Chemical Coordination and Integration

Chapter 22

FACT/DEFINITION TYPE QUESTIONS

1. Anterior lobe of pituitary secretes
(a) ACTH, TSH and oxytocin
(b) STH, GH and ADH
(c) TSH, ADH and prolactin
(d) FSH, GH and LH

2. A gorilla like appearance with huge hands and legs is due to abnormal secretion of
(a) FSH (b) LH
(c) LTH (d) GH

3. ACTH is secreted by
(a) adrenal cortex (b) pituitary
(c) adrenal medulla (d) thyroid

4. Which of the following hormone is required for the maintenance of corpus luteum ?
(a) Progesterone (b) Estrogen
(c) FSH (d) LH

5. Oxytocin hormone is produced by
(a) pituitary (b) adrenals
(c) hypothalamus (d) thyroid

6. Ovulation in humans is controlled by
(a) FSH and LTH (b) FSH and G.H
(c) LTH and LH (d) FSH and LH

7. Ovulation and formation of corpus luteum is controlled by
(a) ICSH
(b) FSH
(c) thyroxine hormone
(d) luteinizing hormone

8. MSH is secreted by
(a) pars intermedia (b) pars tuberalis
(c) pars distalis (d) pars nervosa

9. Secretion of estrogen is controlled by
(a) hCG (b) FSH
(c) progesterone (d) testosterone

10. Deficiency of vasopressin primarily results in
(a) increased volume of urine.
(b) decreased volume of urine.
(c) excessive secretion of urochrome.
(d) change in pH from acidic to alkaline range.

11. Anti-ageing hormone is
(a) thyroxine (b) melatonin
(c) estrogen (d) testosterone

12. Sleep-wake cycle and menstrual cycle are maintained by
(a) progesterone (b) melatonin
(c) oxytocin (d) MSH

13. When amount of ADH decreases in blood, micturition
(a) increases
(b) decreases
(c) remains unaffected
(d) increases and then decreases

14. Which hormone helps in reabsorption of water from kidney?
(a) ADH (b) STH
(c) ACTH (d) TTH

15. Which of the following occurs due to ADH deficiency?
(a) Increase urine output.
(b) Increased water in urine.
(c) Less urine.
(d) No urination.

16. Which of the following hormone acts upon the renal tubule and blood capillaries ?
(a) Glucagon (b) Aldosterone
(c) Vasopressin (d) Glucocorticoids

17. Which endocrine gland stores its secretion in extracellular spaces before discharging it into blood?
(a) Testis (b) Pancreas
(c) Thyroid (d) Adrenal

18. Which of the following hormone opposes parathormone ?
(a) ADH (b) STH
(c) Thyroxine (d) Thyrocalcitonin

19. Abnormal secretion of thyroxine produces
(a) acromegaly (b) Addison's disease
(c) cretinism (d) goitre

20. Thyroxine acts on every organ of the body, except
(a) adult brain (b) testis
(c) thyroid itself (d) bones

21. Which of the following is (are) not influenced by parathyroid hormone ?
(a) Kidney (b) Bone
(c) Small intestine (d) None of the above

22. Which of the following gland is often referred in connection with AIDS?
(a) Thymus (b) Thyroid
(c) Adrenal (d) Pancreas

23. Thymus in mammals is mainly concerned with
(a) regulation of body growth.
(b) secretion of thyrotropin.
(c) regulation of body temperature.
(d) immunological functions.

24. Which one of the following disease is caused by the under secretion of cortisol hormone?
(a) Anaemia (b) Addison's disease
(c) Hyperglycemia (d) Mental retardation

25. Which hormone possesses anti-insulin effect?
(a) Cortisol (b) Calcitonin
(c) Oxytocin (d) Aldosterone

26. Triple 'F' gland for flight, fright and fight is
(a) thyroid (b) thymus
(c) pituitary (d) adrenal

27. Glycogenesis is the result of the hormone secreted from
(a) alpha cells of pancreas.
(b) beta cells of pancreas.
(c) thyroid gland.
(d) adrenal gland.

28. Diabetes insipidus is caused by hyposecretion of
(a) insulin (b) vasopressin
(c) oxytocin (d) thymosin

29. Blood glucose level in man is regulated by
(a) insulin only
(b) adrenaline
(c) glucagon and insulin
(d) all of the above

30. Source of somatostatin is the same as that of
(a) insulin and glucagon
(b) vasopressin and oxytocin
(c) thyroxine and calcitonin
(d) somatotropin and prolactin

31. In human, testosterone is produced by
(a) tunica albuginea
(b) leydig cell
(c) seminiferous tubule
(d) sertoli cell

32. The hormone that supports pregnancy and stimulates mammary glands for the formation of alveoli for storing milk, is secreted from
(a) anterior Pituitary (b) posterior pituitary
(c) graafian follicle (d) corpus luteum

33. During pregnancy corpus luteum
(a) degenerates.
(b) changes to corpus albicans.
(c) persists until parturition.
(d) persists upto the middle of pregnancy.

34. Hormone which helps in implantation of embryo in uterus is
(a) estrogen (b) oxytocin
(c) relaxin (d) progesterone

35. Secretion of which of the following structure is responsible in preparing the inner wall of uterus for implantation ?
(a) Ovary (b) Pituitary gland
(c) Corpus luteum (d) Ovarian follicle

36. Which of the following is a gastro-intestinal hormone?
(a) Cholinesterase (b) Enterokinase
(c) Secretin (d) Interocrinin

37. The hormone secretin is produced in
(a) pancreas and influences conversion of glycogen into glucose.
(b) small intestine and stimulates pancreas.
(c) adrenal glands and accelerates heartbeat.
(d) testes and produces male secondary sexual characters.

38. Which hormone interacts with membrane bound receptor and does not normally enter the target cell?
(a) FSH (b) Estrogen
(c) Thyroxine (d) Cortisol

39. Which one of the following is not a second messenger in hormone action ?
(a) Calcium (b) Sodium
(c) cAMP (d) cGMP

40. Receptors for protein hormones are found
(a) inside nucleus (b) inside cytoplasm
(c) on surface of ER (d) on cell surface

41. 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) ?
(a) Somatostatin, Oxytocin
(b) Cortisol, Testosterone
(c) Insulin, Glucagon
(d) Thyroxine, Insulin

42. Steroid hormones are produced only by the
(a) adrenal medulla and pancreas.
(b) thyroid gland and pancreas.
(c) anterior and posterior pituitary.
(d) sex organs and adrenal cortex.

STATEMENT TYPE QUESTIONS

43. Mark the correct statement regarding somatostatin.
(a) It is secreted from anterior pituitary.
(b) It inhibits the release of growth hormone.
(c) It is secreted from posterior pituitary.
(d) It stimulates STH secretion.

44. What of the following is correct about calcitonin ?
(a) It contains iodine.
(b) It is an amino acid.
(c) It is released from parathyroid.
(d) It is released from thyroid gland.

45. Which statement regarding PTH is correct?
(a) It is a peptide hormone.
(b) It stimulates bone resorption.
(c) It is hypercalcemic hormone.
(d) All of the above.

46. Which of the following statements is correct in relation to the endocrine system?
(a) Organs in the body like gastrointestinal tract, heart, kidney and liver do not produce any hormones.
(b) Non-nutrient chemicals produced by the body in trace amount that act as intercellular messenger are known as hormones.
(c) Releasing and inhibitory hormones are produced by the pituitary gland .
(d) Adenohypophysis is under direct neural regulation of the hypothalamus.

47. Which of the following is correct for thyrocalcitonin ?
(a) Produced by parathyroid and decreases Ca^{++} in ECF.
(b) Produced by thyroid and decreases Ca^{++} in ECF.
(c) Produced by parathyroid and increases Ca^{++} in ECF.
(d) Produced by thyroid and increases Ca^{++} in ECF.

48. One similarity between enzymes and hormones is that
(a) both are proteins.
(b) both can be used again and again.
(c) both are used in minute amount.
(d) both act at a particular pH.

49. Hormones of pituitary gland are
(a) some steroids and some proteins
(b) all proteins/peptides.
(c) complex substances formed from proteins, steroids, carbohydrates.
(d) all steroids.

50. Norepinephrine
(i) is released by sympathetic fibres.
(ii) is released by parasympathetic fibres.
(iii) increases the heart rate.
(iv) decreases blood pressure.
Which of the above said statements are correct?
(a) (i) and (ii) (b) (i) and (iii)
(c) (ii) and (iii) (d) (ii) and (iv)

51. Choose the correct statement about 'neurohypophysis' ?
(a) It stores and release hormones secreted by hypothalamus.
(b) It secretes its own hormones.
(c) It is poorly developed and functionless in humans.
(d) It stores the hormones produced by adenohypophysis.

52. Which of the following statement is correct regarding glucagon hormone ?
(a) It has opposite effect to that of insulin.
(b) It converts glucose to glycogen.
(c) It is given to diabetic patients.
(d) It is formed by β-cells of pancreas.

53. A woman may develop beard and moustaches due to
(a) hypersecretion of adrenal cortex.
(b) hypersecretion of thyroxine.
(c) hyposecretion of adrenaline.
(d) hyposecretion of thyroxine.

54. Which one of the following statement is correct?
(a) Endrocrine glands regulate neural activity and nervous system regulates endocrine glands.
(b) Neither hormones control neural activity nor the neurons control endocrine activity.
(c) Endocrine glands regulate neural activity, but not *vice versa*.
(d) Neurons regulate endocrine activity, but not *vice versa*.

55. Which of the following statement about the hormone action in humans is correct ?
(a) In females, FSH first binds with specific receptors on ovarian cell membrane.
(b) FSH stimulates the secretion of estrogen and progesterone.
(c) Glucagon is secreted by β-cells of Islets of langerhans and stimulates glycogenolysis.
(d) Secretion of thymosin is stimulated with ageing.

56. Which of the followings is the more scientific definition of hormone?
(a) They are extracellular messengers.
(b) They always act at distantly located target organ.
(c) They are the products of well organized endocrine glands.
(d) They are non-nutrient chemicals that act as intercellular messengers.

ASSERTION/REASON TYPE QUESTIONS

In the following questions, a statement of Assertion is followed by a statement of Reason.
(a) If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.
(b) If both Assertion and Reason are true but the Reason is not the correct explanation of the Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

57. **Assertion :** Mammary glands are apocrine glands.
Reason : The distal part containing secretory granules break down and leaves as a secretion.

58. **Assertion :** Hormone calcitonin has an antagonistic effect to that of parathormone.
Reason : Calcitonin decreases blood calcium level while parathormone increases blood calcium level.

59. **Assertion :** The person with diabetes insipidus feels thirsty.
Reason : A person with diabetes insipidus suffers from excess secretion of vasopressin.

60. **Assertion:** Failure of secretion of hormone vasopressin causes diabetes mellitus in the patient.
Reason: Vasopressin increases the volume of urine by increasing the reabsorption of water from the urine.

61. **Assertion :** Histamine is involved in allergic and inflammatory reactions.
Reason : Histamine is a vasodilator.

MATCHING TYPE QUESTIONS

62. Select the correct match of a hormone with its source and function.

	Hormone	Source	Function
(a)	Vasopressin	Posterior pituitary	Increases loss of water through urine.
(b)	Nor-epinephrine	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.

63. Which one of the following four glands is correctly matched with the accompanying description?

(a) Thyroid – Hyperactivity in young children causes cretinism.
(b) Thymus – Starts undergoing atrophy after puberty.
(c) Parathyroid – Secretes parathormone which promotes movement of calcium ions from blood into bones during calcification.
(d) Pancreas – Delta cells of Islets of Langerhans secrete a hormone which stimulates glycolysis in liver.

64. Match the hormones given in column-I with the terms given in column-II

	Column -I		Column-II
A.	ADH	I.	Pituitary
B.	ACTH	II.	Mineralocorticoid
C.	Aldosterone	III.	Diabetes mellitus
D.	Insulin	IV.	Diabetes insipidus
E.	Adrenaline	V.	Vasodilator

(a) A – I, B – IV, C – II, D – III, E – V
(b) A – IV, B – II, C – I, D – III, E – V
(c) A – IV, B – I, C – II, D – III, E – V
(d) A – IV, B – I, C – III, D – II, E – V

65. Column-I lists the endocrine structure and column-II lists the corresponding hormones. Match the two columns and identify the correct option given below.

	Column-I		Column-II
A.	Hypothalamus	I.	Relaxin
B.	Anterior pituitary	II.	Estrogen
C.	Testis	III.	FSH and LH
D.	Ovary	IV.	Testosterone
		V.	Gonadotropin releasing hormone

(a) A – V, B – III, C – IV, D – II
(b) A – V, B – III, C – II, D – IV
(c) A – I, B – II, C – IV, D – III
(d) A – III, B – V, C – IV, D – II.

66. Match the hormone given in column-I with their function in given in column-II.

	Column-I		Column-II
A.	FSH	I.	Prepare endometrium for implantation
B.	LH	II.	Develops female secondary sexual characters
C.	Progesterone	III.	Contraction of uterine wall
D.	Estrogen	IV.	Development of corpus luteum
		V.	Maturation of Graafian follicle

(a) A – V, B – IV, C – I, D – II
(b) A – IV, B – V, C – II, D – I
(c) A – IV, B – III, C – II, D – V
(d) A – V, B – I, C – II, D – IV

67. Which one of the following pairs is incorrectly matched?
(a) Insulin–Diabetes mellitus (disease)
(b) Glucagon–Beta cells (source)
(c) Somatostatin–Delta cells (source)
(d) Corpus luteum–Relaxin (secretion)

68. Match the endocrine gland as a source with its respective hormone as well as the function.

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

69. Which of the following pair of hormone and their disorder is correctly matched ?
(a) Parathormone – Cretinism
(b) Thyroxine – Ricket
(c) Insulin – Diabetes insipidus
(d) Cortisol – Cushing's disease

70. Mark the hormone given in column I and the endocrine cells given in column II.

	Column-I		Column-II
A.	α-cell	I.	Inhibin
B.	β-cell	II.	Glucagon
C.	Leydig cell	III.	Insulin
D.	Sertoli cells	IV.	Testosterone

(a) A – I, B – III, C – IV, D – II
(b) A – III, B – II, C – IV, D – I
(c) A – I, B – III, C – II, D – IV
(d) A – II, B – III, C – IV, D – I

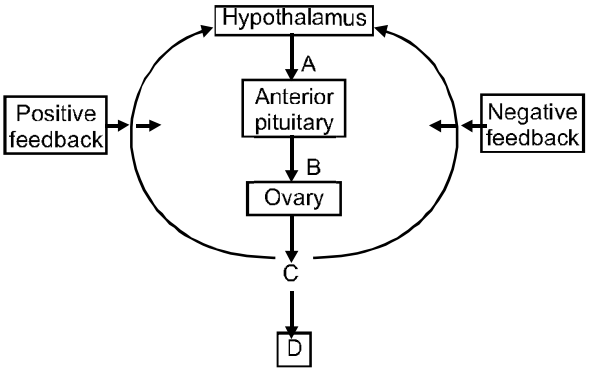
71. Match the following hormones given in column I with their appropriate category of hormones given in column II.

	Column-I (Hormones)		**Column-II (Categories)**
A.	FSH and LH	I.	Glucocorticoids
B.	Cortisol	II.	Mineralocorticoids
C.	Androgen	III.	Gonadotropins
D.	Aldosterone	IV.	Gonadocorticoids

(a) A – III, B – I, C – IV, D – II
(b) A – I, B – II, C – III, D – IV
(c) A – II, B – III, C – IV, D – I
(d) A – IV, B – II, C – I, D – III

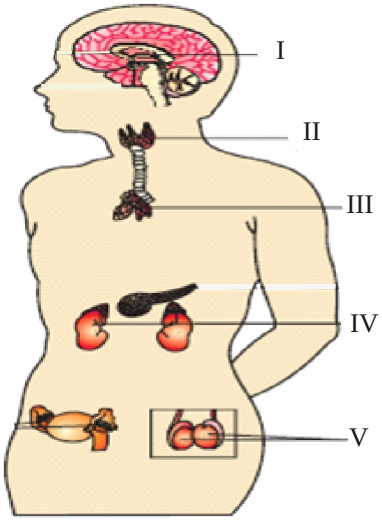
DIAGRAM TYPE QUESTIONS

72. The given figure shows the hormonal control of female reproductive system in which few steps are marked as A, B, C and D. Identify the correct labelling.



(a) A- GnRH, B - TSH, C - LTH, D - Uterus
(b) A - GnRH, B - FSH/LH, C - Estrogen or progesterone, D - urerus
(c) A - GnRH, B - STH, C - LH, D - Uterus
(d) A - GnRH, B - ACTH, C - LH, D - Uterus

73. The given diagram represents the location of human endocrine glands I, II, III, IV and V.

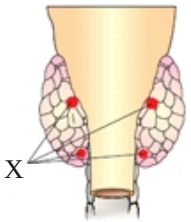


Which of the following gland is correctly matched with their secretions?

	Hormones	**Their secretions**
A	I	Melatonin
B	II	Thymosin
C	III	Epinephrine
D	IV	Aldosterone
E	V	Testosterone

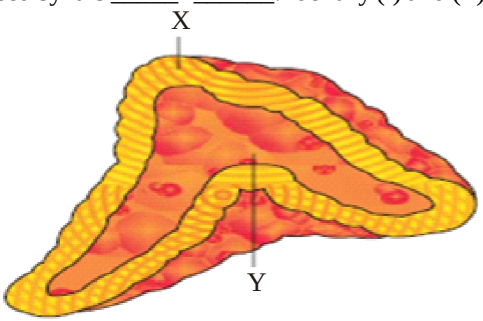
(a) I, II and III only (b) I, IV and V only
(c) II, IV, and V only (d) II, III and V only

74. The hormone released by label "X" in the given figure helps to restore Y. Identify X and Y.



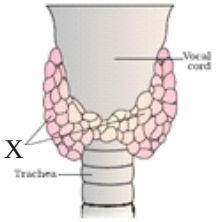
	X	Y
(a)	Thyroxine	Too much calcium in the blood.
(b)	PTH	Lowered levels of calcium in blood.
(c)	Thymosin	Decreased level of blood sugar.
(d)	Adrenaline	Excessive loss of sodium in extracellular fluid.

75. The label X represents ___i_____ and the hormone released by it is _____ii_____. Identify (i) and (ii)



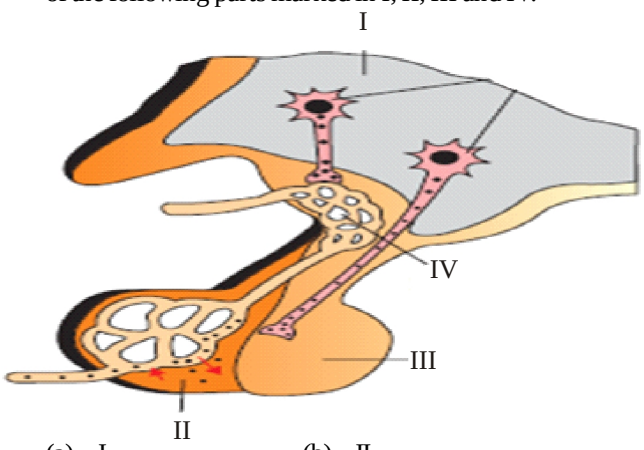
(a) i- Adrenal cortex, ii- Epinephrine
(b) i- Adrenal cortex, ii- Aldosterone
(c) i- Adrenal medulla, ii- Epinephrine
(d) i- Adrenal medulla, ii- Aldosterone

76. Which of the following disease is caused due to over secretion of the structure marked as X?



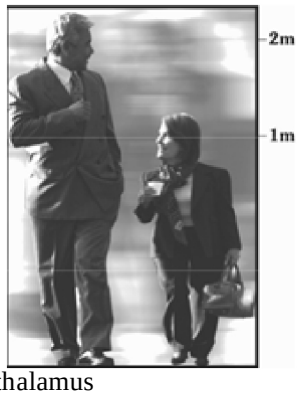
(a) Gigantism
(b) Diabetes mellitus
(c) Diabetes insipidus
(d) Grave's disease

77. The Hypophyseal portal system transports releasing and inhibiting hormones from the hypothalamus into which of the following parts marked in I, II, III and IV.



(a) I (b) II
(c) III (d) IV

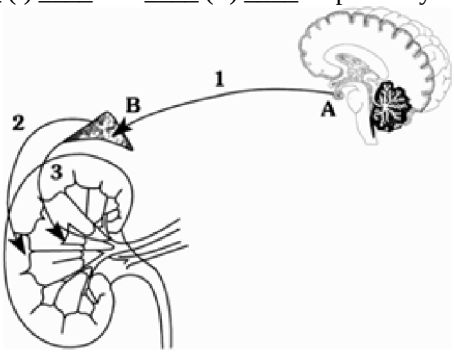
78. Which endocrine gland secretes the hormone that causes the abnormalities shown in the below picture?



(a) Hypothalamus
(b) Pancreas
(c) Adenohypophysis
(d) Neurohypophysis

Direction (For Qs. 79 and 80) :

The endocrine glands A and B in the given figure represent ___ (i) ____ and ____ (ii) ____ respectively.



79. Identify (i) and (ii)
(a) i- Pituitary gland , ii- Adrenal gland
(b) i- Hypothalamus, ii- Pituitary gland
(c) i- Hypothalamus, ii- Adrenal gland
(d) i- Pituitary gland, ii- Hypothalamus

80. Identify the hormone represented by lines 1 and 2?
(a) 1- ACTH, 2- Aldosterone
(b) 1- ACTH, 2- Adrenaline
(c) 1- TSH, 2- Thyroxine
(d) 1- TSH, 2- Aldosterone

CRITICAL THINKING TYPE QUESTIONS

81. In hormone action, if receptor molecules are removed from target organ, the target organ will
(a) continue to respond to hormone.
(b) not respond to hormone.
(c) continue to respond but requires higher concentration.
(d) continue to respond but in the opposite way.

82. The number of hormones secreted by anterior pituitary is
(a) 3 (b) 4
(c) 6 (d) 8

83. Which hormone is related to mineral metabolism but is not a peptide / protein in nature ?
(a) PTH (b) ANF
(c) Aldosterone (d) All of the above

84. Pancreatic duct of a healthy dog is blocked. Which of the following function of pancreas will not be affected ?
(a) Maintenance of normal blood sugar level.
(b) Carbohydrate digestion.
(c) Protein digestion.
(d) Neutralization of chyme.

85. A decrease in the level of estrogen and progesterone causes
(a) growth and dilation of myometrium.
(b) growth of endometrium.
(c) constriction of uterine blood vessels leading to sloughing of endometrium or uterine epithelium.
(d) release of ovum from the ovary.

86. Which of the following endocrine glands grows to the maximum size at puberty and then diminishes gradually?
(a) Thymus (b) Pituitary
(c) Thyroid (d) Adrenal

87. Which one is different from the category of other three?
(a) Gastrin (b) Ptyalin
(c) Secretin (d) Glucagon

88. Which of the following disorders are caused by hypersecretion of their concerned hormones ?
(a) gigantism and exophthalmic goitre
(b) tetany and myxoedema
(c) diabetes mellitus and goitre
(d) rickets and diabetes insipidus

89. Hormones produced by anterior lobe of pituitary
(a) control calcium level in blood.
(b) stimulate thyroid and other endocrine glands.
(c) initiate alarm reaction.
(d) regulate water balance in body.

90. Growth hormone of pituitary is more effective in
(a) presence of thyroxine.
(b) absence of thyroxine.
(c) absence of insulin.
(d) presence of adrenaline.

91. Which of the following hormone helps a person who suffers from a marked fall in blood pressure ?
(a) Insulin (b) Thyroxine
(c) GH (d) Adrenaline

92. Hormones involved in carbohydrate metabolism are
(a) insulin, glucagon, epinephrine and calcitonin
(b) insulin, glucagon, epinephrine and glucocorticoids
(c) insulin, glucagon, cortisol and melatonin
(d) insulin, glucagon, norepinephrine and melatonin

93. Which of the following hormones are identical?
(a) ACTH and adrenaline
(b) hCG and progesterone
(c) Calcitonin and Oxytocin
(d) Vasopressin and ADH.

94. A man suffering from diabetes mellitus drinks water more frequently as he has to eliminate from blood, the extra
(a) salts (b) sugar
(c) insulin (d) protein

95. Which hormone promotes cell division, protein synthesis and bone growth?
(a) GH (b) ADH
(c) ACTH (d) PTH

96. Injection of glucagon will
(a) cause goitre
(b) cause galactosemia
(c) cause hypoglycemia
(d) increase blood sugar level

97. A person who has protruding eyes, tachycardia and higher body temperature is suffering from
(a) cretinism (b) hyperthyroidism
(c) myxoedema (d) acromegaly

98. Point out the odd one:
(a) Corticotropin (b) Vasopressin
(c) Noradrenaline (d) Prolactin

99. When a boy goes through puberty, the steroid hormone testosterone puts hair on his chest by
(a) interacting with DNA in the nuclei of cells.
(b) causing cells to change shape.
(c) altering the permeability of plasma membranes.
(d) triggering nerve impulses in cells.

100. A patient of diabetes mellitus excretes glucose in urine even when he is kept in a carbohydrate free diet. It is because
(a) fats are catabolised to form glucose.
(b) amino acids are catabolised in liver.
(c) amino acids are discharged in blood stream from liver.
(d) glycogen from muscles are released in the blood stream.

101. Identify a hormone which is produced by the pituitary gland in both males and females but functional only in females.
(a) Vasopressin (b) Relaxin
(c) Prolactin (d) Somatotropic hormone

102. Low level of progesterone and estrogen in blood stimulate
(a) FSH-RH production
(b) LH production
(c) GH production
(d) All of the above

103. Some glands produce hormones that stimulate other endocrine glands. Which of the following hormones specifically acts to trigger secretion of hormones by another endocrine gland?
(a) Thyroxine
(b) Progesterone
(c) Adrenocorticotropic hormone (ACTH)
(d) Antidiuretic hormone (ADH)

104. Which hormone causes dilation of blood vessels, increased oxygen consumption and glucogenesis?
(a) Insulin (b) Adrenaline
(c) Glucagon (d) ACTH

105. In the homeostatic control of blood sugar level, which organs function respectively as modulator and effector?
(a) Liver and islets of langerhans
(b) Hypothalamus and liver
(c) Hypothalamus and islets of langerhans
(d) Islets of langerhans and hypothalamus

106. ADH, responsible for reabsorption of water and reduction of urine secretion, is synthesized by
(a) posterior pituitary gland
(b) juxtaglomerular apparatus
(c) hypothalamus
(d) anterior pituitary gland

107. The hormones that initiate ejection of milk, stimulates milk production and growth of ovarian follicles, are respectively known as
(a) PRL, OT and LH (b) OT, PRL and FSH
(c) LH, PRL and FSH (d) PRH, OT and LH

108. Hypothyroidism in adults and hyperparathyroidism in children will respectively lead to
(a) myxoedema and cretinism
(b) Grave's disease and Hashimoto's disease
(c) myxoedema and osteitis fibrosa cystica
(d) Addison'a disease and cretinism

109. 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?
(a) Gastrin (b) Thyroxine
(c) Adrenaline (d) Glucagon

110. A person is having problems with calcium and phosphorus metabolism in his body. Which one of the following glands may not be functioning properly?
(a) Thyroid (b) Parathyroid
(c) Parotid (d) Pancreas

111. A pregnant female deliver 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

112. A health disorder that results from the deficiency of thyroxine in adults and characterized by a low metabolic-rate, increase in body weight and tendency to retain water in tissues is
(a) cretinism (b) hypothyroidism
(c) simple goitre (d) myxoedema

113. In a normal pregnant woman, the amount of total gonadotropin activity was assessed. The result expected was
(a) high levels of FSH and LH in uterus to stimulate endometrial thickening.
(b) high level of circulating HCG to stimulate estrogen and progesterone synthesis.
(c) high level of circulating FSH and LH in the uterus to stimulate implantation of the embryo.
(d) high level of circulating HCG to stimulate endometrial thickening.

114. STH or growth hormone (A) differs from insulin (B) in which of the following action ?
(a) (A) causes glycogenesis but (B) causes glycolysis.
(b) (A) causes lipolysis but (B) causes lipogenesis.
(c) (A) is catabolic for protein but (B) is anabolic.
(d) (A) causes glycogenolysis but (B) causes glycogenesis.

115. When the B.P. is high and over loading of heart is present then which hormone is released for compensating this mechanism ?
(a) Aldosterone
(b) A.D.H
(c) Atri-natriuretic factor
(d) Renin

116. The hormone ANP (Atrial Natriuretic Peptide)
(a) stimulates the secretion of ADH and aldosterone.
(b) inhibits the secretion of aldosterone but stimulates ADH secretion.
(c) stimulates the secretion of renin.
(d) inhibits the secretion of ADH, aldosterone and renin.

117. Pick the odd one out from each given words and then matches it with correct options.
I. Thyroid, Adrenal, Pituitary, Prostate
II. Cretinism, Goitre, Myxodema, Scurvy
III. Insulin, Blood sugar, Adrenaline, Thyroxine
IV. Estrogen, Progesterone, Testosterone, Prolactin
(a) I- Prostate, II- Scurvy, III- Blood sugar, IV- Testosterone
(b) I - Adrenal, II - Goitre, III - Insulin, IV - Prolactin
(c) I - Thyroid, II - Cretinism, III - Adrenaline, IV - Estrogen
(d) I - Pituitary, II - Myxodema, III - Thyroxine, IV - Progesterone

118. Tim once suffered a severe allergic reaction to a bee sting. The sting caused him to suffer a near-fatal drop in blood pressure called anaphylactic shock. Now he carries a kit containing a syringe of _____, which he can inject to speed up his heart if he reacts to a bee sting.
(a) insulin (b) melatonin
(c) testosterone (d) epinephrine

119. Which of the following sets of vertebrate hormones are all produced in the anterior pituitary gland ?
(a) Somatostatin, Vasopressin, Insulin
(b) Prolactin, Growth hormone, Enkephalins
(c) Oxytocin, Prolactin, Adrenocorticotropin
(d) Estrogen, Progesterone, Testosterone

120. Given below is an incomplete table about certain hormones, their source glands and one major effect of each on the body in humans. Identify the correct option for the three blanks A, B and C

GLANDS	**SECRETION**	**EFFECT ON BODY**
A	Oestrogen	Maintenance of secondary sexual characters
Alpha cells of Islets of Langerhans	**B**	Raises blood sugar level
Anterior pituitary	**C**	Over secretion leads to gigantism

Options:

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

121. Which of the following represent the correct options?

Name of the gland	**Substance produced**	**Function**
A	Insulin	C
B	Glucagon	D

(a) A - Alpha cells, B - Hyperglycemia, C - Beta cells, D - Hypoglycemia
(b) A - Beta cells, B - Alpha cells, C - Hypoglycemia, D - Hyperglycemias
(c) A - Alpha cells, B - Hypoglycemia , C - Beta cells, D - Hyperglycemia
(d) A - Beta cells, B - Alpha cells, C - Hyperglycemia, D - Hypoglycemia

Hints & Solutions

Chapter 22 : Chemical Coordination and Integration

1. **(d)** Anterior lobe of pituitary secretes follicle stimulating hormones, growth hormone and luteinizing hormone.

2. **(d)** GH (growth hormone), secreted from anterior pituitary gland, stimulates growth of body by synthesis and deposition of protein in tissue, increase glucose level in blood by decreased secretion of insulin, increased cell division ad increased growth of bones by increased absorption of calcium from intestine. Hyper secretion of GH leads to acromegaly in adults which is characterised by gorilla like appearance with huge hand and legs.

3. **(b)** Adrenocorticotrophic hormone (ACTH) is secreted by anterior pituitary.

4. **(d)** LH is a luteinizing hormone which stimulates the non - empty follicle to develop into corpus luteum. Corpus luteum secretes progesterone hormone during the latter half of the menstrual cycle which maintain pregnancy.

5. **(a)** Oxytocin hormone is produced by posterior lobe of pituitary under the influence of nervous stimulation. It causes contraction of the smooth muscles of the uterus and myoepithelial cells lining the duct of the mammary gland. Hence it is also called as birth hormone and milk ejection hormone.

6. **(d)** Ovulation (release of graafian follicle from the ovary) is controlled by FSH and LH.

7. **(b)** FSH (Follicle Stimulating Hormone), secreted by anterior pituitary gland, is a gonadotrophic hormone. It stimulates spermatogenesis and growth of seminiferous tubules in testes in male and maturation of Graafian follicle and secretion of estrogen and progesterone from corpus luteum in female.

8. (a) Melanocyte Stimulating Hormone (MSH) is secreted by pars intermedia. MSH acts on melanocytes to regulate pigmentation of skin.

9. (b) Secretion of estrogen is stimulated by FSH of anterior pituitary gland.

10. (a) Deficiency of ADH (vasopressin) causes diabetes insipidus (increased volume of urine). It is caused due to decreased reabsorption of water from collecting tubules.

11. (b) Melatonin, secreted by pineal gland, is called as anti-ageing hormone.

12. (b) Melatonin regulates the diurnal *i.e.* 24-hour rhythm of body. *e.g.* maintenance of sleep-wake cycle, body temperature etc. It influences metabolism, pigmentation and menstrual cycle.

13. (a) ADH, secreted by posterior pituitary gland, acts on kidney. It concentrates the urine by promoting the reabsorption of water and salts into the cortical collecting ducts. Therefore, when the amount of ADH decreases in blood, micturition will increase.

14. (a) ADH, secreted by posterior pituitary gland, acts on kidney. It concentrates the urine by promoting the reabsorption of water and salts into the cortical collecting ducts.

15. (b) ADH, secreted by posterior pituitary gland, acts on kidney. It concentrates the urine by promoting the reabsorption of water and salts into the cortical collecting ducts. Therefore, when the amount of ADH decreases in blood, micturition will increase with increased water in urine.

16. (c) ADH (or vasopressin) is secreted by posterior pituitary gland. It acts on kidney tubule and blood capillaries and concentrates the urine by promoting the reabsorption of water and salts into the cortical collecting ducts.

17. (c) In thyroid gland, thyroxine hormone is stored in extracellular spaces before discharging it into the blood. These hormones are stored in the follicular cells in the form of colloidal suspension called thyroglobulin.

18. (d) Thyrocalcitonin opposes parathormone. Calcitonin, secreted from parafollicular cells in thyroid gland, plays a role in calcium and phosphorus metabolism.

19. (c) Hypothyroidism of T_3 and T_4 during fetal life and infancy leads to cretinism. It is a condition characterized by the retarded mental development, stunted growth, delayed puberty, decreased heart rate, pulse rate, blood pressure etc, reduced urine output, pigeon's chest etc.

20. (b) Thyroxine does not act on testis. It is a hormone which is secreted from thyroid gland and plays an important role in the body's metabolisms and calcium balance.

21. (d) All the organs or tissues listed are influenced by parathyroid hormone like, kidneys- reabsorption of calcium; bones- release of calcium and small intestine-absorption of calcium.

22. (a) Thymus is related to AIDS as it the first developing lymphoid organ whose main function is to develop immature T cells into immunocompetent T cells. AIDS (acquired immune deficiency syndrome) is a disease in which there is a severe loss of the body's cellular immunity, greatly lowering the resistance to infection and malignancy.

23. (d) Thymus secretes a peptide hormone called "thymosins" that imparts resistance to diseases.It helps in differentiation of T-lymphocytes, which provide cell mediated immunity.It promotes production of antibodies for humoral immunity.

24. (b) Deficiency of aldosterone and cortisol causes Addison's disease. It is characterized by bronze-like skin colouration, hyponatraemia, hyperkalaemia, low blood sugar, nervous depression, nausea, vomiting, weakness and diarrhoea.

25. (a) Cortisol is secreted by the middle region of adrenal cortex. It increases the blood glucose level (which is anti-insulin effect) by converting proteins & fats into glucose.

26. (d) Adrenal gland (adrenaline hormone) is also called as triple F gland for flight, fright and fight reaction which occurs in condition of emergency. Hence it is also called as emergency hormone.

27. (b) Insulin is a hypoglycemic factor, secreted by β- cells. It stimulates glycogenesis (conversion of glucose to glycogen).

28. (b) Deficiency of ADH causes diabetes insipidus. It is caused due to decreased reabsorption of water from collecting tubules.

29. (c) Glucagon and insulin regulates the level of blood in man. Both the hormone is secreted from alpha and beta cell of pancreas respectively. Glucagon is secreted when the blood sugar level is low and it stimulates glycogen breakdown and glucose synthesis in the liver by increasing blood glucose concentration. Whereas rising level of blood glucose stimulates insulin secretion.

30. (a) Insulin, glucagon and somatostatin are secreted from beta, alpha and delta cells of the pancreas respectively.

31. (b) Leydig (interstitial) cells in the inter-tubular spaces are stimulated to secrete male sex hormone called androgens (mainly testosterone), under the influence of ICSH of anterior pituitary.

32. (d) Corpus luteum secretes the hormone progesterone that supports pregnancy and stimulates mammary glands for formation of alveoli for storing milk.

33. (d) During pregnancy corpus luteum persists up-to the middle of pregnancy. Corpus luteum is a hormone-secreting structure that develops in an ovary after

an ovum has been discharged in a process called ovulation.

34. (d) Progesterone stimulates proliferation of endometrium of uterus and prepares it for implantation of blastocysts.

35. (c) Corpus luteum is a yellow, progesterone-secreting mass of cells that forms from an ovarian follicle after the release of a mature egg. It prepares the inner wall of the uterus for implanting the zygote (blastocysts) and maintains the pregnancy.

36. (c) Secretin is a hormone which is released into the bloodstream by the duodenum under the influence of stomach acid. It stimulates secretion of liver and pancreas.

37. (b) Secretin is a hormone which is released into the bloodstream by the wall of the upper part of the small intestine (the duodenum) under the influence of stomach acid. It stimulates secretion of liver and pancreas.

38. (a) Follicle Stimulating Hormone (FSH) produces its effect by binding to its specific receptors present on the ovarian cell membrane.

39. (b) In heart cells AMP acts as secondary messenger which is made in the response of adrenaline and it stimulates Ca^{2+} ions to come out from the sarcoplasmic reticulum of muscle fibres which causes muscle contraction.
cGMP (Cyclic Guanosine Monophosphate) which acts as secondary messenger works on the action of acetylcholine, increase in flow of Ca^{2+} into muscle fibres & hence causes muscle relaxation. There is no role of sodium in hormonal action.

40. (d) Receptors for protein hormone are found on the cell surface.

41. (b) Cortisol and testosterone are the steroidal hormones. They can easily pass through both the plasma membrane and nuclear membrane.

42. (d) The sex hormones, glucocorticoids, and mineralocorticoids are steroid hormones.

43. (b) Somatostatin also called growth inhibiting hormone inhibits release of growth hormone from pituitary.

44. (d) Thyrocalcitonin (TCT) is secreted by parafollicular cells of thyroid gland.

45. (d) All the statements are correct regarding PTH. PTH (Parathyroid Hormone), also called Collip's hormone, is secreted from the parathyroid gland. It is responsible for the following:
(i) Release of calcium by ones into the blood streams.
(ii) Absorption of food by the intestine.
(iii) Conservation of calcium by the kidneys.

46. (b) Hormones are non-nutrient chemicals which act as intercellular messengers and are produced in trace amounts.
Gastrointestinal tracts secretes four major peptide hormones – gastrin, secretin, cholecystokinin (CCK) and gastric inhibitory peptide (GIP) while juxtaglomerular cells of kidney secretes erythropoietin, a peptide hormone. Releasing and inhibitory hormones are produced by hypothalamus. Neurohypophysis or posterior pituitary is under direct neural regulation of the hypothalamus.

47. (b) Thyrocalcitonin (TCT) is secreted by parafollicular cells of thyroid gland. It is a protein hormone that regulates (lowers) the blood calcium levels in blood plasma.

48. (c) Both enzymes and hormones are used in minute quantities.

49. (b) All the hormones secreted from pituitary gland are proteins or peptides.

50. (b) Norepinephrine is released by sympathetic fibres *i.e*, rapidly secreted in response to stress of any kind and during emergency situations. It increases the heart beat, the strength of heart contraction and the rate of respiration.

51. (a) Neurohypophysis is a posterior part of pituitary gland. It stores the hormones (ADH and oxytocin) which is synthesised in the hypothalamus and releases them on their requirement.

52. (a) Glucagon is secreted from the alpha cells of pancreas when the blood sugar level is low. It stimulates glycogen breakdown and glucose synthesis in the liver by increasing blood glucose concentration. It has opposite effect to that of insulin because insulin is released when the level of blood sugar is high.

53. (a) The over secretion of androgenic corticoid, by adrenal cortex, in female causes adrenal virilism in which male type secondary sexual characters appear in female. In male, it causes gynaecomastia (enlarged breasts in male).

54. (a) Endocrine glands regulate neural activity and nervous system regulates endocrine glands.

55. (a)

56. (d) Hormones are chemical messengers of the body that transfers information from one set of cells to another.

57. (a) Based on the mode of secretion, the glands are of three types : mesocrine, apocrine and holocrine. Mammary glands that are present in mammals to feed the young ones with milk are the example of apocrine glands. In apocrine glands, the secretion accumulates as secretory granules in the distal part of the cell. This part later breaks down and leaves as a secretion.

58. (a) Calcitonin or thyrocalcitonin is secreted by parafollicular cells of thyroid stroma. It retards bone dissolution and stimulates excretion of calcium in urine. Thus, it lowers calcium level in extra cellular fluid (ECF). Parathormone is secreted by chief cells of parathyroid gland and is also known as Collip's

hormone. It maintains blood calcium level by increasing its absorption from food in intestine and its reabsorption from nephrons in the kidney. Maintenance of proper calcium level is in fact, a combined function of parathormone and calcitonin. When calcium level falls below normal parathormone maintains it by promoting its absorption, reabsorption and also by demineralisation of bones. When blood calcium level exceeds above normal, then calcitonin hormone increases excretion of calcium in urine.

59. (c) Vasopressin or antidiuretic hormone is secreted by posterior pituitary gland. The deficiency of vassopressin results in a disorder known as diabetes insipidus. The main symptoms of diabetes insipidus are increase in thirst and increase in urination.

60. (d) Vasopressin or anti-diuretic hormone (ADH) reduces the volume of urine by increasing the reabsorption of water from the urine in the distal convoluted tubules, collecting tubules and collecting ducts in the kidney. It does so by rendering the walls of these tubules leads to diabetes insipidus (increased urination). Although the volume of urine is increased. No glucose appears in the urine of such patients.
Diabetes mellitus is a disease which is caused due to the failure of insulin hormone secretion by the pancreatic islets. The osmotic effect of glucose in the urine considerably increases the volume of urine, due to which thirst is also enhanced. In extreme cases, the patient suffers from coma and may die.

61. (a) Histamine is a derivative of the amino acid histidine produced by damaged cells of vertebrates. When released, it has the effect of dilating capillaries and lowering blood pressure. Histamine is involved in allergic and inflammatory reactions also.

62. (b) Nor-epinephrine is secreted by adrenal medulla region. It increases the heartbeat, rate of respiration and alertness.

63. (b) Thymus starts functioning in the embryonic stage itself, becomes active during childhood and undergoes regression and gradually stops functioning in old individuals. So, production of thymosins decreases. As a result, immune responses of old persons become weak.

64. (c) ADH, secreted by posterior pituitary gland, acts on kidney. It concentrates the urine by promoting the reabsorption of water and salts into the cortical collecting ducts. Its deficiency will results in diabetes insipidus. ACTH (adrenocorticotrophic hormone) is secreted by anterior pituitary gland. It controls the structure and function of adrenal cortex especially secretion of glucocorticoids and sex corticoids. Aldosterone is a type of mineralocorticoids. It is a salt retaining hormone which is secreted in response to increased potassium levels or decreased blood flow and sodium to the kidney. Insulin is secreted when the blood glucose level is high. Its deficiency will result in diabetes mellitus. Adrenaline is secreted from adrenal medulla and acts as vasodilator.

65. (a) Hypothalamus releases gonadotrophic releasing hormones. FSH and LH are gonadotrophic hormones, secreted from the anterior pituitary gland. Testosterone is the most abundant androgen released by the leydig cells. Estrogen is mainly secreted by follicular epithelial cells of granulosa membrane of Graafian follicle.

66. (a) FSH and LH are gonadotrophic hormones, secreted from the anterior pituitary gland. Corpus luteum secretes progesterone hormone. Estrogens are released from the ovarian follicle.

67. (b) Glucagon is secreted by alpha cells.

68. (c) Thyroid secretes thyroxine hormone and plays an important role in the body's metabolisms and calcium balance. Oxytocin is secreted from the posterior pituitary gland. It causes contraction of the smooth muscles of the uterus and myoepithelial cells lining the duct of the mammary gland. Hence it is also called as birth hormone and milk ejection hormone. Corpus luteum secretes progesterone hormone which supports pregnancy.

69. (d) Over secretion of cortisol causes Cushing disease. This disease mainly occurs in females and causes obesity hypertension, glycosuria, etc.

70. (d) Glucagon is secreted from the alpha cells of pancreas when the blood sugar level is low. It stimulates glycogen breakdown and glucose synthesis in the liver by increasing blood glucose concentration. Whereas rising level of blood glucose stimulates insulin secretion from the beta cells of pancreas. Leydig cells secretes testosterone hormone and sertoli cells secretes inhibin.

71. (a) Hormones and their appropriate categories are:
A. FSH and LH- Gonadotropins
B. Cortisol- Glucocorticoids
C. Androgens- Gonadocorticoids
D. Aldosterone- Mineralocorticoids

72. (b)

73. (b)

	Glands	Their secretions (Hormones)
I.	Pineal gland	Melatonin
II.	Thyroid gland	Calcitonin and thyroxine
III.	Thymus	Thymosin
IV.	Adrenal gland	Aldosterone
V.	Testis	Testosterone

74. (b) The label X represents parathyroid gland. It helps to restore lowered levels of calcium in blood.
Too much calcium in the blood is restored by calcitonin, secreted by thyroid gland.
Decreased level of blood sugar is restored by insulin, secreted by pancreas.
Excessive loss of sodium in extracellular fluid is restored by aldosterone, secreted by adrenal gland.

75. (b) The label X represents adrenal cortex and the hormone secreted by it is aldosterone.
The label Y represent adrenal medulla and the hormone secreted by it is epinephrine.

76. (d) The label X represents thyroid gland. The over-secretion of thyroid gland may lead to Grave's disease. Grave's disease is categorized as an autoimmune disorder.

77. (b) The hypophyseal portal system transports releasing and inhibiting hormones from the hypothalamus into the anterior pituitary, which is labelled as II in the given diagram. The label I represents hypothalamus, label III represents posterior pituitary and label IV represents portal circulation.

78. (c) The given picture shows the disorders (gigantism and dwarfism) which occurs due the abnormal secretion of GH (growth hormones). GH is secreted from the adenohypophysis (anterior pituitary gland).

79. (a) (i) and (ii) are respectively pituitary gland and adrenal gland respectively.

80. (a) The hormone representing by lines 1 and 2 are respectively ACTH and aldosterone. ACTH (adrenocorticotrophic hormone) is secreted by anterior pituitary gland. It controls the structure and function of adrenal cortex especially secretion of glucocorticoids and sex corticoids. Aldosterone is a type of mineralocorticoids secreted from adrenal cortex. It is a salt retaining hormone which is secreted in response to increased potassium levels or decreased blood flow and sodium to the kidney.

81. (b) Hormones produce their effects by binding to the specific receptors located in the target tissues.

82. (c) The number of hormones secreted by anterior pituitary are six- growth hormone, prolactin, TSH, ACTH, LH and FSH.

83. (c) Aldosterone is a type of mineralocorticoids secreted from adrenal cortex. It is a salt retaining hormone which is secreted in response to increased potassium levels or decreased blood flow and sodium to the kidney.

84. (a) Pancreas being an endocrine gland, releases insulin into the blood. Insulin maintains the normal blood sugar level.

85. (c) Estrogen and progesterone hormones help to maintain pregnancy. A decrease level of both the hormones causes constriction of uterine blood vessels leading sloughing of endometrium or uterine epithelium in the menstrual period.

86. (a) Thymus starts functioning in the embryonic stage itself, becomes active during childhood and undergoes regression and gradually stops functioning in old individuals. So, production of thymosins decreases. As a result, immune responses of old persons become weak.

87. (b) Ptyalin is a salivary enzyme in the saliva that converts starch into dextrin and maltose.

88. (a) Gigantism and exophthalmic goitre are the disorders which occurs due to hyper secretion of growth hormone (secreted from anterior pituitary gland) and thyroxine (secreted from the thyroid gland) respectively.

89. (b) Hormones secreted from anterior pituitary glands stimulates thyroid and other endocrine glands like adrenal, parathyroid, ovary, testes, pancreas etc.

90. (a) Growth hormone of pituitary is more effective in presence of thyroxine hormone.

91. (d) Adrenaline caused an increase in systolic blood pressure, a decrease in diastolic blood pressure, and an increase in heart rate. Therefore it is given to those patients who suffer from a marked fall in their blood pressure.

92. (b) Carbohydrate metabolism represents the various biochemical processes which is responsible for the formation, breakdown and inter-conversion of carbohydrates in living organisms. Hormones involved in this metabolism are insulin, glucagon, epinephrine and glucocorticoids.

93. (d) Vasopressin and ADH are identical. Vasopressin or Anti-diuretic hormone (ADH) stimulates the reabsorption of water and electrolytes by DCT of kidney and thereby reduces diuresis (loss of water through urine).

94. (b) The prolonged hyperglycemia leads to diabetes mellitus**.** Diabetes mellitus is defined as abnormal high glucose level in blood, which results in release of sugar in urine and formation of toxic ketone bodies. The individual suffering from diabetes mellitus drinks water frequently to remove sugar from blood.

95. (a) Somatotropin or Growth Hormone (GH) is involved in growth and development of body. It targets the bone, muscle and adipose tissue.

96. (d) Glucagon is a hyperglycemic factor secreted by alpha-cells of pancreas. Its secretion is stimulated by low blood sugar level.

97. (b) Hyperthyroidism is the over-activity of the thyroid gland, resulting in a rapid heartbeat and an increased rate of metabolism.

98. (c) 99. (a) 100. (a)

101. (c) In females, prolactin (PRL) regulates growth of mammary glands and formation of milk after the birth of baby.

102. (a) FSH RH (Follicle Stimulating Hormone - Releasing Hormone) is secreted from hypothalamus when the level of progesterone and estrogen hormone is low in blood.

103. (c) ACTH stimulates the release of hormones from the adrenal cortex.

104. (b)

105. (c) In the homeostatic control of blood sugar level, hypothalamus and islets of Langerhans of pancreas functions as modulator and effector respectively.

106. (c) ADH is synthesized by hypothalamus.

107. (b) Oxytocin (OT) hormone is produced by hypothalamus under the influence of nervous stimulation. It causes contraction of the smooth muscles of the uterus and myoepithelial cells lining the duct of the mammary gland. Hence it is also called as birth hormone and milk ejection hormone. Prolactin (PRL), secreted from anterior pituitary gland, acts to initiates and maintain milk secretion by the mammary gland, hence it is known as hormone of maternity and milk stimulating hormone. FSH (follicle stimulating hormone), secreted by anterior pituitary gland, is a gonadotrophic hormone. It stimulates spermatogenesis and growth of seminiferous tubules in testes in male and maturation of Graafian follicle and secretion of estrogen and progesterone from corpus luteum in female.

108. (c) Hypothyroidism in adults leads to myxoedema and hyper-parathyroidism in children lead to osteitis fibrosa cystica.

109. (c) Adrenaline hormone is also called as triple F gland for flight, fright and fight reaction which occurs in condition of emergency.

110. (b) PTH (parathyroid hormone), also called Collip's hormone, is secreted from the parathyroid gland. It is responsible for the following functions like: release of calcium by ones into the blood streams, absorption of food by the intestine and conservation of calcium by the kidneys.

111. (d) Iodine is essential for the normal rate of hormone synthesis in the thyroid. Deficiency of iodine in our diet results in hypothyroidism and enlargement of the thyroid gland, commonly called goitre. Hypothyroidism during pregnancy causes defective development and maturation of the growing baby leading to stunted growth (cretinism), mental retardation, low intelligence quotient, abnormal skin, deaf-mutism, etc.

112. (d) Severe hypothyroidism leads to myxoedema. It is also called as Gulls disease which develops in adults and characterized by puffy appearance due to subcutaneous accumulation of fats, low BMR, low heart rate and body temperature, retarded sexuality.

113. (b) HCG (Human Chorionic Gonadotropin) is a placental hormone which maintains the corpus luteum for continuous secretion of progesterone and estrogen so as to maintain pregnancy.

114. (b) Both help in protein synthesis, and are anabolic in nature.

115. (c) Atrial- natriuretic factor (ANF) is a cardiac hormone whose main function is to lower blood pressure and to control electrolyte homeostasis. Its main targets are the kidney and the cardiovascular system but ANF interacts with many other hormones in order to regulate their secretion.

116. (d) ANP stimulates the loss of sodium in the urine and promotes diuresis.

117. (a) Except prostate, all the three glands (thyroid, adrenal and pituitary) are endocrine glands which secretes hormones. Cretinism, goitre and myxoedema are hormonal disorders whereas as scurvy is disease caused due to vitamin C deficiency. Insulin, adrenaline and thyroxine are endocrine hormones secreted from pancreas, adrenal medulla and thyroid gland respectively. Testosterone is a male hormone secreted from Leydig cells of testes whereas the other three (estrogen, progesterone and prolactin) are female hormones secreted from ovary, corpus luteum and anterior pituitary gland respectively.

118. (d) Epinephrine stimulates the heart.

119. (b) All of these hormones are produced in the anterior pituitary gland.

120. (b) Estrogen is secreted by ovary, alpha cells of islets of langerhans secrete glucagon and anterior pituitary secretes growth hormone. The over-secretion of growth hormone leads to gigantism.

121. (d)