic representation shows the mechanism of protein hormone action.
'A' is a hormone such as FSH that cannot cross lipid bilayer therefore it interacts with the membrane-bound receptors and does not enter the target cell, but generates second messengers. Peptide, polypeptide, protein hormones and catecholamines act through this mechanism.
'B' represents the extracellular receptors present on cell surface that forms a hormonereceptor complex which brings about conformational changes in the cytoplasmic part of the receptor. This cytoplasmic part can produces second messengers such as $Ca^{+2}$, cAM P, $I P_3$ etc. which activates the existing enzyme system of the cell and accelerates the biochemical reactions in the cell.
Hence, 'C' represents the generation of second messenger.

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# Question21

## Which of the following is an amino acid derived hormone? [2018]

**Options:**

A. Epinephrine

B. Ecdysone

C. Estriol

D. Estradiol

**Answer: A**

## Solution:

Epinephrine is derived from tyrosine by the removal of carboxyl group. It is a catecholamine.

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# Question22

## GnRH, a hypothalamic hormone, needed in reproduction, acts on (NEET 2017)



**Options:**

A. anterior pituitary gland and stimulates secretion of LH  and F SH

B. posterior pituitary gland and stimulates secretion of oxytocin and F SH

C. posterior pituitary gland and stimulates secretion of LH  and relaxin

D. anterior pituitary gland and stimulates secretion of LH  and oxytocin

**Answer: A**

## Solution:

**Solution:**
(a) : Gonadotropin releasing hormone (GnRH) is secreted by the hypothalamus which stimulates the anterior lobe of pituitary gland to secrete luteinising hormone (LH) and Follicle Stimulating Hormone (FSH).

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# Question23

## Hypersecretion of growth hormone in adults does not cause further increase in height, because (NEET 2017)



**Options:**

A. epiphyseal plates close after adolescence

B. bones loose their sensitivity to growth hormone in adults

C. muscle fibres do not grow in size after birth

D. growth hormone becomes inactive in adults

**Answer: A**

## Solution:

(a) : Epiphyseal plate is a hyaline cartilage plate in the metaphysis at each end of long bone. It is part of long bone where new bone growth takes place. In adults, elevated levels of GH results in acromegaly where no increase in height occurs because of ossified epiphyseal plate.

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# Question24

## A temporary endocrine gland in the human body is (NEET 2017)



**Options:**

A. corpus cardiacum

B. corpus luteum

C. corpus allatum

D. pineal gland

**Answer: B**

## Solution:

**Solution:**
(b) : Corpus luteum is a temporary endocrine gland in human females. It secretes progesterone which stimulates the uterine glands to produce increased amount of watery mucus and is also essential for maintenance of endothelium. In absence of fertilisation, corpus luteum disintegrate leading to menstruation.

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# Question25

## Graves' disease is caused due to (NEET II 2016)



**Options:**

A. hyposecretion of thyroid gland

B. hypersecretion of thyroid gland

C. hyposecretion of adrenal gland

D. hypersecretion of adrenal gland

**Answer: B**

## Solution:

(b) : Exophthalmic goitre or Graves' disease is a thyroid enlargement (goitre) in which the thyroid secretes excessive amount of thyroid hormone. It is characterised by exophthalmia (protrusion of eye balls because of fluid accumulation behind them , loss of weight, slightly rise in the body temperature, excitability, rapid heart beat, nervousness and restlessness.

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# Question26

## Name a peptide hormone which acts mainly on hepatocytes, adipocytes and enhances cellular glucose uptake and utilisation.
## (NEET II 2016)



**Options:**

A. Insulin

B. Glucagon

C. Secretin

D. Gastrin

**Answer: A**

## Solution:

**Solution:**
Insulin is a peptide hormone secreted from beta cells of islets of Langerhans of pancreas. It acts on hepatocytes and adipocytes and increases uptake of cellular glucose and its utilisation. This causes rapid movement of glucose to hepatocytes and adipocytes from blood, thereby resulting in decreased levels of glucose in blood. It also stimulates glycogenesis i.e. conversion of glucose to glycogen in target cells.

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# Question27

## The posterior pituitary gland is not a 'true' endocrine gland because
## (NEET II 2016)



**Options:**

A. it is provided with a duct

B. it only stores and releases hormones

C. it is under the regulation of hypothalamus

D. it secretes enzymes

**Answer: B**

## Solution:

(b) : Posterior lobe of pituitary gland does not secrete any hormone. Its hormones are synthesised by the hypothalamus. It only stores and releases these hormones. Hence, it cannot be considered as true gland.

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# Question28

## Which of the following pairs of hormones are not antagonistic (having opposite effects) to each other?
## (NEET I 2016)



**Options:**

A. Aldosterone - Atrial Natriuretic Factor

B. Relaxin - Inhibin

C. Parathormone - Calcitonin

D. Insulin - Glucagon

**Answer: B**

## Solution:

**Solution:**
(b) : Relaxin hormone is secreted by ovary and placenta during pregnancy, which relaxes ligaments in pelvis and softens and widens cervix during childbirth. Inhibin secreted by granulosa cells in the ovaries inhibits secretion of FSH by anterior pituitary. Thus, relaxin and inhibin have different functions and are not antagonistic.

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# Question29

## The amino acid tryptophan is the precursor for the synthesis of
## (NEET I 2016)

**Options:**

A. estrogen and progesterone

B. cortisol and cortisone

C. melatonin and serotonin

D. thyroxine and triiodothyronine.

**Answer: C**

## Solution:

(c) : Tryptophan is an essential amino acid which is precursor for the synthesis of melatonin and serotonin.

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# Question30

## Which one of the following hormones is not involved in sugar metabolism?
## (2015)



**Options:**

A. Insulin

B. Glucagon

C. Cortisone

D. Aldosterone

**Answer: D**

## Solution:

**Solution:**
(d) : Aldosterone (salt-retaining hormone) is the principal mineralocorticoid in humans, secreted by adrenal cortex. Its main function is to regulate sodium content of the body.

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# Question31

## Which one of the following hormones though synthesised elsewhere, is stored and released by the master gland?
## (2015)



**Options:**

A. Prolactin

B. Melanocyte stimulating hormone

C. Antidiuretic hormone

D. Luteinising hormone

**Answer: C**

## Solution:

**Solution:**
(c) : Two hormones viz oxytocin (OT) and antidiuretic hormone (ADH) are synthesised in the hypothalamus, but stored and released by the posterior lobe of pituitary gland.

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# Question32

## A chemical signal that has both endocrine and neural roles is (2015 Cancelled)

**Options:**

A. epinephrine

B. cortisol

C. melatonin

D. calcitonin.

**Answer: A**

## Solution:

**Solution:**
(a) : Hormones epinephrine and norepinephrine are secreted from adrenal medulla. They are emergency hormones released in condition of stress, emergency etc. Epinephrine and norepinephrine are also released by adrenergic nerve fibres of sympathetic nervous system where they act as neurotransmitters.

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# Question33

## Identify the hormone with its correct matching of source and function. (2014)



**Options:**

A. Oxytocin - posterior pituitary, growth and maintenance of mammary glands.

B. Melatonin - pineal gland, regulates the normal rhythm of sleepwake cycle.

C. Progesterone - corpus luteum, stimulation of growth and activities of female secondary sex organs.

D. Atrial natriuretic factor - ventricular wall, increases the blood pressure.

**Answer: B**

## Solution:

**Solution:**
(b) : Oxytocin is produced by hypothalamus and generally secreted by posterior pituitary. It stimulates secretion of milk from mammary glands; causes contraction of uterus at the time of child birth.
Progesterone is secreted by corpus luteum. It stimulates uterus for pregnancy, implantation, formation of placenta and development of mammary glands.
Atrial natriuretic factor is secreted by atrial wall in response to an increased return of the venous blood. This hormone regulates the blood volume through increased excretion of ions and water.

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# Question34

## Fight-or-flight reactions cause activation of
## (2014)



**Options:**

A. the parathyroid glands, leading to increased metabolic rate

B. the kidney, leading to suppression of reninangiotensin-aldosterone pathway

C. the adrenal medulla, leading to increased secretion of epinephrine and norepinephrine

D. the pancreas leading to a reduction in the blood sugar levels.

**Answer: C**

## Solution:

**Solution:**
(c) : Hormones epinephrine and norepinephrine are secreted from adrenal medulla. They are emergency hormones released in condition of stress, emergency etc. Epinephrine and norepinephrine are also released by adrenergic nerve fibres of sympathetic nervous system where they act as neurotransmitters.

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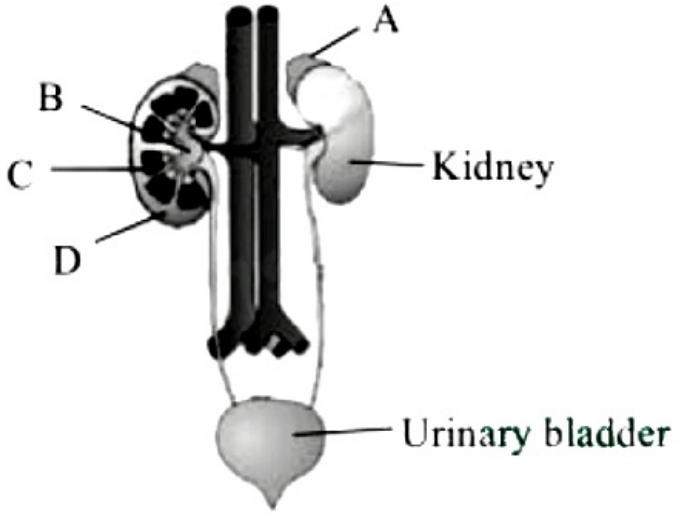
# Question35

## Figure shows human urinary system with structures labelled A to D. Select option which correctly identifies them and gives their characteristic and/ or functions.




## (2013)

**Options:**

A. C - Medulla - inner zone of kidney and contains complete nephrons.

B. D− Cortex − outer part of kidney and do not contain any part of nephrons.

C. A - Adrenal gland - located at the anterior part of kidney. Secrete catecholamines which stimulate glycogen breakdown.

D. B-Pelvis - broad funnel shaped space inner to hilum, directly connected to loops of Henle.

**Answer: C**

## Solution:

(c) : In the given figure, A is adrenal gland which secretes two catecholamines; adrenaline (epinephrine) and noradrenaline (norepinephrine). Adrenaline increases the conversion of glycogen to glucose providing quick energy for "fight or flight" response. B is renal pelvis which is a sac like cavity of the kidney leading to ureters, is not directly connected to loop of Henle. C is medulla, the inner region of kidney containing loop of Henle, collecting ducts and ducts of Bellini. D is cortex which has proximal and distal convoluted tubules and contains Malpighian corpuscles.

---

# Question36

## A pregnant female delivers a baby who suffers from stunted growth, mental retardation, low intelligence quotient and abnormal skin. This is the result of
## (2013)



**Options:**

A. cancer of the thyroid gland

B. oversecretion of pars distalis

C. deficiency of iodine in diet

D. low secretion of growth hormone.

**Answer: C**

## Solution:

**Solution:**
(c) : Iodine is needed for the synthesis of $T_3$ and $T_4$. Iodine binds to the tyrosine residues in thyroglobulin, which is then hydrolysed into iodotyrosines that combine to form triiodothyronine ($T_3$) or thyroxine (tetra-iodothyronine or $\text{left} . T_4$) Therefore, deficiency of iodine in the diet of a pregnant female will lead to improper synthesis of thyroid hormones in newly borne infant. The deficiency of thyroid hormones in infants causes 'cretinism' whose symptoms are slow heart beat, lower blood pressure, decrease in temperature, stunted growth, low intelligence quotient and abnormal skin.

---

# Question37

## Which of the following statements is correct in relation to the endocrine system?
## (2013)



**Options:**

A. Non-nutrient chemicals produced by the body in trace amounts that act as intercellular messenger are known as hormones.

B. Releasing and inhibitory hormones are produced by the pituitary gland.

C. Adenohypophysis is under direct neural regulation of the hypothalamus.

D. Organs in the body like gastrointestinal tract, heart, kidney and liver do not produce any hormones.

**Answer: A**

## Solution:

(a) : Releasing and inhibiting factors are released by hypothalamus. The hypothalamus is connected to adenohypophysis by hypophysial portal vein and is connected to the neurohypophysis by axons of neurosecretory cells. Hence, neurohypophysis is directly under the neural control. The cardiocytes of atria of the heart secrete peptide hormone, called atrial natriuretic factor (ANF) in response to an increased return of the deoxygenated (venous) blood. The liver produces angiotensinogen which is changed to angiotensin II by an enzyme renin secreted by juxtaglomerular apparatus (JGA).

---

# Question38

## Select the answer which correctly matches the endocrine gland with the hormone it secretes and its function/deficiency symptom.

| | Endocrine gland | Hormone | Function/ Deficiency symptoms |
|---|---|---|---|
| (a) | Thyroid gland | Thyroxine | Lack of iodine in diet results in goitre |
| (b) | Corpus luteum | Testosterone | Stimulates spermatogenesis |
| (c) | Anterior pituitary | Oxytocin | Stimulates uterus contraction during child birth |
| (d) | Posterior pituitary | Growth hormone | Oversecretion stimulates abnormal growth |

## (2013)

**Options:**

A. (a)

B. (b)

C. (c)

D. (d)

**Answer: A**

## Solution:

**Solution:**
(a) : Iodine is required for production of thyroxine, thus lack of iodine results in hyposecretion of thyroxine. To compensate, thyroid gland enlarges and the condition is known as goitre. Corpus luteum secretes progesterone which maintains uterine endothelium and mucus secretion in uterus, Fallopian tubes and vagina. Oxytocin stimulates uterine

contractions but is secreted by posterior pituitary. Anterior pituitary secretes GH, whose oversecretion causes abnormal growth.

---

# Question39

## Select the option which correctly matches the endocrine gland with its hormone and its function.

| | Endocrine gland | Hormone | Function/ Deficiency symptoms |
|---|---|---|---|
| (a) | Placenta | Estrogen | Initiates secretion of the milk |
| (b) | Corpus luteum | Estrogen | Essential for maintenance of endometerium |
| (c) | Leydig's cells | Androgen | Initiates the production of sperms |
| (d) | Ovary | FSH | Stimulates follicular development and the secretion of estrogens |

## (KN NEET 2013)

**Options:**

A. (a)

B. (b)

C. (c)

D. (d)

**Answer: C**

## Solution:

**Solution:**
(c) : Interstitial cells (or Leydig 's cells) are the cells interspersed between the seminiferous tubules of the testis. They secrete androgens including testosterone in response to stimulation by luteinizing hormone from the anterior pituitary gland. Androgens produce and maintain male characteristics and stimulate germinal epithelium to undergo spermatogenesis.

---

# Question40

## Norepinephrine
## (i) is released by sympathetic fibers
## (ii) is released by parasympathetic fibers
## (iii) increases the heart rate
## (iv) decreases blood pressure.
## Which of the above statements are correct?
## (2013)

**Options:**

A. (i) and (iii)

B. (ii) and (iii)

C. (ii) and (iv)

D. (i) and (iv)

(KN NEET 2013)

**Answer: A**

## Solution:

**Solution:**
(a) : Norepinephrine is secreted by some neurons of the sympathetic nervous system and also by adrenal medulla. It accelerates heart rate.

---

# Question41

## Which of the following represents the action of insulin? (KN NEET 2013)

**Options:**

A. Increases blood glucose level by stimulating glucagon production.

B. Decreases blood glucose levels by forming glycogen.

C. Increases blood glucose levels by promoting cellular uptake of glucose.

D. Increases blood glucose levels by hydrolysis of glycogen.

**Answer: B**

## Solution:

**Solution:**
(b) Insulin is a peptide hormone, which plays a major role in the regulation of glucose homeostasis. Insulin acts mainly on hepatocytes and adipocytes (cells of adipose tissue), and enhances cellular glucose uptake and utilization. Insulin also stimulates conversion of glucose to glycogen (glycogenesis) in the target cells.

---

# Question42

## A person entering an empty room suddenly finds a snake right in front on opening the door. Which one of the following is likely to happen in his neuro-hormonal control system? (2012)

**Options:**

A. Sympathetic nervous system is activated releasing epinephrine and norepinephrine from adrenal medulla.

B. Neurotransmitters diffuse rapidly across the cleft and transmit a nerve impulse.

C. Hypothalamus activates the parasympathetic division of brain.

D. Sympathetic nervous system is activated releasing epinephrine and norepinephrine from adrenal cortex

**Answer: A**

## Solution:

**Solution:**
(a) : Hormones epinephrine and norepinephrine are secreted from adrenal medulla. They are emergency hormones released in condition of stress, emergency etc. Epinephrine and norepinephrine are also released by adrenergic nerve fibres of sympathetic nervous system where they act as neurotransmitters.

---

# Question43

## Which one of the following pairs of hormones are the examples of those that can easily pass through the cell membrane of the target cell and bind to a receptor inside it (mostly in the nucleus)? (2012)



**Options:**

A. Insulin, glucagon

B. Thyroxine, insulin

C. Somatostatin, oxytocin

D. Cortisol, testosterone

**Answer: D**

## Solution:

**Solution:**
(d) : Steroid hormones such as cortisol, testosterone, estradiol and progesterone, mostly regulate gene expression or chromosome function by the interaction of hormone-receptor complex with the genome. So, these easily pass through the cell membrane of the target cell and bind to a receptor inside it.

---

# Question44

## What is correct to say about the hormone action in humans? (2012)

**Options:**

A. Glucagon is secreted by β -cells of islets of Langerhans and stimulates glycogenolysis.

B. Secretion of thymosins is stimulated with aging.

C. In females, FSH first binds with specific receptors on ovarian cell membrane.

D. FSH stimulates the secretion of estrogen and progesterone.

**Answer: C**

## Solution:

**Solution:**
(c) : Hormone action involves their reception by target cells. Specific proteins called hormone receptors that are located in target tissues only bind with these hormones. Hormone receptor may be of two types: membrane bound receptor and intracellular receptors. Steroid hormones etc., bind with intracellular receptors while some hormones e.g., pituitary hormones like FSH etc., bind with membrane bound receptors.

---

# Question45

## Match the source gland with its respective hormone and function and select the correct option.

| | Source gland | Hormone | Function/ Deficiency symptoms |
|---|---|---|---|
| (a) | Anterior pituitary | Oxytocin | Contraction of uterus muscles during child birth |
| (b) | Posterior pituitary | Vasopressin | Stimulates reabsorption of water in the distal tubules in the nephron |
| (c) | Corpus luteum | Estrogen | Supports pregnancy |
| (d) | Thyroid | Thyroxine | Regulates blood calcium level |

## (2011)

**Options:**

A. (a)

B. (b)

C. (c)

D. (d)

**Answer: B**

## Solution:

**Solution:**
(b) : Posterior lobe of pituitary stores and releases two hormones, called oxytocin and vasopressin. These hormones are actually produced by the neuro secretary cells in the hypothalamus and stand in the terminals of their axons that pass into the posterior lobe through a stalk. They are released via posterior lobe when required. Vasopressin is also called antidiuretic hormone ADH. It decreases the loss of water in the urine by increasing reabsorption of water in the distal convoluted tubules, collecting tubules and collecting ducts in the kidneys.

# Question46

**Given below is an incomplete table on hormones, their source glands and one major effect of each human body. Identify the option representing correct grouping of hormone its gland and effect.**

| Gland | Secretion | Effect on body |
|---|---|---|
| A | Estrogen | Maintenance of secondary sexual characters |
| Alpha cells of Islets of Langerhans | B | Raises blood sugar level |
| Anterior pituitary | C | Over secretion leads to gigantism |

| | A | B | C |
|---|---|---|---|
| (a) | Ovary | Glucagon | Growth hormone |
| (b) | Placenta | Insulin | Vasopressin |
| (c) | Ovary | Insulin | Calcitonin |
| (d) | Placenta | Glucagon | Calcitonin |

**(2011)**

**Options:**

A. (a)

B. (b)

C. (c)

D. (d)

**Answer: A**

## Solution:

(a) : The correct option for the three blanks A, B and C are ovary, glucagon and growth hormone respectively.

---

# Question47

## The 24 hour (diurnal) rhythm of our body such as the sleep-wake cycle is regulated by the hormone
## (2011)



**Options:**

A. calcitonin

B. prolactin

C. adrenaline

D. melatonin.

**Answer: D**

## Solution:

**Solution:**
(d) : Melatonin is a hormone secreted by the pineal gland and retinas of vertebrates. Melatonin secretion by the pineal gland is linked to the dark light cycle of the organism's environment, being greatest at night and lowest by day. The hormone is involved in regulating certain diurnal and seasonal changes in the body, such as the reproductive cycle in seasonally breeding animals. It is used as a drug to treat sleep disorders and symptoms of jet lag.

---

# Question48

## Injury to adrenal cortex is not likely to affect the secretion of which one of the following?
## (2010)



**Options:**

A. Aldosterone

B. Both androstenedione and dehydroepiandrosterone

C. Adrenaline

D. Cortisol

**Answer: C**

## Solution:

**Solution:**
(c) : Adrenal glands or (suprarenal glands) are two triangular endocrine glands, each of which covers the superior surface of a kidney. Each gland has two parts, the medulla and cortex. The medulla forms the grey core of the gland; it consists mainly of chromaffin tissue and is stimulated by the sympathetic nervous system to produce adrenaline and noradrenaline. The cortex is a yellowish tissue surrounding the medulla. It is stimulated by pituitary hormones (principally ACTH) to produce three kinds of corticosteroid hormones, which affect carbohydrate metabolism (e.g., cortisol),

electrolyte metabolism ( e.g., aldosterone), and the sex glands (oestrogens and androgens). Thus injury to adrenal cortex is not likely to affect the secretion of adrenaline.

---

# Question49

## Low $Ca^{++}$ in the body fluid may be the cause of (2010)



**Options:**

A. tetany

B. anaemia

C. angina pectoris

D. gout.

**Answer: A**

## Solution:

**Solution:**
(a) : Tetany is a spasm and twitching of the muscles, particularly those of the face, hands, and feet. Tetany is usually caused by a reduction in the blood calcium level, which may be due to under active parathyroid glands, rickets, or alkalosis.

---

# Question50

## Which one of the following pairs is incorrectly matched? (2010)



**Options:**

A. Glucagon - Beta cells (source)

B. Somatostatin - Delta cells (source)

C. Corpus luteum - Relaxin (secretion)

D. Insulin - Diabetes mellitus (disease)

**Answer: A**

## Solution:

**Solution:**
(a) : Glucagon is a hormone, secreted by the cells of the islets of Langerhans in the pancreas, that increases the concentration of glucose in the blood by stimulating the metabolic breakdown of glycogen. It thus antagonizes the effects of insulin.

# Question51

## Toxic agents present in food which interfere with thyroxine synthesis lead to the development of
## (2010)



**Options:**

A. toxic goitre

B. cretinism

C. simple goitre

D. thyrotoxicosis.

**Answer: C**

## Solution:

**Solution:**
(c) : Iodine is required for production of thyroxine, thus lack of iodine results in hypo secretion of thyroxine. To compensate, thyroid gland enlarges and the condition is known as goitre. Corpus luteum secretes progesterone which maintains uterine endothelium and mucus secretion in uterus, Fallopian tubes and vagina. Oxytocin stimulates uterine contractions but is secreted by posterior pituitary. Anterior pituitary secretes GH, whose over secretion causes abnormal growth.

---

# Question52

## Select the correct matching of a hormone, its source and function.

| | Hormone | Source | Function |
|---|---|---|---|
| (a) | Vasopressin | Posterior pituitary | Increases loss of water through urine |
| (b) | Norepinephrine | Adrenal medulla | Increases heart beat, rate of respiration and alertness |
| (c) | Glucagon | Beta-cells of Islets of Langerhans | Stimulates glycogenolysis |
| (d) | Prolactin | Posterior pituitary | Regulates growth of mammary glands and milk formation in females |

## (2010)

**Options:**

A. (a)

B. (b)

C. (c)

D. (d)

**Answer: B**

## Solution:

**Solution:**
Norepinephrine is released from the adrenal medulla into the blood as a hormone and is also a neurotransmitter in the central nervous system and sympathetic nervous system. An increase in norepinephrine from the sympathetic nervous system increases the rate of contractions in the heart. Norepinephrine also underlies the fight-or-flight response, along with epinephrine, directly increasing heart rate, triggering the release of glucose from energy stores, and increasing blood flow to skeletal muscle.
Prolactin is a hormone produced by the anterior portion of the pituitary gland.
Vasopressin's two primary functions are to retain water in the body and to constrict blood vessels. It regulates the body's retention of water by acting to increase water reabsorption in the collecting ducts of the nephron.
Glucagon is a peptide hormone, produced by alpha cells of the pancreas, that raises the concentration of glucose in the bloodstream.

---

# Question53

## A health disorder that results from the deficiency of thyroxine in adults and characterised by (i) a low metabolic rate, (ii) increase in body weight and (iii) tendency to retain water in tissues is (2009)



**Options:**

A. simple goitre

B. myxoedema

C. cretinism

D. hypothyroidism.

**Answer: B**

## Solution:

**Solution:**
(b) : Myxoedema is caused by deficiency of thyroid hormone or thyroxine in adults. It is characterized by low metabolic rate, body gain, puffy appearance, low body temperature etc. This disease can be treated by administration of thyroid hormones.

---

# Question54

## Which one of the following pair of organs includes only the endocrine glands? (2008)

**Options:**

A. Thymus and testes

B. Adrenal and ovary

C. Parathyroid and adrenal

D. Pancreas and parathyroid

**Answer: C**

## Solution:

**Solution:**
(c) : Parathyroid and adrenal glands are the endocrine glands because they manufacture hormones and secretes them directly into the blood stream to act at distant sites in the body. Thyroid and pituitary are its other examples.

---

# Question55

## The blood calcium level is lowered by the deficiency of (2008)

**Options:**

A. both calcitonin and parathormone

B. calcitonin

C. parathormone

D. thyroxine.

**Answer: C**

## Solution:

**Solution:**
(c) : Parathormone is secreted by chief cells of the parathyroid that regulates the metabolism of calcium and phosphate. It increases calcium absorption from the intestine and also increases calcium resorption from the nephrons of the kidneys. So its deficiency leads to low blood calcium level.

---

# Question56

## Feeling the tremors of an earthquake a scared resident of seventh floor of a multistoryed building starts climbing down the stairs rapidly. Which hormone initiated this action? (2007)

**Options:**

A. Adrenaline

B. Glucagon

C. Gastrin

D. Thyroxine

**Answer: A**

## Solution:

**Solution:**
(a) : Adrenaline (epinephrine), also called emergency hormone, is a hormone, produced by the medulla of the adrenal glands, that increases heart activity, improves the power and prolongs the action of muscles, and increases the rate and depth of breathing to prepare the body for 'fright, flight, or fight'. At the same time it inhibits digestion and excretion. Similar effects are produced by stimulation of the sympathetic nervous system.

---

# Question57

## A person is having problems with calcium and phosphorus metabolism in his body. Which one of the following glands may not be functioning properly?
## (2007)



**Options:**

A. Parotid

B. Pancreas

C. Thyroid

D. Parathyroid

**Answer: D**

## Solution:

**Solution:**
(d) : Parathormone is secreted by chief cells of the parathyroid that regulates the metabolism of calcium and phosphate. It increases calcium absorption from the intestine and also increases calcium resorption from the nephrons of the kidneys. So its deficiency leads to low blood calcium level.

---

# Question58

## Which hormone causes dilation of blood vessels, increased oxygen consumption and glucogenesis?
## (2006)

**Options:**

A. Glucagon

B. ACTH

C. Insulin

D. Adrenaline

**Answer: D**

## Solution:

**Solution:**
(d) : Adrenaline is the hormone secreted by adrenal medulla. It prepares the animal to face special conditions created by physical stress. All these conditions require more energy which is provided by increasing heart beat, blood pressure, respiratory rate, sugar level of blood, blood supply of heart and skeletal muscles and brain through dilation of their small arteries, and oxidative metabolism. It also stimulates the breakdown of liver and muscle glycogen (glucogenesis) to provide glucose for respiration.

---

# Question59

## Which of the following is an accumulation and release centre of neurohormones?
## (2006)

**Options:**

A. Anterior pituitary lobe

B. Posterior pituitary lobe

C. Intermediate lobe of the pituitary

D. Hypothalamus

**Answer: B**

## Solution:

The posterior Pituitary or neurohypophysis is a structure under direct regulation of hypothalamus. The nuclei of hypothalamus accumulate Vasopressin and Oxytocin in this neurohypophysis which serves as release centre of these neurohormones.
So, the correct answer is 'Posterior Pituitary lobe'.

---

# Question60

## A steroid hormone which regulates glucose metabolism is

## (2006)

**Options:**

A. cortisone

B. cortisol

C. corticosterone

D. 11 -deoxycorticosterone.

**Answer: B**

## Solution:

**Solution:**
(b) : Adrenal glands or (suprarenal glands) are two triangular endocrine glands, each of which covers the superior surface of a kidney. Each gland has two parts, the medulla and cortex. The medulla forms the grey core of the gland; it consists mainly of chromaffin tissue and is stimulated by the sympathetic nervous system to produce adrenaline and noradrenaline. The cortex is a yellowish tissue surrounding the medulla. It is stimulated by pituitary hormones (principally ACTH) to produce three kinds of corticosteroid hormones, which affect carbohydrate metabolism (e.g., cortisol), electrolyte metabolism ( e.g., aldosterone), and the sex glands (oestrogens and androgens). Thus injury to adrenal cortex is not likely to affect the secretion of adrenaline.

---

# Question61

## Which one of the following is not a secondary messenger in hormone action?
## (2006)

**Options:**

A. cAMP

B. cGMP

C. Calcium

D. Sodium

**Answer: D**

## Solution:

**Solution:**
(d) : Secondary messengers are low-weight diffusible molecules that are used to relay signals within a cell. They are synthesized or released by specific enzymatic reactions, usually as a result of an external signal that is received by a transmembrane receptor. cAMP, cGMP and $Ca^{2+}$ act as secondary messengers and are located within the cytoplasm. Sodium is an essential nutrient which helps to maintain blood volume and keeps nerves functioning.

---

# Question62

## Which one of the following statements is correct? (2006)



**Options:**

A. Endocrine glands regulate neural activity, but not vice versa.

B. Neurons regulate endocrine activity, but not vice versa.

C. Endocrine glands regulate neural activity, and nervous system regulates endocrine glands.

D. Neither hormones control neural activity nor the neurons control endocrine activity.

**Answer: C**

## Solution:

**Solution:**
(c) : The endocrine system links the brain to the organs that control body metabolism, growth and development, and reproduction. The endocrine system is regulated by feedback. For example, the hormones that are regulated by the pituitary gland, a signal is sent from the hypothalamus to the pituitary gland in the form of a "releasing hormone," which stimulates the pituitary to secrete a "stimulating hormone" into the circulation. The stimulating hormone then signals the target gland to secrete its hormone. As the level of this hormone rises in the circulation, the hypothalamus and the pituitary gland shut down secretion of the releasing hormone and the stimulating hormone, which in turn slows the secretion by the target gland. This system results in stable blood concentrations of the hormones that are regulated by the pituitary gland.

---

# Question63

## Which one of the following hormones is modified amino acid? (2004)



**Options:**

A. Epinephrine

B. Progesterone

C. Prostaglandin

D. Estrogen

**Answer: A**

## Solution:

**Solution:**
(a) Epinephrine is synthesized from amino acid tyrosine. While estrogen and progesterone are modified steroids and prostaglandins are basically fat.

---

# Question64

## Which one of the following pairs correctly matches a hormone with a disease resulting from its deficiency?
## (2004)



**Options:**

A. Luteinizing hormone - Failure of ovulation

B. Insulin - Diabetes insipidus

C. Thyroxine - Tetany

D. Parathyroid hormone - Diabetes mellitus

**Answer: A**

## Solution:

**Solution:**
(a) : Ovulation occurs under the influence of luteinizing hormone and FSH (follicle stimulating hormone) of anterior pituitary gland. Thus, deficiency of luteinizing hormone results in failure of ovulation.

---

# Question65

## Chemically hormones are
## (2004)



**Options:**

A. biogenic amines only

B. proteins, steroids and biogenic amines

C. proteins only

D. steroids only.

**Answer: B**

## Solution:

**Solution:**
(b) : Hormones are chemical messengers produced by the ductless glands (sometimes by neurons) and transported in the circulation to target cells. They regulate metabolic processes. Chemically hormones are of different nature like biogenic amines (like thyroxine, adrenaline etc), proteinaceous or polypeptide (like hypothalamic hormones etc.) and steroids (like sex hormones and adrenocorticoids).

---

# Question66

## Which one of the following pairs correctly matches a hormone with a disease resulting from its deficiency?
## (2003)



**Options:**

A. Relaxin - Gigantism

B. Prolactin - Cretinism

C. Parathyroid hormone - Tetany

D. Insulin - Diabetes insipidus

**Answer: C**

## Solution:

**Solution:**
(c) : Tetany is a spasm and twitching of the muscles, particularly those of the face, hands, and feet. Tetany is usually caused by a reduction in the blood calcium level, which may be due to under active parathyroid glands, rickets, or alkalosis.

---

# Question67

## Acromegaly is caused by
## (2002)



**Options:**

A. excess of STH

B. excess of thyroxine

C. deficiency of thyroxine

D. excess of adrenaline.

**Answer: A**

## Solution:

**Solution:**
(a) : Acromegaly is caused by excess of STH (somatotropic hormone),also called growth hormone released by anterior lobe of pituitary after adolescence. The bones of the lower jaw and limbs become abnormally enlarge but the body does not attain a giant stature. Excess of thyroxine causes cretinism and myxoedema. Excess of adrenaline causes increased BMR, heart beat, excitement etc.

---

# Question68

## Adrenaline directly affects on
## (2002)



**Options:**

A. S.A. node

B. β -cells of Langerhans

C. dorsal root of spinal nerve

D. epithelial cells of stomach.

**Answer: A**

## Solution:

**Solution:**
(a) : Adrenaline directly affects the SA node to increase rate of heartbeat. Adrenaline prepares the body for emergency reactions like fight and flight. Thus there is increase in heart rate, breathing rate, blood pressure, glucose level in blood, peripheral circulation, etc.

---

# Question69

## When both ovaries are removed from rat then which hormone is decreased in blood?
## (2002)



**Options:**

A. Oxytocin

B. Prolactin

C. Estrogen

D. Gonadotropin releasing factor

**Answer: C**

## Solution:

**Solution:**
(c) : Ovary secretes two hormones. Oestrogen before ovulation and progesterone after ovulation. Oxytocin, prolaction are pituitary hormones and gonadotropin releasing factor is secreted by hypothlalamus of brain to stimulate pituitary for the secretion of gonadotropic hormones.

---

# Question70

## Mainly which type of hormones control the menstrual cycle in human beings?
## (2002)

**Options:**

A. F SH

B. LH

C. F SH , LH , estrogen

D. progesterone

**Answer: C**

## Solution:

(c) : Menstrual cycle is controlled by several endocrinal parameters. In beginning of the cycle FSH (follicle stimulating hormone) of pituitary initiates development of an ovarian follicle. A growing ovarian follicle gradually secretes increasing amount of estrogen. This in turn leads to sudden surge of LH secretion by the pituitary. As the LH (leutinising hormone) level in blood suddenly increases there is ovulation. Thus only FSH or LH cannot control all the events of menstrual cycle. Progesteron is released by a corpus luteum after ovulation which actually prepares the uterus for a possible pregnancy. If there is no fertilisation progesteron level falls and there is beginning of a new cycle.

---

# Question71

## Which set is similar?
## (2001)

**Options:**

A. Corpus luteum - Graafian follicles

B. Sebum - Sweat

C. Bundle of His - Pace maker

D. Vitamin $B_7$ - Niacin

**Answer: A**

## Solution:

**Solution:**
(a) : After ovulation many of the follicular cells remain in the collapsed Graafian follicle on the surface of the ovary. The antrum (cavity) of the collapsed follicle fills with a partially clotted fluid. The follicular cells enlarge and fill with a yellow pigment, lutein. Such a follicle is called a corpus luteum.

# Question72

## Melatonin is secreted by (2000)



**Options:**

A. pineal body

B. skin

C. pituitary gland

D. thyroid

**Answer: A**

## Solution:

**Solution:**
(a): Melatonin is a hormone secreted by the pineal gland and retinas of vertebrates. Melatonin secretion by the pineal gland is linked to the dark light cycle of the organism's environment, being greatest at night and lowest by day. The hormone is involved in regulating certain diurnal and seasonal changes in the body, such as the reproductive cycle in seasonally breeding animals. It is used as a drug to treat sleep disorders and symptoms of jet lag.

---

# Question73

## Which gland secretes odorous secretion in mammals? (2000)



**Options:**

A. Bartholins

B. Prostate

C. Anal gland

D. Liver

**Answer: C**

## Solution:

**Solution:**
(c) : The anal glands are small paired sacs located on either side of the anus between the external and internal sphincter muscles. These sebaceous glands within the lining secrete a foul smelling liquid that is used for identification of members within a species. These glands are found in all carnivora except bears.

---

# Question74

## MSH is secreted by (2000)



**Options:**

A. anterior lobe of pituitary

B. middle-lobe of pituitary

C. posterior lobe of pituitary

D. endostyle.

**Answer: B**

## Solution:

**Solution:**
(b) : Middle lobe of pituitary secretes a hormone named melanocyte-stimulating hormone. It stimulates the synthesis of black pigment melanin in the skin, and also causes dispersal of melanin granules in the pigment cells, thereby darkening the colour in certain animals (fishes amphibians). In man it has no such role. Anterior lobe of pituitary secretes FSH, LH, TSH, ACTH and STH. Posterior lobe of pituitary secretes oxytocin and vasopressin.

---

# Question75

## Cholecystokinin and duocrinin are secreted by (1999)



**Options:**

A. adrenal cortex

B. thyroid gland

C. intestine

D. pancreas

**Answer: C**

## Solution:

**Solution:**
(c) : Cholecystokinin and duocrinin are secreted by intestine. It stimulates pancreas to release enzymes in pancreatic juice and stimulates gall bladder to release bile. Duocrinin causes release of viscous mucus from Brunner's glands into intestinal juice.

---

# Question76

## The function of oxytocin is to help in (1999)



**Options:**

A. child birth

B. gametogenesis

C. growth

D. lactation

**Answer: A**

## Solution:

**Solution:**
Oxytocin is produced by hypothalamus and generally secreted by posterior pituitary. It stimulates secretion of milk from mammary glands; causes contraction of uterus at the time of child birth.
Progesterone is secreted by corpus luteum. It stimulates uterus for pregnancy, implantation, formation of placenta and development of mammary glands.
Atrial natriuretic factor is secreted by atrial wall in response to an increased return of the venous blood. This hormone regulates the blood volume through increased excretion of ions and water.

---

# Question77

## Secretion of progesterone by corpus luteum is initiated by (1999)



**Options:**

A. testosterone

B. thyroxine

C. MSH

D. LH

**Answer: D**

## Solution:

**Solution:**
(d) : Luteinsing Hormone (LH) in the male, induces the interstitial cells of the testes to produce male sex hormones named androgens such as testosterone. In the female, the luteinising hormone causes ovulation, secretion of fernale sex hormone, estrogen from the maturing ovarian follicle, and progesterone by the corpus luteum.

---

# Question78

## The gonadotrophic hormones are secreted by (1999)



**Options:**

A. anterior lobe of pituitary

B. interstitial cells of testes

C. adrenal cortex

D. posterior part of thyroid.

**Answer: A**

## Solution:

**Solution:**
(a) : Gonadotrophic hormones are secreted by anterior lobe of pituitary gland. They are as follows:
(i) Follicle-stimulating hormone (FSH): It stimulates growth of ovarian follicles and their secretion of estrogens in the female, and spermatogenesis (formation of sperms) in the male.
(ii) Interstitial cell stimulating hormone (ICSH): It activates the Leydig's (interstitial) cells of the testis to secrete androgens. In female, it stimulates the corpus luteum of the ovary to secrete progesterone. In female it is termed luteinizing hormone (LH).

---

# Question79

## Diabetes is due to (1999)



**Options:**

A. enzyme deficiency

B. iodine deficiency

C. $Na^{+}$ deficiency

D. hormonal deficiency.

**Answer: D**

## Solution:

**Solution:**
Insulin is made in the pancreas. Beta cells within the islets make insulin and release it into the blood. With the help of the hormone insulin, cells throughout the body absorb glucose and use it for energy. Diabetes develops when the body doesn't make enough insulin or is not able to use insulin effectively.In an absence of anti-diuretic hormone (ADH), diabetes insipidus occurs.

---

# Question80

## Calcitonin is a thyroid hormone which (1998)



**Options:**

A. elevates calcium level in blood

B. has no effect on calcium

C. elevates potassium level in blood

D. lowers calcium level in blood.

**Answer: D**

## Solution:

**Solution:**
(d) : Calcitonin is secreted by the C cells. It regulates the concentration of calcium and phosphorus in the blood. It is under the feedback control of plasma calcium concentration, and is secreted when concentration of calcium rises in the blood. It then lowers the concentration of calcium and phosphorus in the plasma by decreasing their release from the bones.

---

# Question81

## The hormone that stimulates the stomach to secrete gastric juice is (1998)



**Options:**

A. enterokinase

B. enterogastrone

C. gastrin

D. renin.

**Answer: C**

## Solution:

**Solution:**
(c) : Gastrin hormone is secreted by mucosa of stomach and it stimulates secretion of gastric juice. Enterogastrone is secreted by duodenal epithelium. Enterokinase is an enzyme that converts trypsinogen into trypsin. Renin is secreted by kidneys. It acts on angiotensinogen to form angiotensin-II.

---

# Question82

## The contraction of gall bladder is due to

## (1998)



**Options:**

A. cholecystokinin

B. enterogastrone

C. gastrin

D. secretin

**Answer: A**

## Solution:

**Solution:**
Gallbladder contractions are induced by the action of cholecystokinin (CCK), a peptide hormone released by the neuroendocrine cells of the small intestine.
The enteroendocrine cells secrete gastrin, which in turn promotes stomach churning and induces more release of gastric juices.
Secretin and cholecystokinin are secreted by endocrine cells of the duodenal wall in response to presence of hydrochloric acid in chyme and that of fatty food respectively.
Secretin induces the release of pancreatic juice from pancreas, while cholecystokinin induces contraction of gall bladder to release stored bile.
Enterogastrone refers to any hormone secreted by duodenum in response to presence of fatty food.

---

# Question83

## The hormone which regulates the basal metabolism in our body is secreted from
## (1998)



**Options:**

A. adrenal cortex

B. pancreas

C. pituitary

D. thyroid.

**Answer: D**

## Solution:

(d) : The basal metabolism is the minimum amount of energy the body uses in order to maintain vital processes of the body. Generally, this expenditure of energy is expressed in terms of heat production per unit of body surface per day on the basal metabolic rate (BMR). Thyroid is the largest endocrine gland secreting three hormones thyroxine, triiodothyronine and calcitonin. Thyroxine and triiodothyronine control BMR of the body by regulating the rate of oxidation and production of energy.

# Question84

## Hormones thyroxine, adrenaline and the pigment melanin are formed from
## (1997)

**Options:**

A. tyrosine

B. proline

C. tryptophan

D. glycine

**Answer: A**

## Solution:

**Solution:**
(a) : Hormones thyroxine, adrenaline and the pigment melanin are formed from tyrosine. Tyrosine is transformed into dopa through the enzyme tyrosinase. Then through different metabolic pathways it produces thyroxine, adrenaline, melanin etc.

---

# Question85

## Which hormone stimulates the secretion of milk from female?
## (1996)



**Options:**

A. Oxytocin

B. Progesterone

C. LH

D. Prolactin

**Answer: D**

## Solution:

**Solution:**
(d) : Prolactin hormone stimulates the growth of milk glands during pregnancy and the secretion of milk after delivery. Oxytocin causes release of milk during sucking by the infant. LH causes ovulation and secretion of estrogen and progesterone from ovarian follicle and corpus luteum respectively. Oxytocin, LH and prolactin are released by anterior lobe of pituitary gland. Progesterone is secreted by corpus luteum.

# Question86

## Which one of the following endocrine glands stores its secretion in the extracellular space before discharging it into the blood? (1995)



**Options:**

A. Testis

B. Thyroid

C. Pancreas

D. Adrenal

**Answer: B**

## Solution:

**Solution:**
(b) : The thyroid gland is the only endocrine gland, that stores its secretory product in large quantity, normally about 10 days supplies in the extracellular space before discharging into the blood. It secretes iodinated hormone i.e., thyroxine and triiodothyronine that stored in the colloid which fills the follicle cells and released to blood when needed.

---

# Question87

## According to the accepted concept of hormone action, if receptor molecules are removed from target organs, then the target organ will (1995)



**Options:**

A. continue to respond to the hormone without any difference

B. not respond to the hormone

C. continue to respond to the hormone but will require higher concentration

D. continue to respond to the hormone but in the opposite way

**Answer: B**

## Solution:

(b) : The molecules of hormones that are amino acid derivatives, peptides or proteins are large and insoluble in lipids, and cannot enter the target cell. Therefore, they act at the cell surface. They bind to specific receptor molecules located on the surface of the cell membrane. Therefore, if receptor molecules are removed from target organs, then the target organ will not respond to the hormone.

# Question88

## The immediate cause of induction of ovulation in human female is the large plasma surge of
## (1994)



**Options:**

A. LH

B. F SH

C. progesterone

D. estradiol

**Answer: A**

## Solution:

**Solution:**
(a) : Prolactin hormone stimulates the growth of milk glands during pregnancy and the secretion of milk after delivery. Oxytocin causes release of milk during sucking by the infant. LH causes ovulation and secretion of estrogen and progesterone from ovarian follicle and corpus luteum respectively. Oxytocin, LH and prolactin are released by anterior lobe of pituitary gland. Progesterone is secreted by corpus luteum.

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# Question89

## Testosterone is produced by
## (1994)



**Options:**

A. sertoli cells

B. Leydig's cells

C. oxyntic cells

D. pituitary gland

**Answer: B**

## Solution:

(b) : Interstitial cells (or Leydig 's cells) are the cells interspersed between the seminiferous tubules of the testis. They secrete androgens including testosterone in response to stimulation by luteinizing hormone from the anterior pitutary gland. Androgens produce and maintain male characteristics and stimulate germinal epithelium to undergo spermatogenesis.

# Question90

## Gastric secretion is stopped by hormone (1993)



**Options:**

A. enterogastrone

B. gastrin

C. pancreozymin

D. cholecystokinin

**Answer: A**

## Solution:

**Solution:**
(a) : Enterogastrone is secreted by duodenal epithelium and it slows gastric contractions to delay its emptying and also stops secretion of gastric juice. Gastrin stimulates secretion of gastric juice. Cholecystokinin stimulates release of enzymes in pancreatic juice and release of bile from gall bladder. Cholecystokinin is also known as pancreozymin.

---

# Question91

## ADH or vasopressin is (1991)



**Options:**

A. enzyme that hydrolyses peptides

B. hormone secreted by pituitary that promotes reabsorption of water from glomerular filtrate

C. hormone that promotes glycogenolysis

D. energy rich compound connected with muscle contraction.

**Answer: B**

## Solution:

(b) : Posterior lobe of pituitary stores and releases two hormones, called oxytocin and vasopressin. These hormones are actually produced by the neurosecretary cells in the hypothalamus and stand in the terminals of their axons that pass into the posterior lobe through a stalk. They are released via posterior lobe when required. Vasopressin is also called antidiuretic hormone ADH. It decreases the loss of water in the urine by increasing reabsorption of water in the distal convoluted tubules, collecting tubules and collecting ducts in the kidneys.

# Question92

## Occurrence of Leydig's cells and their secretion is (1991)



**Options:**

A. ovary and estrogen

B. liver and cholesterol

C. pancreas and glucagon

D. testis and testosterone

**Answer: D**

## Solution:

**Solution:**
(d) : Interstitial cells (or Leydig 's cells) are the cells interspersed between the seminiferous tubules of the testis. They secrete androgens including testosterone in response to stimulation by luteinizing hormone from the anterior pitutary gland. Androgens produce and maintain male characteristics and stimulate germinal epithelium to undergo spermatogenesis.

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# Question93

## Insulin is a (1990)



**Options:**

A. vitamin

B. lipid

C. hormone

D. enzyme

**Answer: C**

## Solution:

(c) : Insulin is a hormone secreted by the b-cells of pancreas and it controls the sugar level in blood.

---

# Question94

## Addition of a trace of thyroxine or iodine in water containing tadpoles will
## (1990)

**Options:**

A. keep them in larval stage

B. hasten their metamorphosis

C. slow down their metamorphosis

D. kill the tadpoles

**Answer: B**

## Solution:

(b) : In 1912, Gudernatsch discovered that metamorphosis in frog's tadpole is increased by the thyroxine hormone which has the iodine as the main constituent. If thyroxine or iodine in added in water having tadpoles in it, then it increases the rate of metamorphosis in tadpole.

---

# Question95

## Which hormone possesses anti-insulin effect?
## (1988)



**Options:**

A. Cortisol

B. Calcitonin

C. Oxytocin

D. Aldosterone

**Answer: A**

## Solution:

(a) : Insulin decreases the level of glucose in the blood while cortisol (secreted by middle region of adrenal cortex) increases the blood-glucose level by converting proteins and fats into carbohydrates which are, in turn, converted to glucose.

---

# Question96

## MSH of pars intermedia of middle pituitary is responsible for
## (1988)

**Options:**

A. darkening of skin in lower vertebrates

B. light colouration of skin in lower vertebrates

C. both A and B

D. darkening of skin in human beings

**Answer: A**

## Solution:

(a) : Pars intermedia is the boundary between the anterior and posterior lobes of the pituitary. It contains three types of cells - basophils, chromophobes and colloid-filled cysts. This area produces melanocyte stimulating hormone or MSH. It stimulates the synthesis of black pigment melanin in the skin and also causes dispersion of melanin granules in the pigment cells, thereby darkening the colour in certain animals (fishes; amphibians). In man it has no such role.

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