Biology · Structure and Function in Living Organisms · Hormonal Coordination in Living Organisms

Glands in Humans (continued)

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Multiple choice questions — 96 questions

1 Hirsutism (excessive hair growth syndrome) in females is the appearance of thick, dark hair in some areas of the body, especially the face and neck. In light of this, which of the following is NOT a possible cause of this condition?

(A) Using medicines that contain androsterone
(B) A defect in the adrenal cortex
(C) A defect in the secretions of the anterior lobe of the pituitary gland
(D) A defect in the nerve cells of the hypothalamus

2 SIADH syndrome happens when too much antidiuretic hormone (ADH) is secreted: Which of the following results from this?

(A) A decrease in the sodium concentration in the blood
(B) An increase in the amount of water in urine
(C) A decrease in urine osmolarity
(D) An increase in blood osmolarity

3 SIADH syndrome happens when too much antidiuretic hormone (ADH) is secreted: Which of the following can be used to treat this condition?

(A) Using ACTH inhibitors
(B) Using ADH inhibitors
(C) Injecting the patient with ADH
(D) Giving the patient tablets that contain adrenaline

4 What is the target organ of aldosterone?

(A) The liver
(B) The adrenal cortex
(C) The kidneys
(D) The adrenal medulla

5 Which of the following affects the secretion of cortisone?

(A) ADH
(B) ACTH
(C) Testosterone
(D) Aldosterone

6 Which of the following results from an increase in the secretion of aldosterone in the blood?

(A) An increase in the concentration of potassium ions in the blood

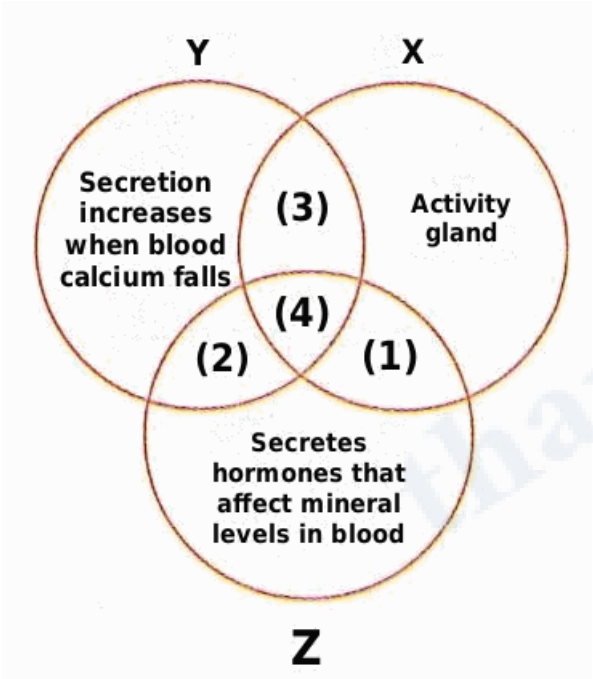
(B) A decrease in the concentration of sodium ions in the blood

(C) A decrease in the concentration of potassium ions in the blood

(D) An increase in the concentration of sodium ions in urine

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7 The following diagram shows the relation between three glands (X), (Y) and (Z). Which choice in the following table represents the numbers (1) to (4)?



(A) (1) Both have a role in muscle contraction, (2) Both affect the calcium level, (3) Stimulated by the anterior lobe of the pituitary gland, (4) The secretion moves through the blood

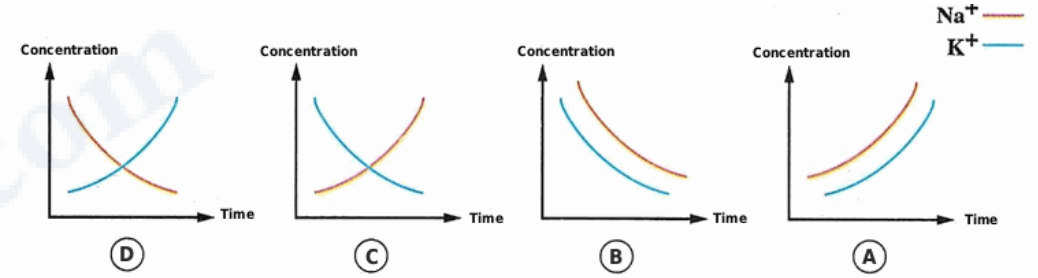
(B) (1) Stimulated by the anterior lobe of the pituitary gland, (2) Both have a role in muscle contraction, (3) Both affect the calcium level, (4) The secretion moves through the blood

(C) (1) Both have a role in muscle contraction, (2) Both affect the calcium level, (3) The secretion moves through the blood, (4) Stimulated by the anterior lobe of the pituitary gland

(D) (1) Both affect the calcium level, (2) Both have a role in muscle contraction, (3) The secretion moves through the blood, (4) Stimulated by the anterior lobe of the pituitary gland

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8 Which of the following graphs shows the effect of a decrease in the aldosterone level in the blood on the concentration of both sodium and potassium in urine?



9 Where are the hormones that affect the nephrons of the kidneys secreted from?

(A) The anterior lobe of the pituitary gland and the adrenal cortex

(B) The adrenal cortex and the nerve cell endings in the posterior lobe of the pituitary gland

(C) The nerve cell endings in the posterior lobe of the pituitary gland and the adrenal medulla

(D) The adrenal medulla and the anterior lobe of the pituitary gland

10 Which hormone do you expect its level in the blood to rise after eating a meal of salted fish?

(A) Glucagon (B) Aldosterone (C) ADH (D) Cortisone

11 The hormones that affect carbohydrate metabolism are secreted under the effect of the hormone .....

(A) ADH (B) FSH (C) LH (D) ACTH

12 Which of the following hormones affect the concentration of urine in a healthy person?

(A) Aldosterone and ADH (B) Glucagon and insulin

(C) Calcitonin and parathormone (D) Oxytocin and thyroxine

13 Which of the following hormones is secreted at the same time as the increased activity of players in sports fields?

(A) Gastrin (B) Adrenaline (C) Testosterone (D) Calcitonin

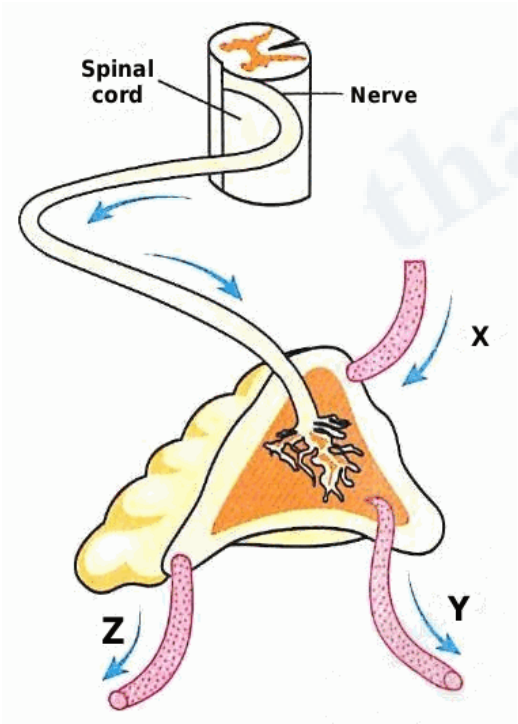
14 Which of the following can be noticed in a blood test when the adrenal cortex is damaged or atrophied?

(A) A rise in sodium and a fall in potassium
(B) A fall in sodium and a rise in potassium
(C) A rise in both sodium and potassium
(D) A fall in both sodium and potassium

15 Which of the following statements describes the relation between ACTH and cortisone?

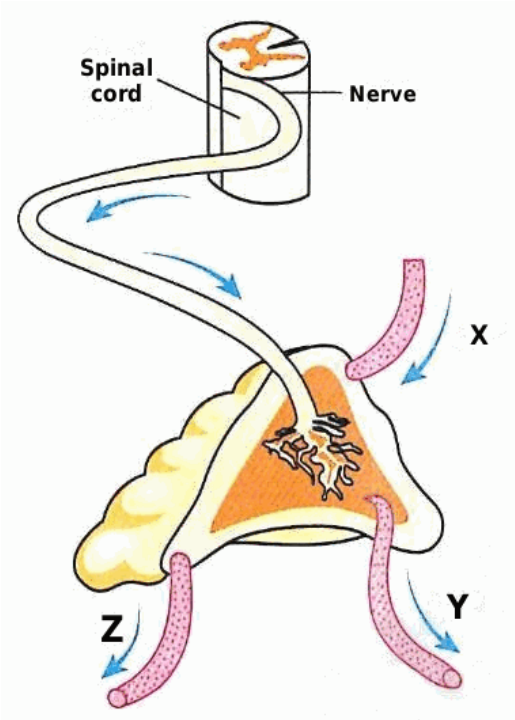
(A) Cortisone secretion decreases as ACTH secretion increases
(B) Cortisone secretion increases as ACTH secretion decreases
(C) Cortisone secretion increases as ACTH secretion increases
(D) ACTH secretion decreases as cortisone secretion decreases

16 From the opposite figure, which shows the nervous connection to the adrenal gland:
What are the hormones (X), (Y) and (Z) respectively?



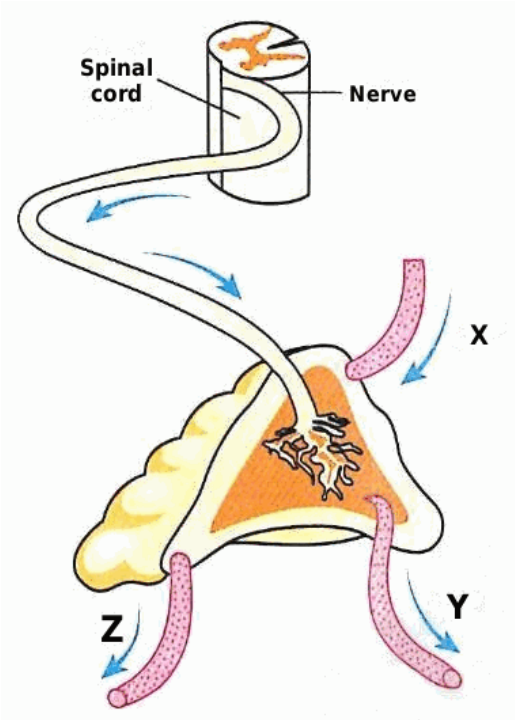
(A) ACTH / aldosterone / adrenaline
(B) Adrenaline / ACTH / aldosterone
(C) ACTH / adrenaline / aldosterone
(D) Aldosterone / adrenaline / ACTH

17 From the opposite figure, which shows the nervous connection to the adrenal gland:
Which hormones are secreted faster?



(A) (X) only (B) (Z) and (Y) (C) (Y) only (D) (X) and (Z)

18 From the opposite figure, which shows the nervous connection to the adrenal gland:
Which of the following results from the nervous stimulation shown in the figure?



(A) Direct control of energy production by the gland

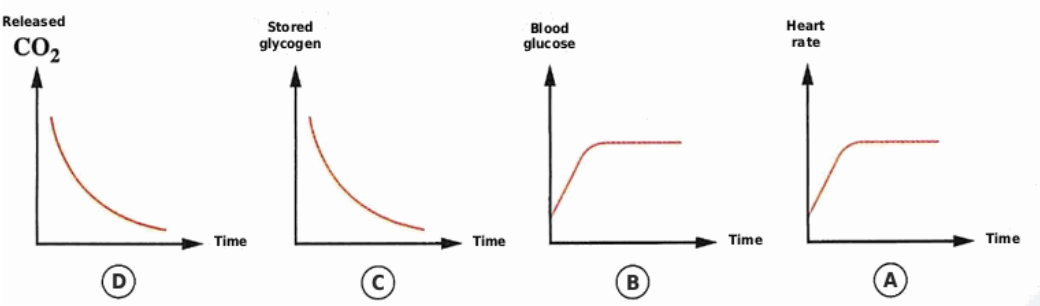
(B) A fast response of the gland cells by secreting a hormone that raises blood pressure

(C) A longer response of the gland cells by secreting a hormone that controls puberty

(D) Inhibition of the response of the outer part of the gland

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19 Which of the following graphs is NOT correct when the activity of the adrenal medulla increases?



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20 Which of the following hormones has a role in the response of a muscle to the nerve impulse?

(A) Aldosterone

(B) Calcitonin

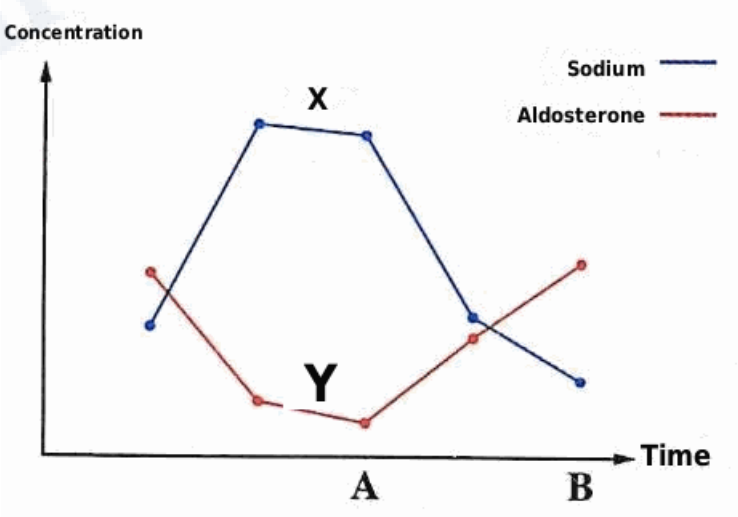
(C) Parathormone and secretin

(D) Aldosterone and cortisone

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21 The opposite graph shows the rate of sodium excretion in urine (X) and the level of aldosterone in the blood (Y).

Which of the following statements agrees with what the two curves show?



(A) Meals rich in table salt are accompanied by a rise in the aldosterone level

(B) The fall of sodium in urine is explained by a rise in the aldosterone level

(C) There is no relation between more table salt in meals and the aldosterone level

(D) The period from (A) to (B) will be accompanied by a fall in the potassium level in urine

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22 Which hormone affects the concentration of urine indirectly?

(A) ACTH (B) ADH (C) TSH (D) GH

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23 At the end of a marathon, a runner's body becomes dehydrated. Which parts of the pituitary gland and the adrenal gland respectively are directly responsible for restoring the osmotic balance?

(A) The anterior lobe / the cortex

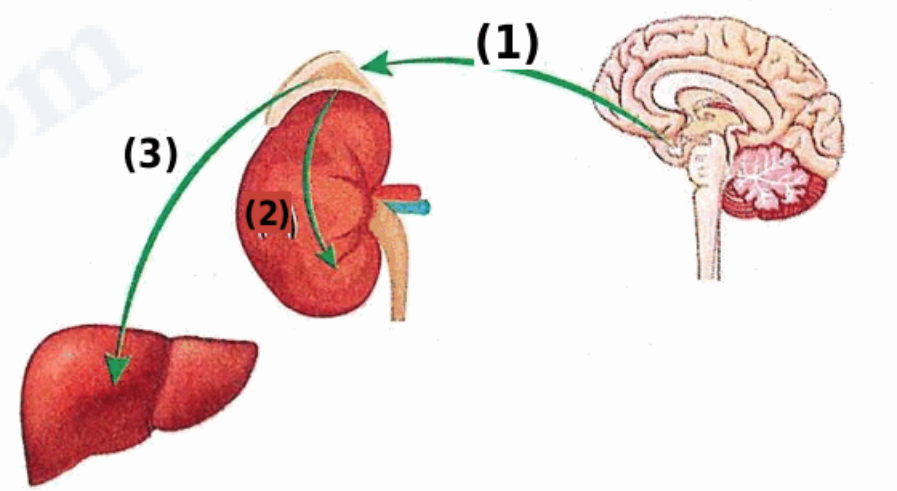
(B) The anterior lobe / the medulla

(C) The nervous part / the cortex

(D) The nervous part / the medulla

---

24 Which of the following represents the hormones (1), (2) and (3) shown in the figure in front of you?



(A) (1) ACTH, (2) aldosterone, (3) adrenaline
(B) (1) ADH, (2) aldosterone, (3) cortisone
(C) (1) ADH, (2) cortisone, (3) aldosterone
(D) (1) ACTH, (2) sex hormones, (3) adrenaline

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25 What happens when you eat meals that are very poor in table salt?

(A) The aldosterone level in the blood rises
(B) The aldosterone level in the blood falls
(C) The sodium level in urine rises
(D) The potassium level in urine falls

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26 A researcher removed a large part of the outer layer of the adrenal gland of a laboratory animal. What is the result of this?

(A) Less ACTH is secreted
(B) Less aldosterone is secreted
(C) Less adrenaline is secreted
(D) More cortisone is secreted

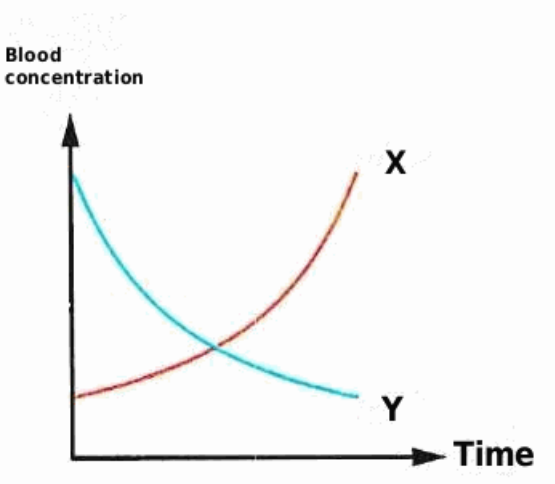
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27 Which of the following hormones does NOT directly affect the amount of glycogen in the liver?

(A) Insulin
(B) Glucagon
(C) Thyroxine
(D) Adrenaline

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28 The opposite graph shows the concentration of two substances in the blood (X) and (Y). Which of the following is NOT correct?



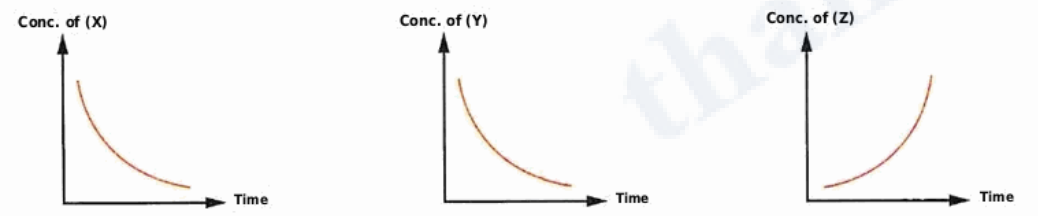
(A) (X) insulin, (Y) glucose

(B) (X) aldosterone, (Y) sodium

(C) (X) calcitonin, (Y) calcium

(D) (X) aldosterone, (Y) potassium

29 From the previous graphs, which of the following is correct?



(A) If (X) is iodine, then (Z) is thyroxine

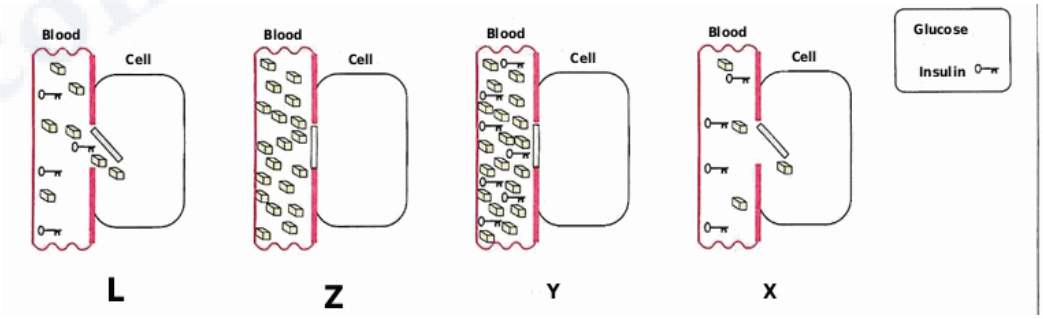
(B) If (X) is insulin, then (Y) is glucagon

(C) If (X) is insulin, then (Z) is the blood glucose level

(D) If (Y) is glucagon, then (X) is the level of glycogen stored in the liver

30 Diabetes mellitus is of two types: in the first, a defect in the beta cells decreases or stops insulin secretion; in the second, the beta cells produce insulin but the body cannot use it. In light of this, answer:

Which of the following represents type one and type two diabetes respectively?



(A) (X) / (Y) (B) (Y) / (L) (C) (Z) / (Y) (D) (L) / (X)

---

31 If hormone (X) affects all body cells, hormone (Y) is produced by nerve cells and hormone (Z) affects the gonads, what are the hormones (X), (Y) and (Z) respectively?

(A) Insulin / parathormone / FSH
(B) Thyroxine / oxytocin / LH
(C) ADH / ACTH / prolactin
(D) Calcitonin / adrenaline / testosterone

---

32 A defect in the function of which of the following leads to a defect in the metabolism of both glucose and fats in the body?

(A) The adrenal medulla
(B) The posterior lobe of the pituitary gland
(C) The pancreas
(D) The parathyroid glands

---

33 If you spent the whole day studying and skipped breakfast and lunch, which of the following hormones is expected to rise in your blood?

(A) Glucagon (B) Growth hormone (C) Insulin (D) Calcitonin

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34 Which choice in the following table is correct for glucagon?

(A) Secreting cells: alpha cells of the islets of Langerhans, target cells: the liver
(B) Secreting cells: alpha cells of the islets of Langerhans, target cells: the liver and muscles
(C) Secreting cells: beta cells of the islets of Langerhans, target cells: the liver
(D) Secreting cells: beta cells of the islets of Langerhans, target cells: the liver and muscles

35 Insulin transports glucose .....

(A) into the cells (B) out of the cells (C) into the blood (D) into urine

36 What is the correct sequence that shows how the blood glucose level is controlled?

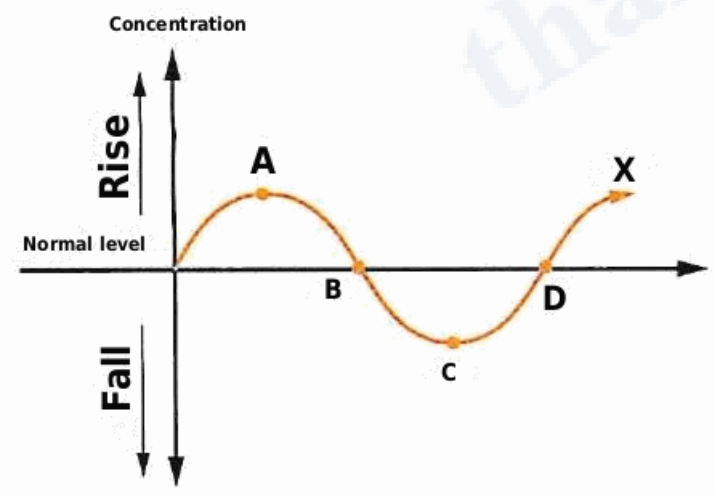
(A) Increase in blood glucose / more glucagon secreted / glycogen converted into glucose / decrease in blood glucose

(B) Decrease in blood glucose / less glucagon secreted / glycogen converted into glucose / increase in blood glucose

(C) Increase in blood glucose / more insulin secreted / glucose converted into glycogen / decrease in blood glucose

(D) Decrease in blood glucose / less insulin secreted / glucose converted into glycogen / increase in blood glucose

37 The following curve shows some possible changes in the blood glucose level. Which choice in the opposite table shows the hormones secreted to change the level from (A) to (B), from (C) to (D) and from (D) to (X) respectively?

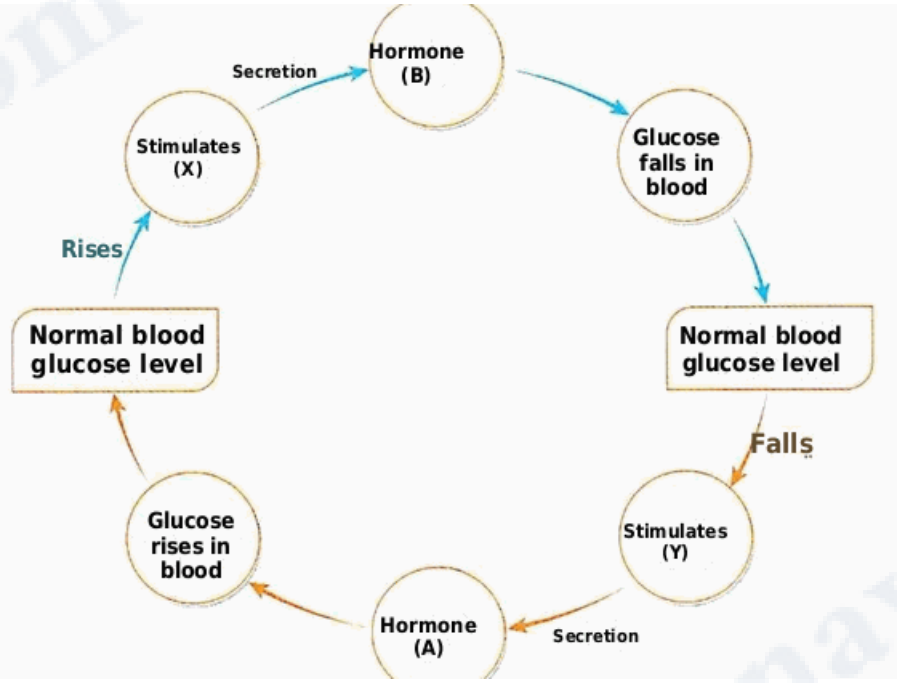


(A) Insulin / adrenaline / glucagon (B) Insulin / glucagon / adrenaline

(C) Glucagon / insulin / adrenaline (D) Glucagon / adrenaline / insulin

38 The opposite diagram shows the role of two hormones that affect the blood glucose level. Study it, then answer:

What does the letter (X) represent?



(A) The follicular cells of the thyroid gland

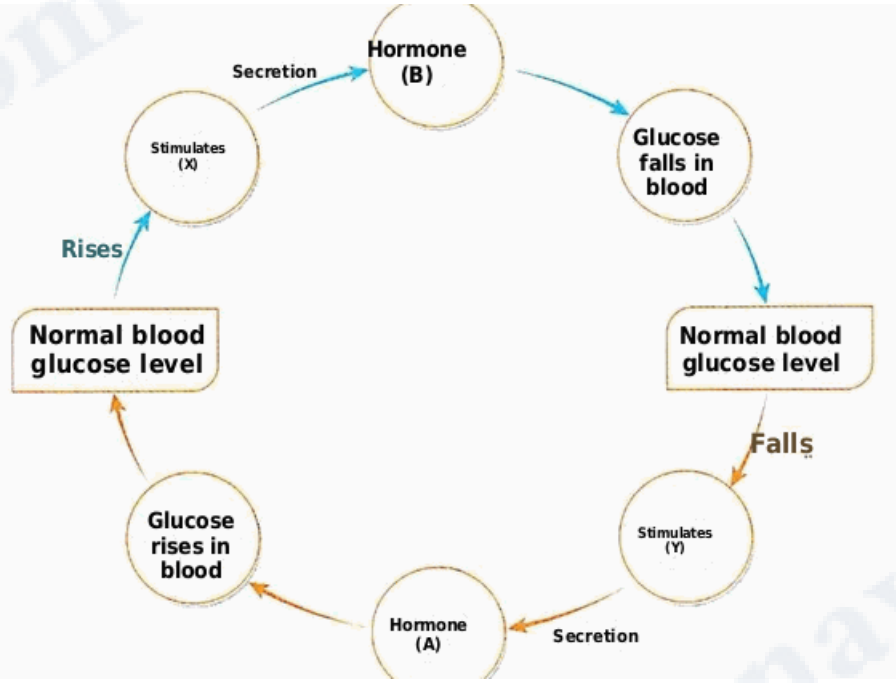
(B) Alpha cells of the pancreas

(C) Beta cells of the pancreas

(D) The glands of the duodenum lining

39 The opposite diagram shows the role of two hormones that affect the blood glucose level. Study it, then answer:

Which of the following represents the hormones (A) and (B) respectively?



(A) Insulin / thyroxine
(B) Glucagon / insulin
(C) Insulin / glucagon
(D) Adrenaline / thyroxine

40 The formation of which of the following substances in the human body is affected by insulin?

(A) Proteins only
(B) Proteins and fats
(C) Carbohydrates only
(D) Carbohydrates and fats

41 Which of the following happens when the beta cells release insulin into the blood?

(A) Skeletal muscles get glucose at a faster rate
(B) The kidneys start excreting glucose in urine
(C) Alpha cells release glucagon into the blood
(D) The glycogen stored in the liver is broken down

42 A researcher did an experiment on two laboratory mice (X) and (Y) for two hours without any food. He tied the pancreatic duct of mouse (Y) and left mouse (X) without any surgery. What do you expect to happen after a few hours?

(A) Glucose rises above normal in the blood of mouse (X)

(B) Glucose rises above normal in the blood of mouse (Y)

(C) Glucose falls below normal in the blood of both mice (X) and (Y)

(D) Glucose is not affected in either mouse (X) or (Y)

---

43 Which hormone is secreted fastest after drinking a glass of juice?

(A) Glucagon (B) Cortisone (C) Insulin (D) Aldosterone

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44 What happens when a mouse is continuously injected with insulin?

(A) The blood glucose concentration increases

(B) Liver glycogen is converted into glucose

(C) Fat storage in the body increases

(D) The permeability of cell membranes to glucose decreases

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45 In the following table, which choice is correct about diabetes mellitus?

(A) Glucose in urine: increase, in blood: increase

(B) Glucose in urine: decrease, in blood: increase

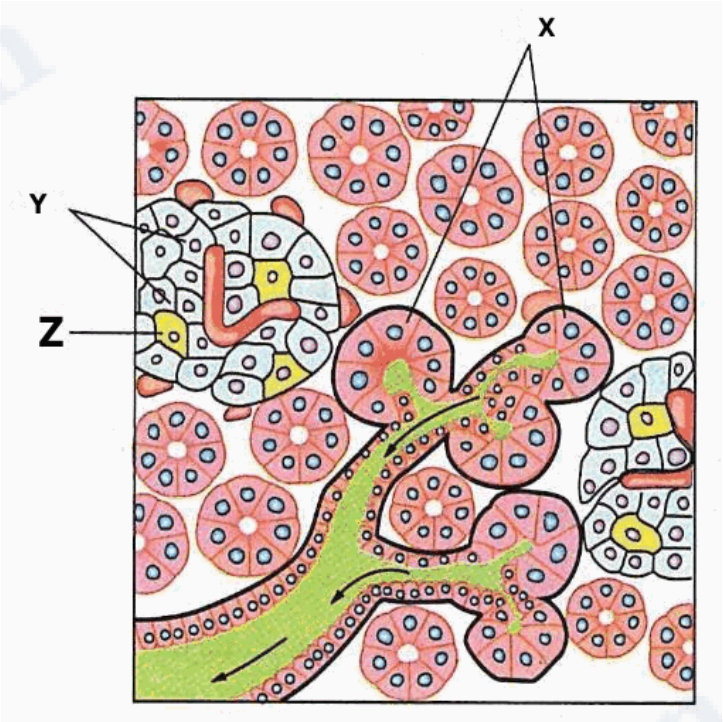
(C) Glucose in urine: increase, in blood: decrease

(D) Glucose in urine: decrease, in blood: decrease

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46 The opposite figure shows a section in the pancreas:

What activates the cells (X)?



(A) Insulin and glucagon

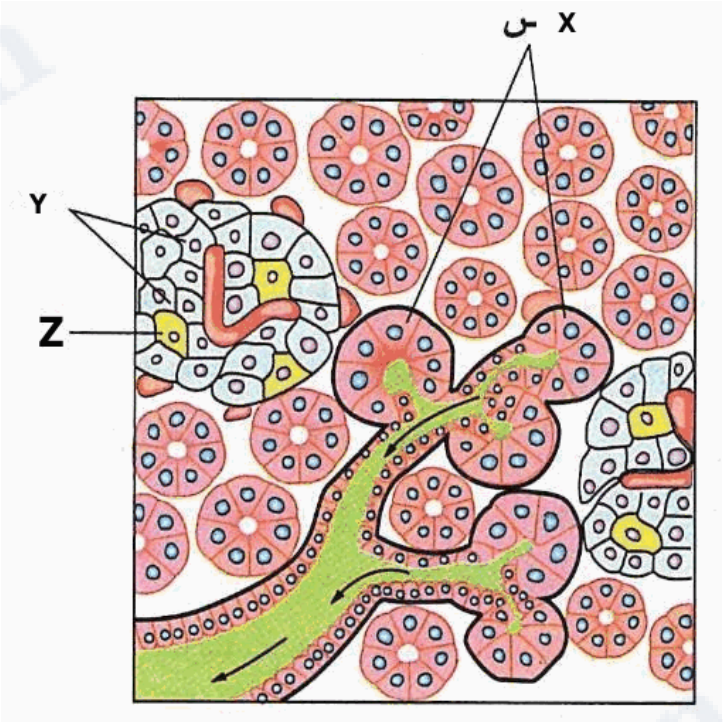
(B) Secretin and gastrin

(C) Duodenum hormones and the nerve impulse

(D) The nerve impulse and gastrin

47 The opposite figure shows a section in the pancreas:

What does the work of both (Y) and (Z) depend on?



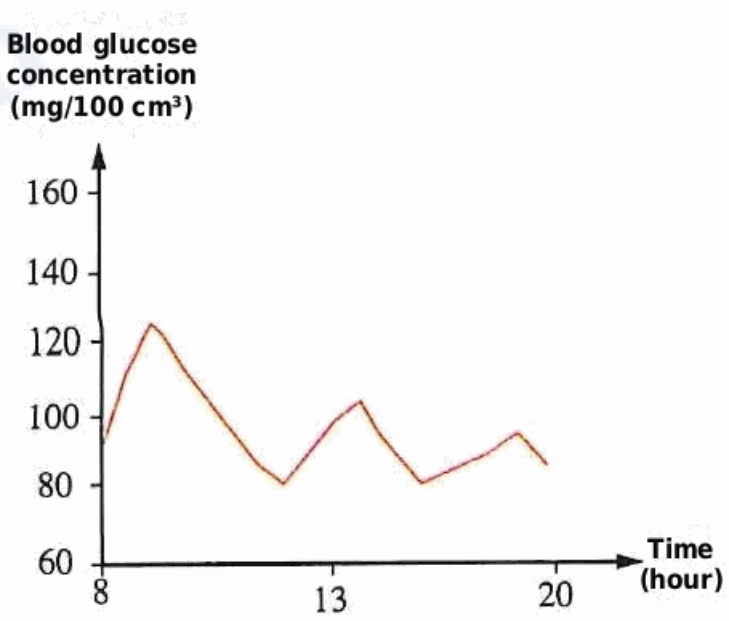
(A) Stimulation by pituitary hormones

(B) The blood glucose concentration

(C) The amount of glycogen in the liver

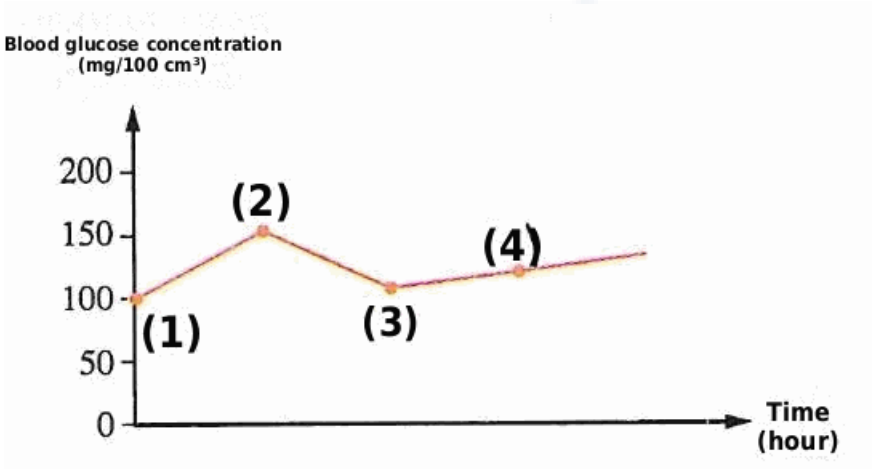
(D) More oxidation of glucose in the cells

48 The opposite graph shows the blood glucose concentration of a person during several hours of the day. What do you conclude about this person's condition?



(A) Healthy
(B) Has diabetes mellitus
(C) Has a defect in fat metabolism
(D) Has dehydration

49 From the opposite graph, at which point does insulin reach its highest level?



(A) (1)
(B) (2)
(C) (3)
(D) (4)

50 Which of the following statements is correct?

(A) The movement of glucose from the small intestine into the blood inhibits the activity of alpha cells

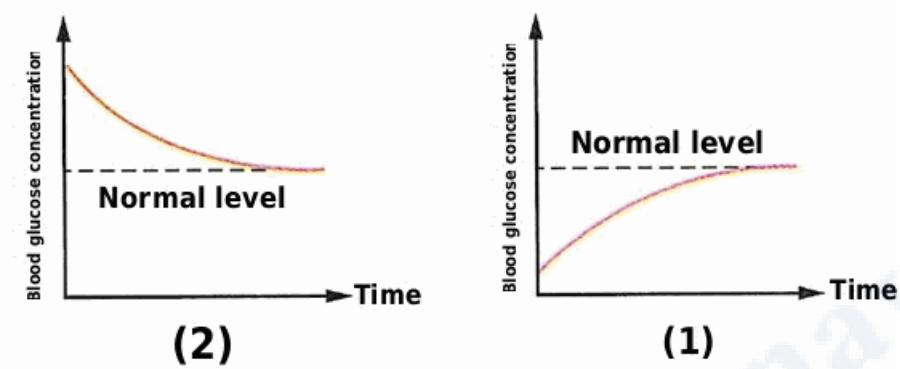
(B) Insulin secretion increases when a person does not eat for several hours

(C) A rise in glucagon stimulates glucose to pass into muscle cells

(D) A rise in insulin stimulates the release of glucose from the liver

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51 From the two opposite graphs, which of the following statements is correct?



(A) The glycogen level increases in (1)

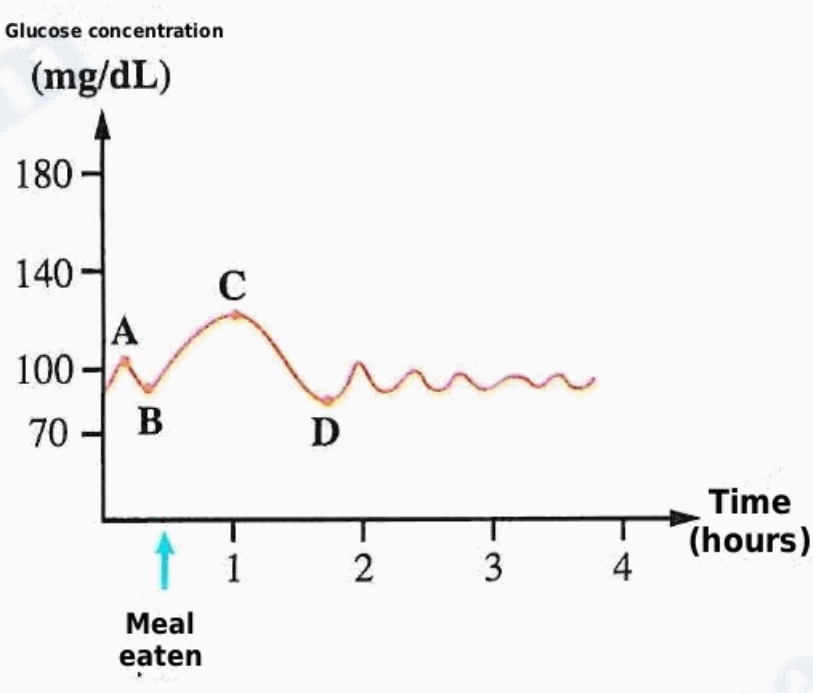
(B) The glycogen level decreases in (2)

(C) The glycogen level decreases in (1)

(D) Glycogen is not affected in either (1) or (2)

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52 The opposite graph shows the blood glucose level after eating a meal, for four hours. Which of the following statements is correct?



(A) The glucose concentration at point (C) is a symptom of diabetes mellitus

(B) The glucose level rises from (B) to (C) because glucagon is secreted

(C) The glucose level falls from (C) to (D) because insulin is secreted

(D) The glucose level falls from (A) to (B) because adrenaline is secreted

53 Based on the data in the opposite table, which shows the blood glucose concentration of a person over seven hours in a row, what is the reason for the rise of blood glucose at 8 a.m. and at 1 p.m.?

Time	Blood glucose concentration (mg/100 cm^3)
6 a.m.	76
7 a.m.	77
8 a.m.	124
9 a.m.	91
10 a.m.	83
11 a.m.	81
12 p.m.	79
1 p.m.	130

(A) More physical activity

(B) A defect in the beta cells of the pancreas

(C) A defect in the alpha cells of the pancreas

(D) Eating a balanced meal

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54 The following table shows the glucose concentration and the amount of glycogen of four people before and after eating the same meal rich in carbohydrates (the values before the meal, then two hours later). Which of them is a normal person without diabetes?

(A) Blood glucose (mg/100 cm^3): 80 then 180, liver glycogen (mg): 150 then 200

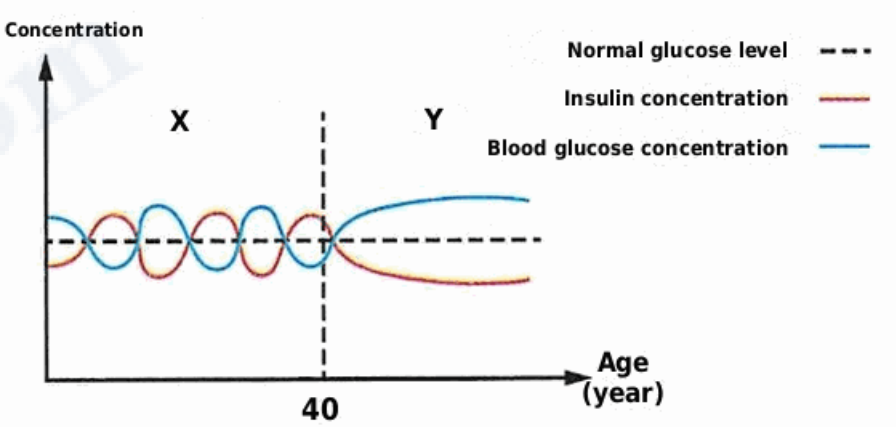
(B) Blood glucose (mg/100 cm^3): 75 then 115, liver glycogen (mg): 120 then 120

(C) Blood glucose (mg/100 cm^3): 85 then 230, liver glycogen (mg): 80 then 85

(D) Blood glucose (mg/100 cm^3): 80 then 120, liver glycogen (mg): 160 then 210

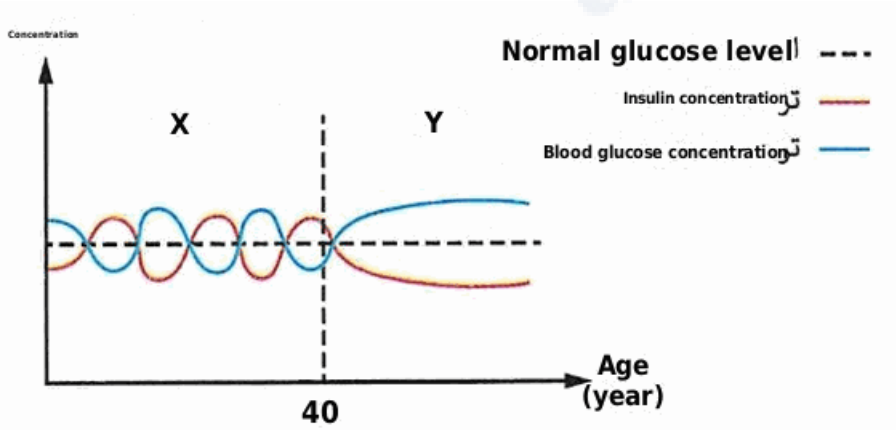
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55 According to the information shown in the opposite graph:
Which of the following statements is correct?



(A) In stage (X) insulin secretion is normal
(B) In stage (Y) insulin secretion is normal
(C) In both stages (X) and (Y) insulin secretion is normal
(D) Insulin is not secreted normally in either stage (X) or (Y)

56 According to the information shown in the opposite graph:
What is the condition of the person whose information is shown in the graph?



(A) Healthy during both stages (X) and (Y)
(B) Has had diabetes mellitus since childhood
(C) Healthy in stage (X) and has diabetes mellitus in stage (Y)
(D) Healthy in stage (Y) and has diabetes mellitus in stage (X)

57 Which of the following hormones affect all body cells, including the cells that secrete them?

(A) Thyroxine and insulin
(B) Parathormone and calcitonin
(C) ADH and aldosterone
(D) Gastrin and adrenaline

58 Which of the following hormones does NOT increase in secretion during exercise?

(A) Glucagon (B) Thyroxine (C) Adrenaline (D) Calcitonin

59 Which of the following is a difference between the ductless secretions of the adrenal cortex and the ovary in the human female?

(A) The type of stimulus
(B) The nature of the secretions
(C) The means of transport
(D) The target organs

60 Which of the following hormones is NOT secreted by temporary glands in the body?

(A) Estrogen (B) Progesterone (C) Relaxin (D) Oxytocin

61 Which of the following hormones does NOT affect the cells of the mammary glands?

(A) Insulin (B) Prolactin (C) Oxytocin (D) Calcitonin

62 Which of the following happens to a woman at the end of the ninth month of pregnancy who has low blood pressure?

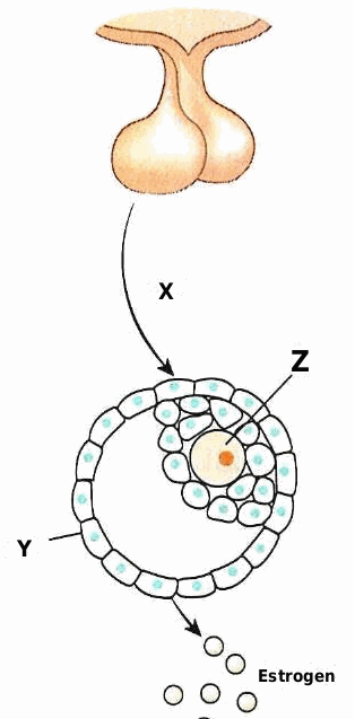
(A) More ADH and less relaxin are secreted
(B) Less ADH and more relaxin are secreted
(C) Less of both ADH and relaxin is secreted
(D) More of both ADH and relaxin is secreted

63 The ovaries were removed from an immature female mouse. What do you expect to happen when this female is injected with balanced concentrations of estrogen?

(A) Progesterone increases in the blood
(B) More FSH is secreted into the blood
(C) Ovulation happens
(D) Secondary sexual characteristics appear

64 In the opposite figure:

What do (Y) and (Z) represent respectively?



(A) Two endocrine glands

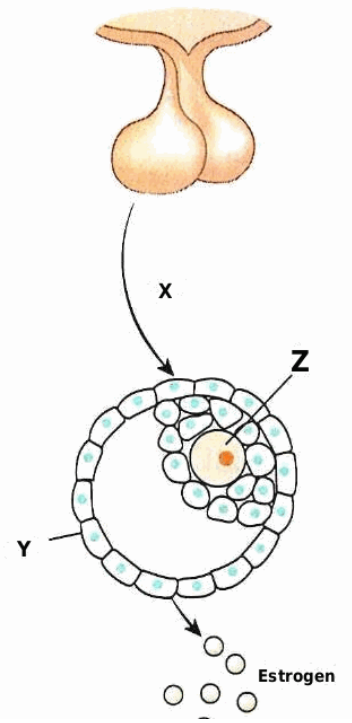
(B) An endocrine gland / an exocrine (duct) gland

(C) An endocrine gland / a sex cell

(D) Two somatic cells

65 In the opposite figure:

If (X) stimulates the growth of (Y), which of the following represents (X) and (Y) respectively?



(A) LH / corpus luteum
(B) FSH / Graafian follicle
(C) Prolactin / mammary gland
(D) ADH / a cell of a kidney nephron

66 Which of the following structures, when it secretes more hormones, increases muscle strength at puberty?

(A) The thyroid gland
(B) The adrenal medulla
(C) The interstitial cells of the testis
(D) The seminiferous tubules of the testis

67 In which choice does the work of one hormone complete the work of the other?

(A) Glucagon and insulin in both sexes
(B) FSH and LH in the male
(C) FSH and LH in the female
(D) Testosterone and androsterone in the male

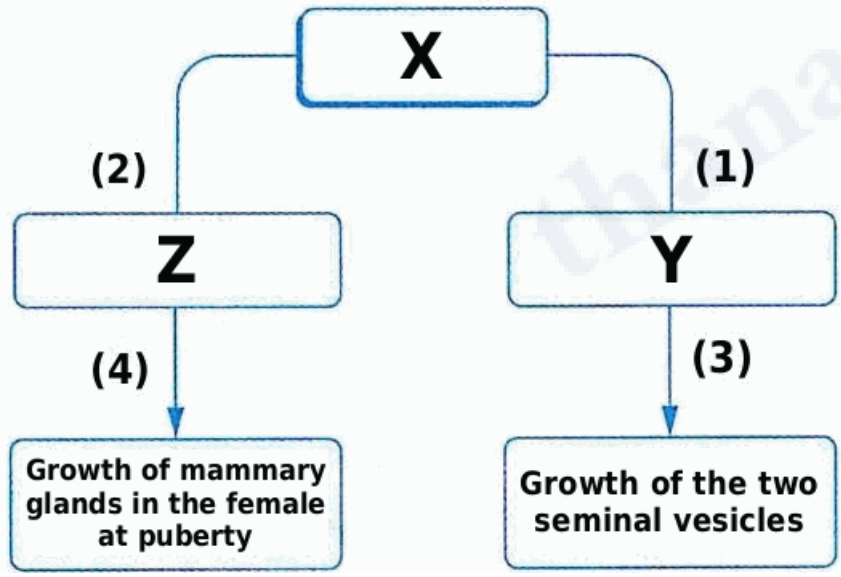
68 If (X) is a hormone made of fatty substances, (Y) is a hormone responsible for the growth of an endocrine gland in the female only, and (Z) is a hormone responsible for forming the glandular tissue that secretes hormone (X), what are the hormones (X), (Y) and (Z) respectively?

(A) Testosterone / LH / FSH
(B) Testosterone / FSH / LH
(C) FSH / LH / testosterone
(D) LH / FSH / testosterone

69 Which of the following is directly responsible for maintaining the uterus lining during pregnancy?

(A) Prolactin (B) Progesterone (C) FSH (D) LH

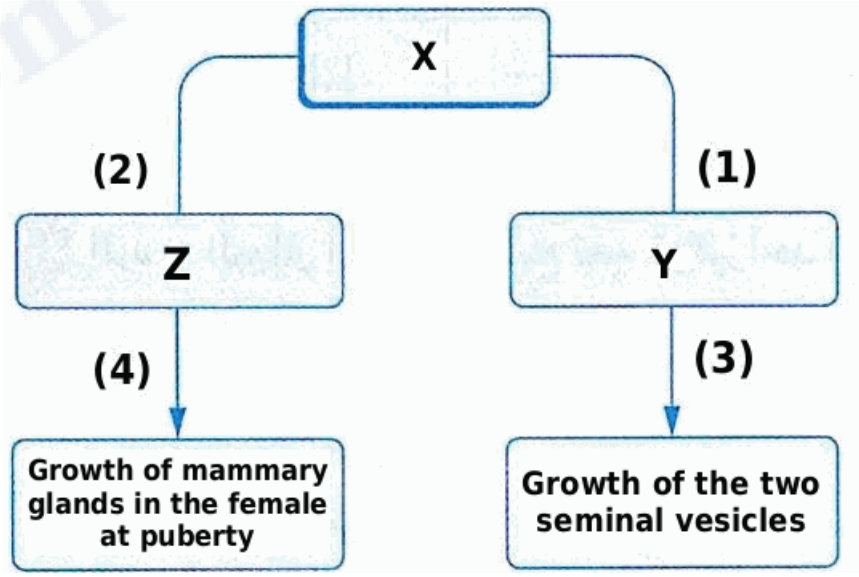
70 In the opposite diagram, (X), (Y) and (Z) are three endocrine glands and the numbers (1) to (4) are hormones. Study it, then answer:
What do the glands (X), (Y) and (Z) represent respectively?



(A) The anterior lobe of the pituitary gland / Graafian follicle / the interstitial cells of the testis
(B) The anterior lobe of the pituitary gland / the interstitial cells of the testis / corpus luteum
(C) The anterior lobe of the pituitary gland / the interstitial cells of the testis / Graafian follicle
(D) Corpus luteum / the anterior lobe of the pituitary gland / Graafian follicle

71 In the opposite diagram, (X), (Y) and (Z) are three endocrine glands and the numbers (1) to (4) are hormones. Study it, then answer:

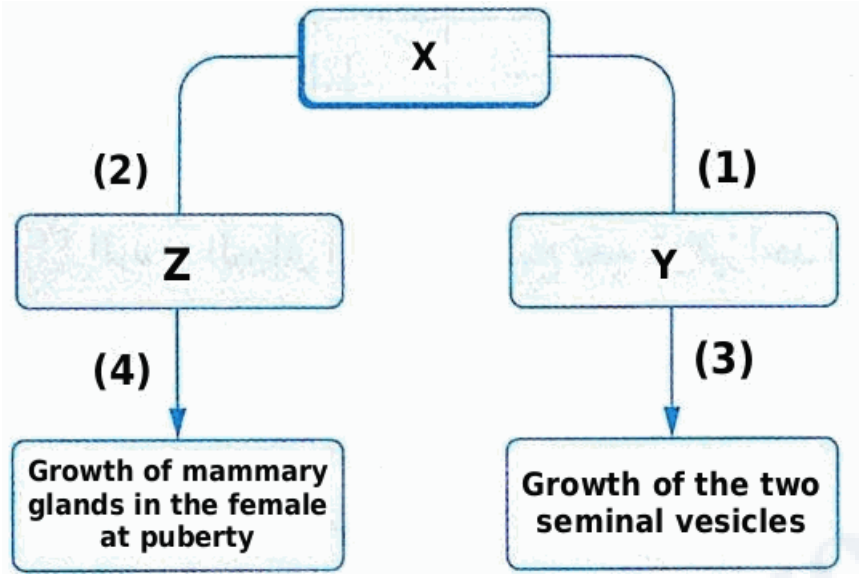
What are the hormones (1) and (3) respectively?



(A) LH / follicle stimulating hormone
(B) LH / androsterone
(C) FSH / testosterone
(D) Follicle stimulating hormone / LH

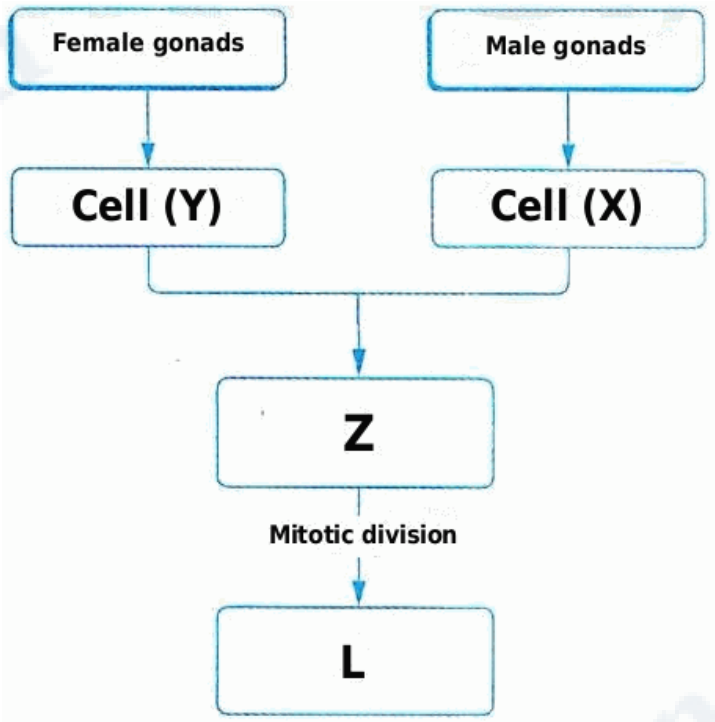
72 In the opposite diagram, (X), (Y) and (Z) are three endocrine glands and the numbers (1) to (4) are hormones. Study it, then answer:

What are the hormones (2) and (4) respectively?



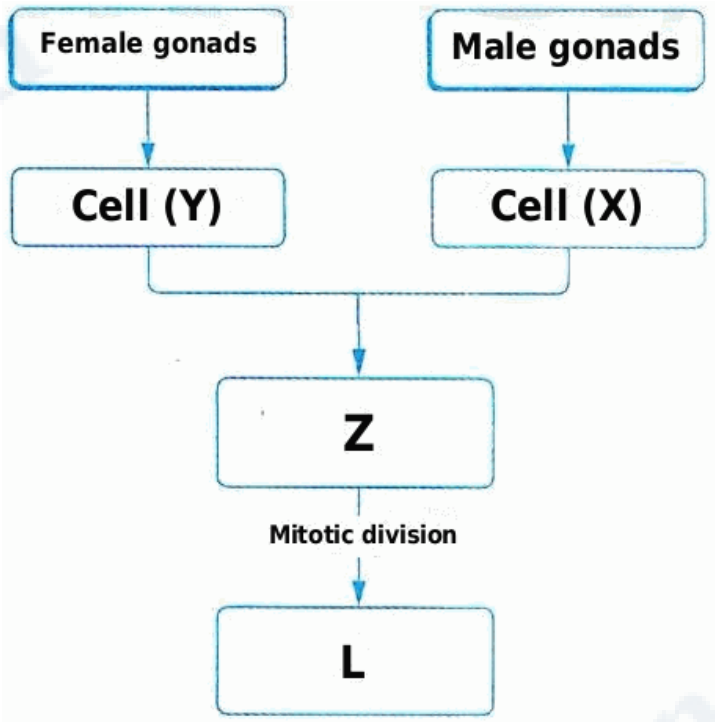
(A) Estrogen / LH
(B) FSH / estradiol
(C) Estradiol / FSH
(D) LH / estrogen

73 The opposite diagram shows one of the vital processes in humans. Study it, then answer:
Where is the hormone responsible for forming cell (X) secreted from?



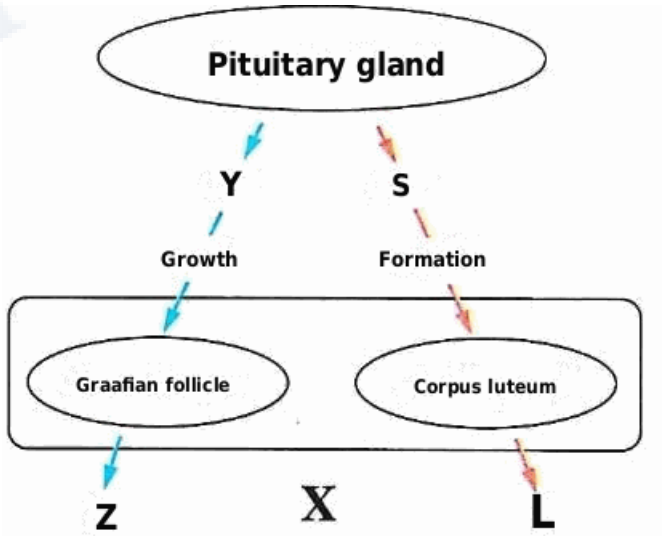
(A) The tubules of the testis
(B) The adrenal cortex
(C) The nervous part of the pituitary gland
(D) The anterior lobe of the pituitary gland

74 The opposite diagram shows one of the vital processes in humans. Study it, then answer:
Which hormone is responsible for maintaining (L)?



(A) Prolactin (B) Progesterone (C) Oxytocin (D) Relaxin

75 From the diagram that shows the effect of the pituitary gland secretions on one of the organs (X) in the body of the human female, which of the following can represent the hormones (S), (Y), (Z) and (L)?



(A) (S) FSH, (Y) estrogen, (Z) LH, (L) progesterone

(B) (S) LH, (Y) FSH, (Z) estrogen, (L) progesterone

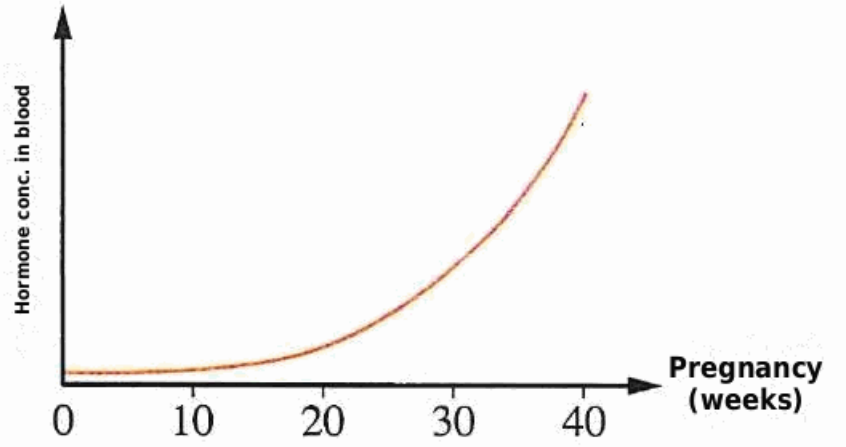
(C) (S) FSH, (Y) progesterone, (Z) estrogen, (L) LH

(D) (S) LH, (Y) estrogen, (Z) progesterone, (L) FSH

---

76 The opposite graph shows the change in the concentration of a hormone secreted during pregnancy:

Which hormone does the curve represent?

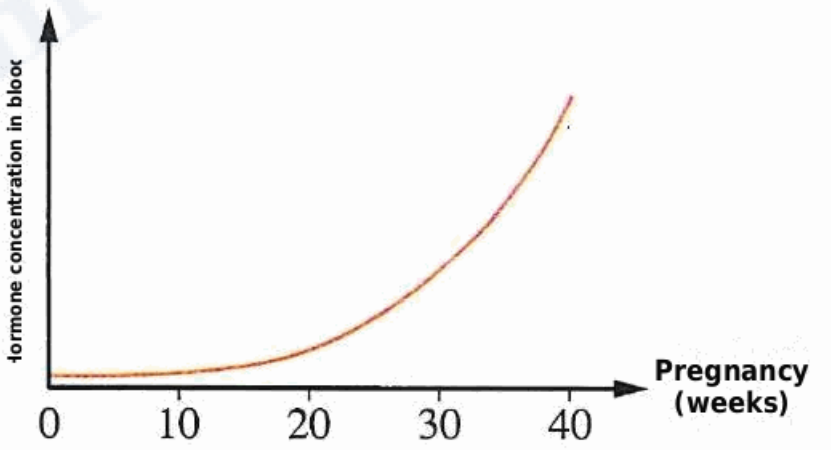


(A) Estrogen (B) Oxytocin (C) Prolactin (D) FSH

---

77 The opposite graph shows the change in the concentration of a hormone secreted during pregnancy:

Where is this hormone secreted from?



(A) The glandular part of the pituitary gland

(B) The Graafian follicle

(C) The nervous part of the pituitary gland

(D) The corpus luteum

---

78 A researcher noticed that girls in North America mature faster than girls of the same age in other regions. Looking for the causes, he found that the shampoo used by girls in North America contains hormones that cause early puberty. Which hormone do you expect to be in the shampoo?

(A) Prolactin (B) LH (C) Estrogen (D) Progesterone

---

79 In an experiment on two groups of rabbits, a researcher added a kind of basil plant called Tulsi to the food of the first group (X), while the second group (Y) ate only the usual daily food. Thirty days after the start of the experiment, the researcher measured the FSH level in the blood and recorded the results in the table:

FSH level in the blood: group (X) 0.13 units, group (Y) 0.64 units.

Based on the results of the experiment, which of the following is correct for the males of the two groups?

(A) Males of group (X) produce more sperms than group (Y)

(B) Males of group (X) produce fewer sperms than group (Y)

(C) Males of groups (X) and (Y) produce the same number of sperms

(D) Males of group (Y) produce more sperms than group (X), but they are not fully mature

80 In an experiment on two groups of rabbits, a researcher added a kind of basil plant called Tulsi to the food of the first group (X), while the second group (Y) ate only the usual daily food. Thirty days after the start of the experiment, the researcher measured the FSH level in the blood and recorded the results in the table:

FSH level in the blood: group (X) 0.13 units, group (Y) 0.64 units.

Based on the results of the experiment, which of the following is correct for the females of the two groups?

(A) The estrogen level in the blood of the females of group (X) is higher than group (Y)

(B) The estrogen level in the blood of the females of group (X) is lower than group (Y)

(C) The progesterone level in the blood of the females of group (X) is higher than group (Y)

(D) The progesterone level in the blood of the females of group (X) is equal to its level in group (Y)

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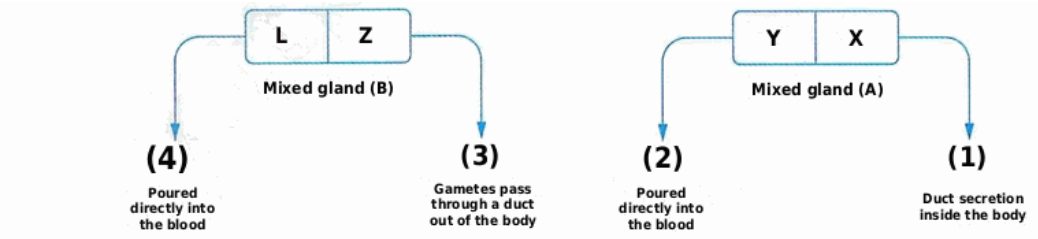
81 Which hormone plays an indirect role in the growth of the comb in roosters?

(A) GH (B) LH (C) TSH (D) ADH

---

82 The following figure is a diagram of two mixed glands of the same person. The numbers (1) to (4) refer to a group of secretions. Answer:

What is the sex of this person, and when does gland (B) work?



(A) Female – before puberty

(B) Male – before puberty

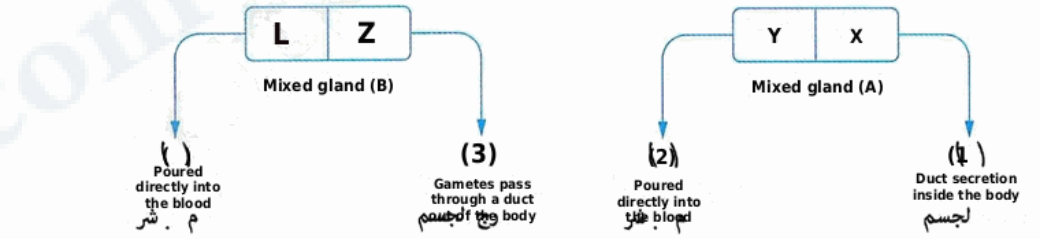
(C) Female – after puberty

(D) Male – after puberty

---

83 The following figure is a diagram of two mixed glands of the same person. The numbers (1) to (4) refer to a group of secretions. Answer:

What can the secretions (2) and (4) represent respectively?



(A) Ova / gastrin

(B) Glucagon / gastrin

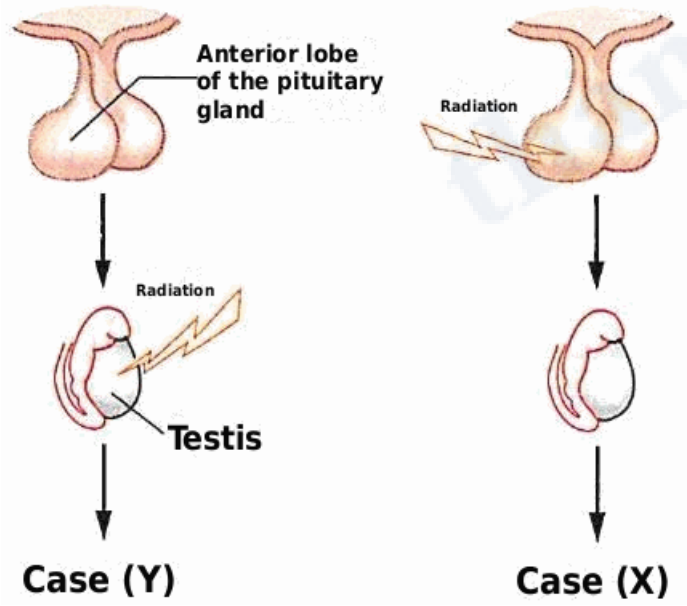
(C) Insulin / testosterone

(D) Insulin / sperms

---

84 The opposite figure shows two different cases of partial failure caused by exposing two different glands in the body of an adult male to radiation:

What is the effect of this failure on testosterone secretion in cases (X) and (Y) respectively?



(A) Increases / decreases

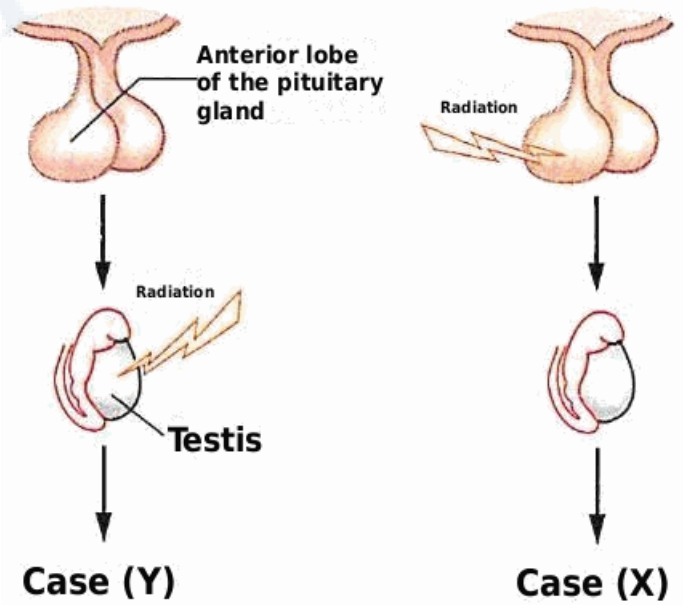
(B) Not affected / not affected

(C) Decreases / increases

(D) Decreases / decreases

---

85 The opposite figure shows two different cases of partial failure caused by exposing two different glands in the body of an adult male to radiation:
What is the result of a complete failure in case (Y)?



(A) An increase in the duct (exocrine) secretion
(B) An increase in the ductless (endocrine) secretion
(C) Sterility
(D) An increase in the number of sperms

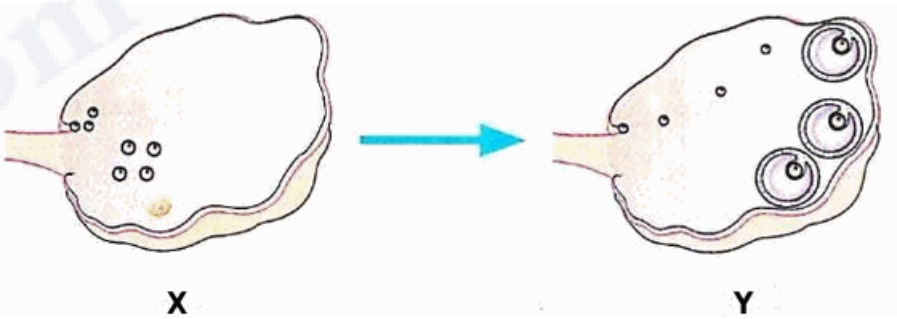
86 A defect in which of the following structures delays the growth of the breasts in a female at puberty?

(A) The uterus lining
(B) The adrenal medulla
(C) The anterior lobe of the pituitary gland
(D) The posterior lobe of the pituitary gland

87 Which of the following hormones does NOT contribute to the appearance of the beard in an adult human male?

(A) LH (B) FSH (C) Testosterone (D) Androsterone

88 The opposite figure shows an uncommon condition that happens in the ovary of a human female. Excessive secretion of which of the following causes the ovary to change from (X) to (Y)?



(A) The nervous part of the pituitary gland

(B) The adrenal cortex

(C) The glandular part of the pituitary gland

(D) The adrenal medulla

---

89 Which of the following organs does NOT contain endocrine gland cells?

(A) The testis

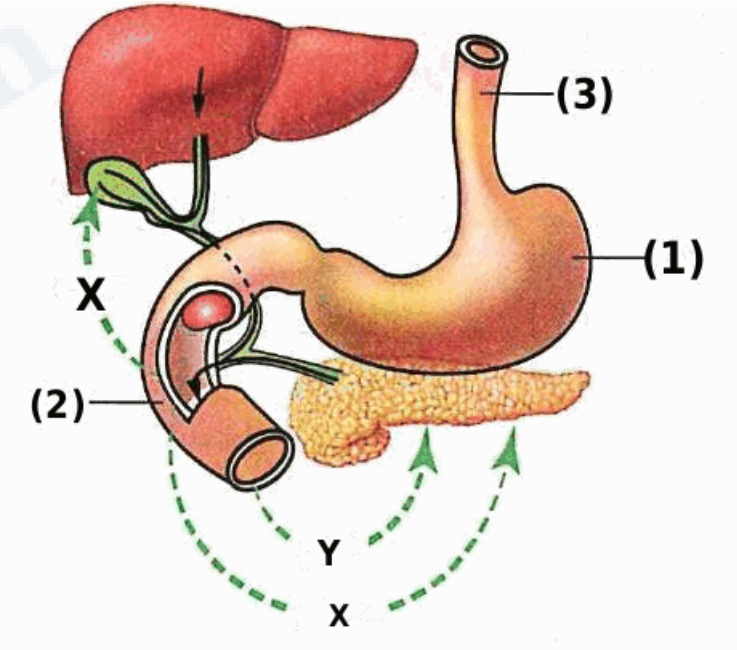
(B) The pancreas

(C) The stomach lining

(D) The esophagus lining

---

90 Study the opposite figure, which shows some parts of the digestive system, then answer:
Which of the following is correct?



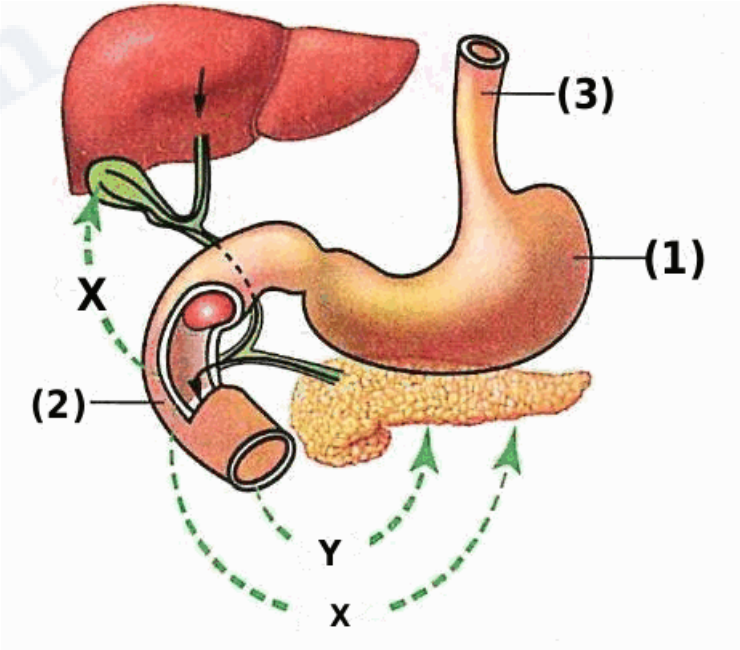
(A) (X) represents digestive enzymes, (Y) represents stimulating substances

(B) (Y) represents digestive enzymes, (X) represents stimulating substances

(C) Both (X) and (Y) represent digestive enzymes

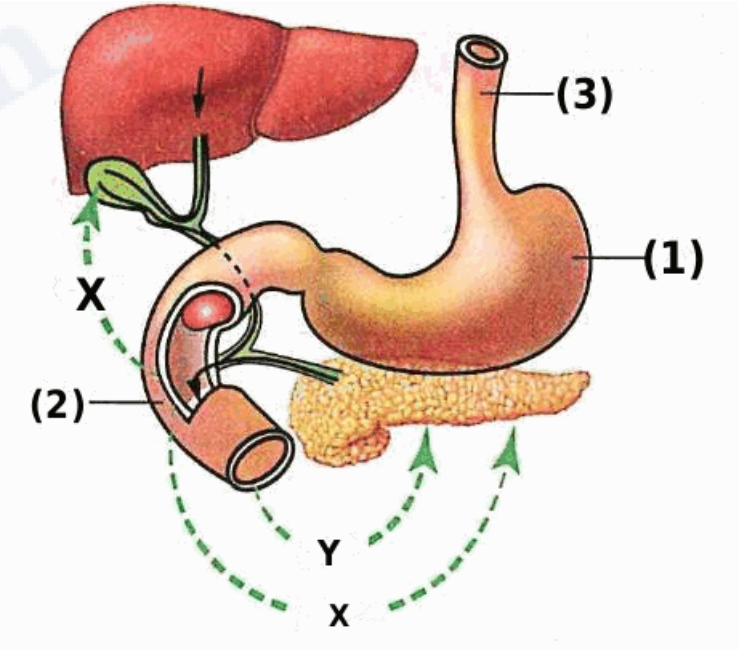
(D) Both (X) and (Y) represent stimulating substances

91 Study the opposite figure, which shows some parts of the digestive system, then answer:
Which choice in the following table correctly represents the substances (X) and (Y)?



(A) (X) cholecystokinin, (Y) secretin
(B) (X) secretin, (Y) cholecystokinin
(C) (X) gastrin, (Y) secretin
(D) (X) secretin, (Y) gastrin

92 Study the opposite figure, which shows some parts of the digestive system, then answer:
Which of the following secretes the substances (X) and (Y)?



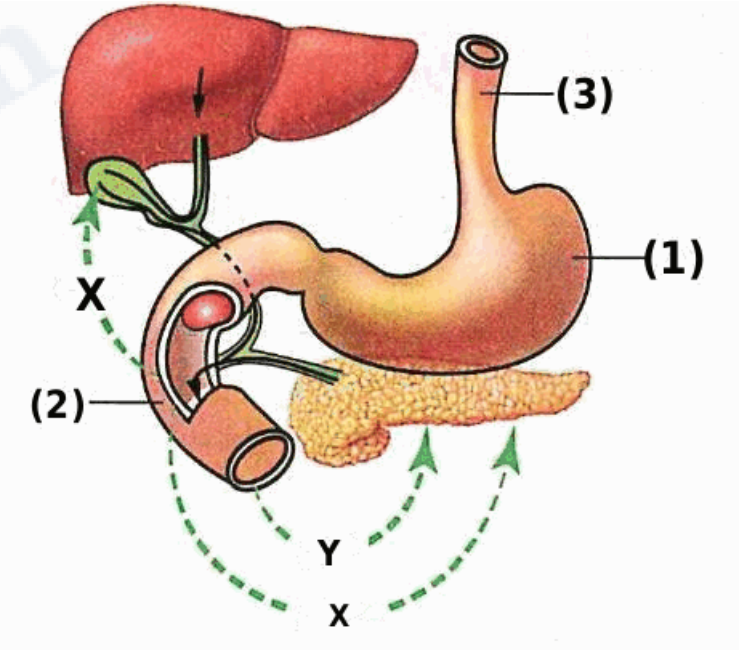
(A) The liver

(B) The duodenum

(C) The liver and the duodenum respectively

(D) The stomach and the duodenum respectively

93 Study the opposite figure, which shows some parts of the digestive system, then answer:
Which of the following stimulates the secretion of the substances (X) and (Y)?



(A) Food reaching structure (1)
(B) Food passing through structure (3)
(C) Food reaching structure (2)
(D) Food leaving structure (2)

94 Which hormone is secreted as soon as food reaches the stomach?
(A) Gastrin (B) Cholecystokinin (C) Secretin (D) Insulin

95 Which hormone affects the absorption of monosaccharides in the small intestine?
(A) Thyroxine (B) Secretin (C) Cortisone (D) Adrenaline

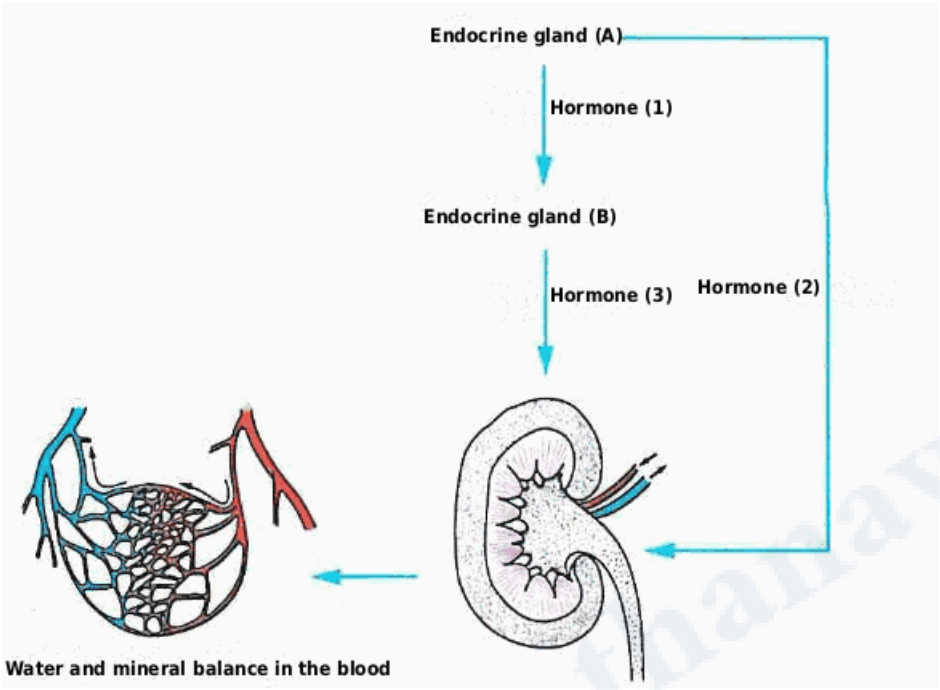
96 For which of the following hormones is the organ that secretes it the same as the organ that responds to it?
(A) Secretin (B) Gastrin (C) Cholecystokinin (D) Calcitonin

Essay questions — 11 questions

1 Study the opposite figure, then identify:

(1) The names of the endocrine glands (A) and (B).

(2) The names of the hormones (1), (2) and (3).



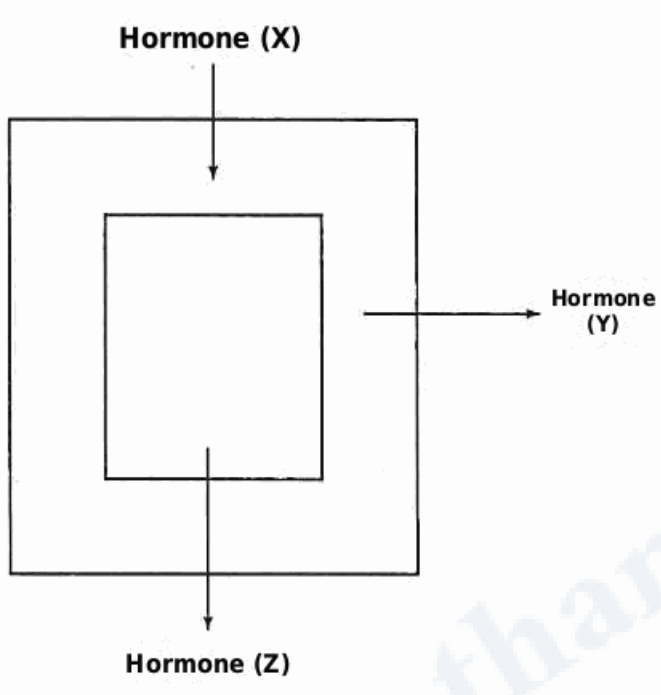
2 Diabetes insipidus is caused by a decrease in ADH secretion in the blood. Deduce its main symptoms, with explanation.

3 Study the opposite figure, which shows the structure of an endocrine gland in the human body, then answer:

(1) What is the chemical nature of hormone (Y)?

(2) What is hormone (X), and where is it secreted?

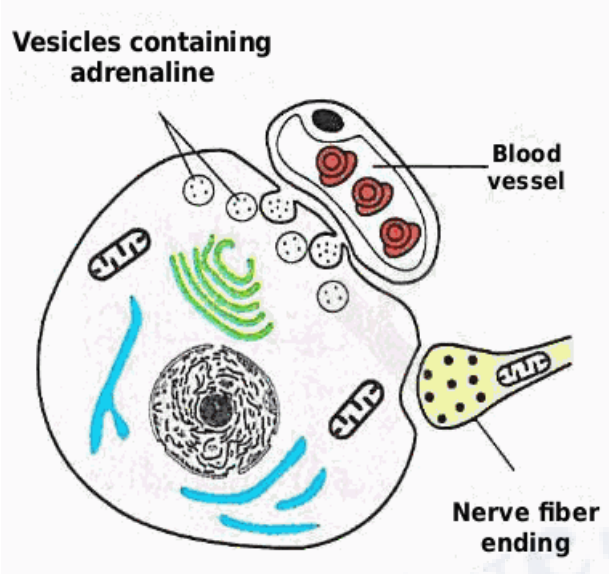
(3) What type of stimulation causes the secretion of hormone (Y) and hormone (Z)?



4 The opposite figure shows a cell in an endocrine gland. In light of this, answer:

(1) What is the name of the gland?

(2) How do you explain the presence of a blood vessel next to the gland cell?



5 The opposite table shows the result of a blood test of a patient:

ACTH: test result 80, normal range from 7.2 to 63.3

K^+: test result 5.8, normal range from 3 to 5

(1) What is the level of aldosterone? Explain your answer.

(2) What type of defect does this patient have? How can you tell?

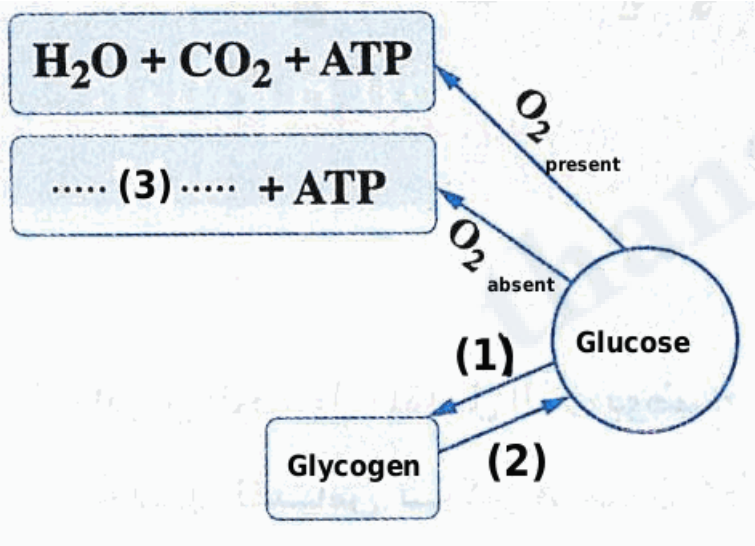
6 The opposite diagram shows the relation between some substances in the cells of the human body:

(1) When does conversion number (1) happen? Explain your answer.

(2) When does conversion number (2) happen? Explain your answer.

(3) What are the hormones used in conversion number (1) and conversion number (2)?

(4) What products does number (3) refer to?



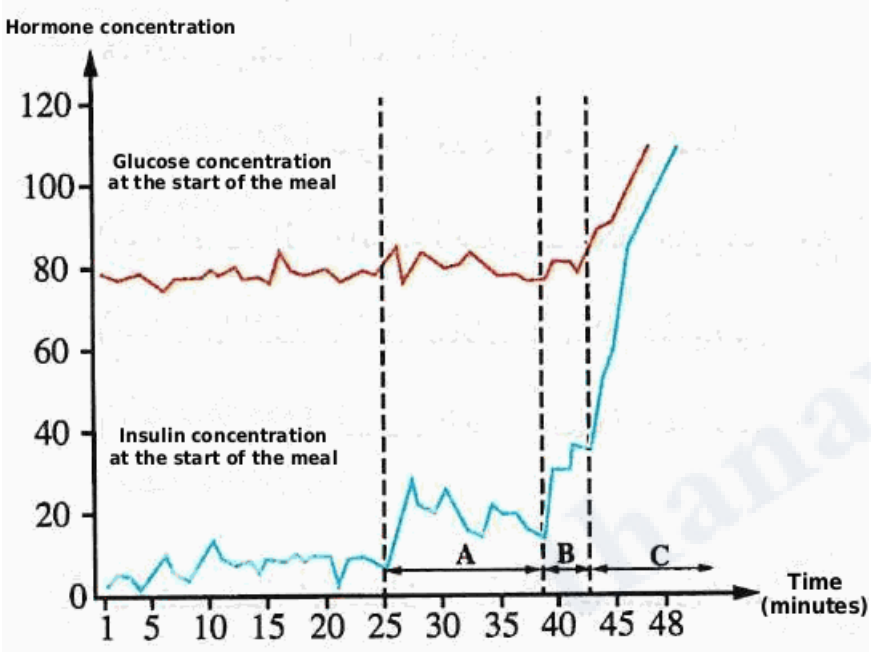
7 Study the opposite graph, then answer:

(1) Does the graph show the case of a healthy person or a sick person? Why?

(2) Explain the increase of insulin while the blood glucose level stays constant at the beginning of period (A).

(3) What is the importance of the increase of insulin in period (C)?

(4) What do you expect the shape of the glucose and insulin curves to be 4 hours after the meal?



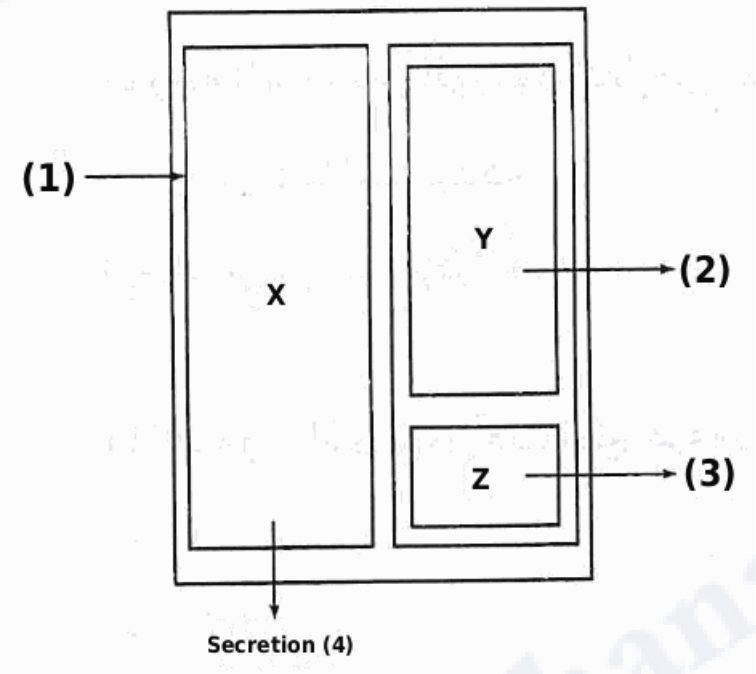
8 A very obese person was advised by his friend to eat less fatty food to lose weight, but he did not eat less starchy food, so his weight increased. What is the explanation for this?

9 The opposite diagram represents a mixed gland in the human body:

(1) What do (X), (Y) and (Z) represent?

(2) What do the hormones (1), (2) and (3) represent?

(3) What does secretion (4) represent?



10 Hormone (X) is secreted by three types of glandular tissue. Identify:

(1) The name of the hormone.

(2) The places where it is secreted.

(3) Its role.

11 Explain the relation between insulin deficiency and thirst.

Past exam questions — 32 questions

1 Study the opposite table, which shows the result of a test measuring the concentration of ACTH and aldosterone in the blood. What can you conclude? (Trial exam / June 2021)
ACTH: concentration in the blood 10.5, normal level from 0.5 to 2.5
Aldosterone: concentration in the blood 25, normal level from 5 to 10

(A) A defect in the adrenal cortex only
(B) The pituitary gland works normally and the adrenal cortex is swollen
(C) Both glands work normally
(D) The adrenal cortex is responding to the increased activity of the pituitary gland

---

2 Addison's disease is damage to the outer part of the adrenal gland. Which of the following results from this? (2nd session 2022)

(A) Enlargement of the jaw bones
(B) Brittle bones
(C) Swelling of the front part of the neck
(D) Irregular menstrual cycle in females

---

3 What is the similarity between the vasoconstrictor hormone and aldosterone? (1st session 2023, Sample exam 2025)

(A) Their target cells
(B) The type of cells that secrete them
(C) The stimulus that causes their secretion
(D) Their chemical structure

---

4 Which hormone is secreted under the effect of another hormone and as a result of a change in the level of an element in the blood? (2nd session 2024)

(A) Aldosterone (B) Thyroxine (C) Calcitonin (D) Parathormone

---

5 Adrenaline works to ..... (Sample exam 2025)

(A) stimulate the body to do the activities needed during emergencies
(B) stimulate the liver to convert glucose into glycogen
(C) make secondary sexual characteristics appear
(D) increase the body's resistance to infection and microbes

---

6 What causes a person to have a lower level of sodium ions in the blood than normal? (1st session 2025)

(A) A decrease in aldosterone

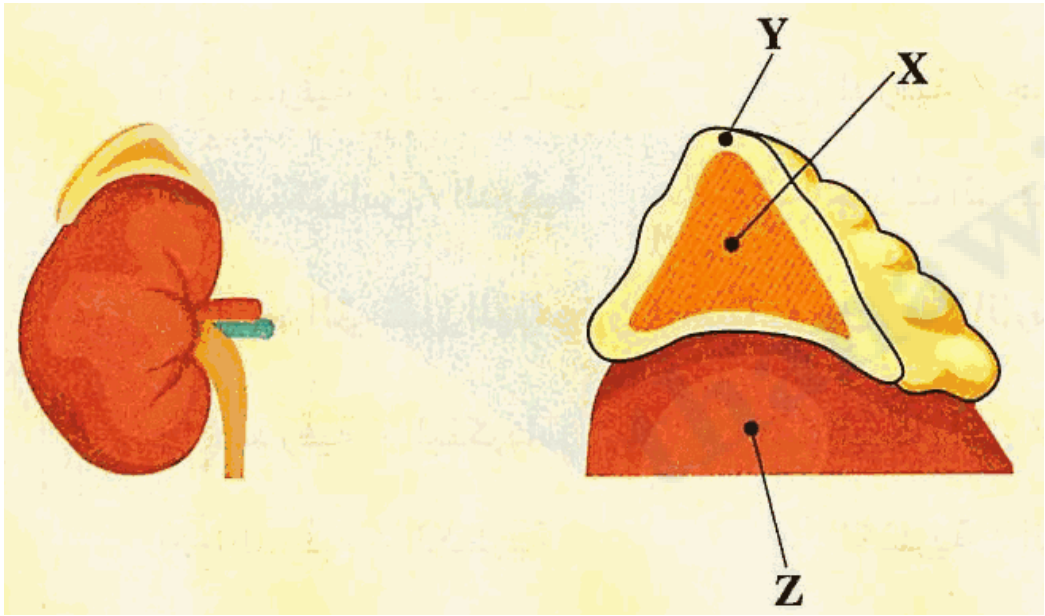
(B) An increase in aldosterone

(C) A decrease in parathormone

(D) An increase in the vasoconstrictor hormone

---

7 The opposite figure shows one of the endocrine glands in the human body. Which of the parts marked with letters is actually a glandular part? (2nd session 2025)



(A) (X) only

(B) (Y) only

(C) Both (X) and (Y)

(D) Both (Y) and (Z)

---

8 When ACTH increases in the blood and cortisone decreases, this is because of a defect in ..... (Sample exam 2026)

(A) the adrenal cortex

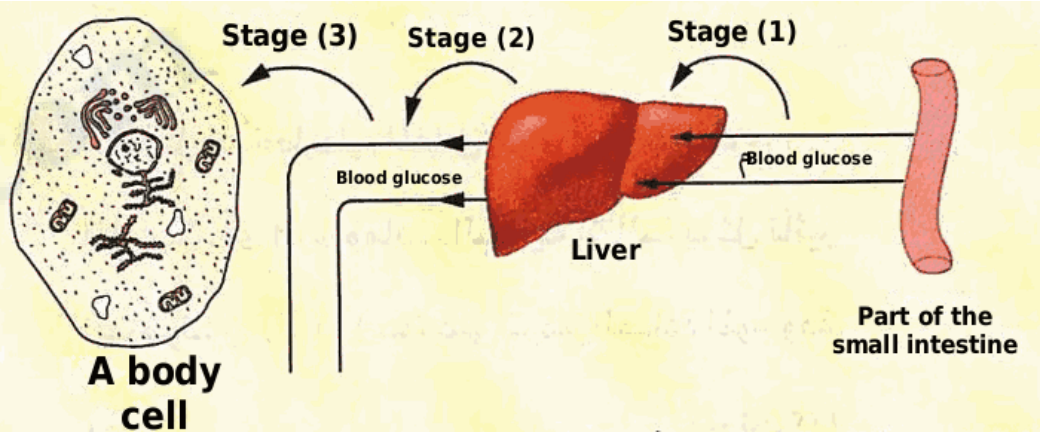
(B) the glandular part of the pituitary gland

(C) the adrenal cortex and the glandular part of the pituitary gland

(D) the cortex and medulla of the adrenal gland

---

9 The opposite figure shows the role of two hormones secreted by the same gland. Which of the following is the correct effect of the two hormones? (Trial exam / May 2021)



(A) A decrease of the hormone in stage (1) is accompanied by a fall of glycogen in the liver

(B) An increase of the hormone in stage (1) is accompanied by a fall of glycogen in the liver

(C) A decrease of the hormone in stage (3) is accompanied by a rise of glucose inside the cell

(D) An increase of the hormone in stage (2) is accompanied by a fall of glucose in the blood

---

10 What are the two types of stimuli for the duct and ductless glands of the pancreas respectively? (Trial exam / June 2021)

(A) Hormonal / hormonal

(B) The concentration of a certain substance in the blood / hormonal

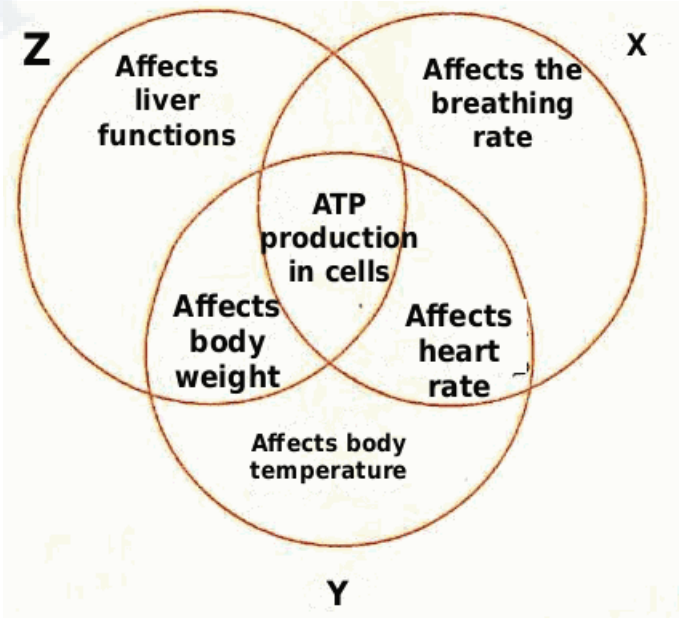
(C) The concentration of a certain substance in the blood / the concentration of a certain substance in the blood

(D) Hormonal / the concentration of a certain substance in the blood

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11 The opposite diagram shows the effect of three hormones (X), (Y) and (Z) on different parts of the human body. Study it, then answer:

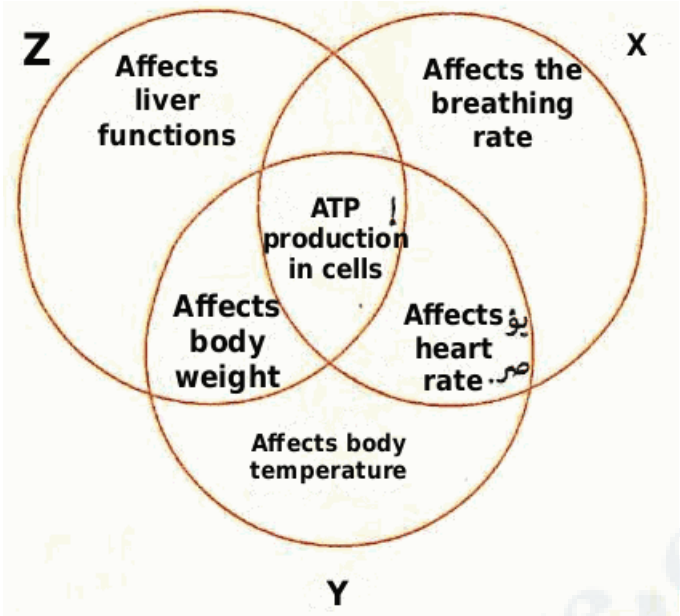
(1) Which glands secrete the hormones (Y) and (Z) respectively? (1st session 2021)



(A) The thyroid / the pancreas
(B) The thyroid / the parathyroids
(C) The pancreas / the thyroid
(D) The parathyroids / the pancreas

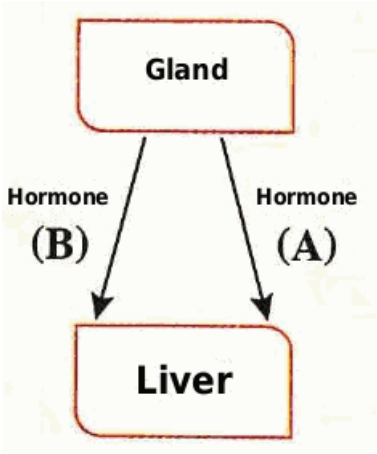
12 The opposite diagram shows the effect of three hormones (X), (Y) and (Z) on different parts of the human body. Study it, then answer:

(2) Which glands secrete the hormones (X) and (Y) respectively? (2nd session 2021)



(A) The thyroid / the pancreas
(B) The pancreas / the adrenal gland
(C) The thyroid / the adrenal gland
(D) The adrenal gland / the thyroid

13 What affects the secretion of the hormones (A) and (B) in the opposite diagram? (1st session 2022)



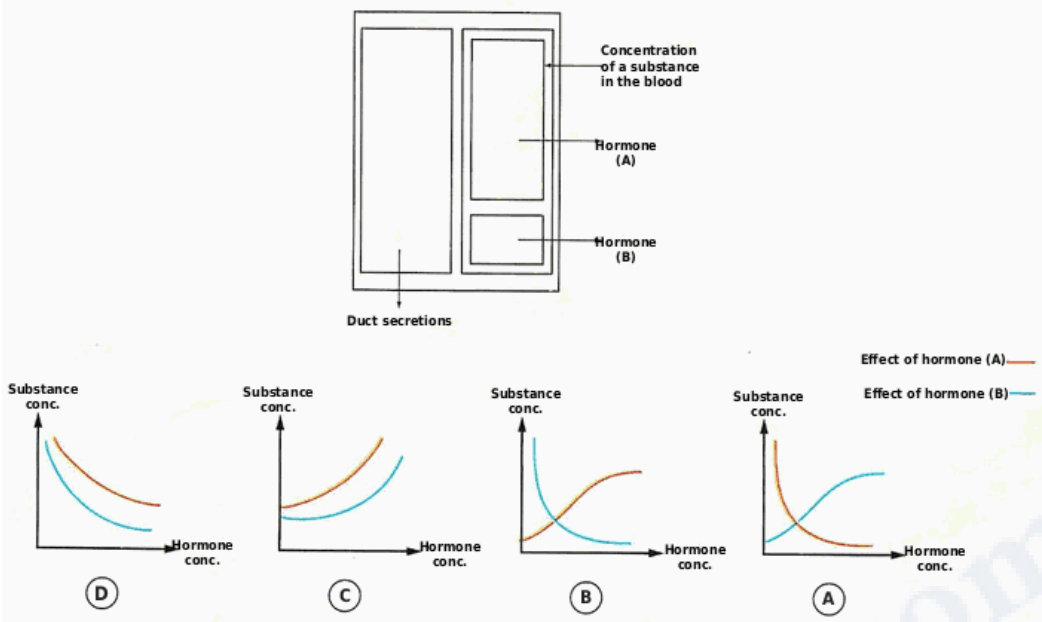
(A) Fat accumulation in the liver

(B) Pituitary hormones

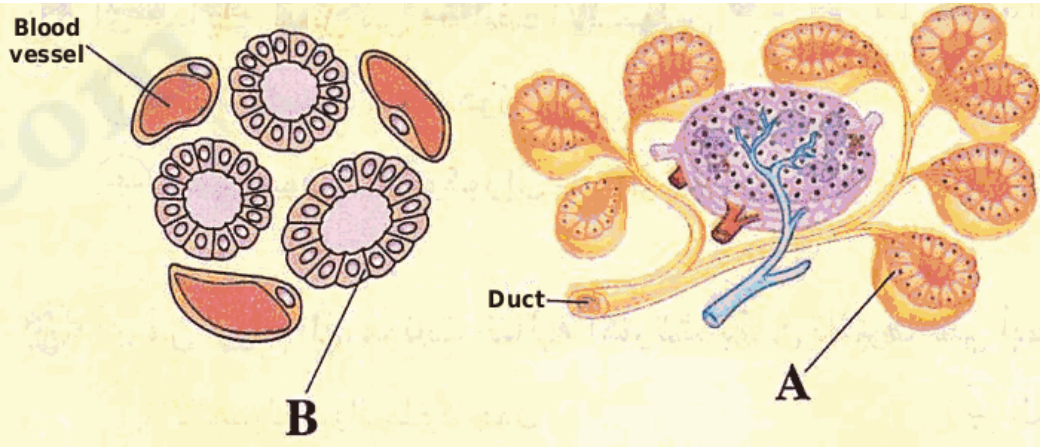
(C) The blood glucose level

(D) The sodium and potassium level in the blood

14 The opposite diagram represents one of the organs of the human body. Which of the following graphs shows the effect of the hormones (A) and (B) on the concentration of the substance in the blood? (2nd session 2022)



15 The opposite figure shows two different types of gland cells in the human body. What distinguishes gland (A) from gland (B)? (Trial exam 2023)



(A) It secretes hormones
(B) It controls the blood sugar level
(C) It controls the metabolic rate
(D) It secretes digestive enzymes

---

16 A person eats large amounts of carbohydrates in his meals. What is the result of eating these amounts? (Trial exam 2023)

(A) Fat deposition in the liver cells
(B) Conversion of glycogen into glucose
(C) The person becomes thin
(D) A decrease of fats in the muscle cells

---

17 What role does insulin play in the oxidation of glucose inside the body cells? (1st session 2023, Sample exam 2025)

(A) It converts the extra glucose into glycogen, which is oxidized when needed
(B) It activates the respiratory enzymes inside the liver and muscle cells
(C) It allows glucose to pass through the membranes of the body cells
(D) It allows glucose to pass through the intestine lining into the blood

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18 What distinguishes the beta cells of the pancreas from the cells of the posterior lobe of the pituitary gland? (1st session 2024)

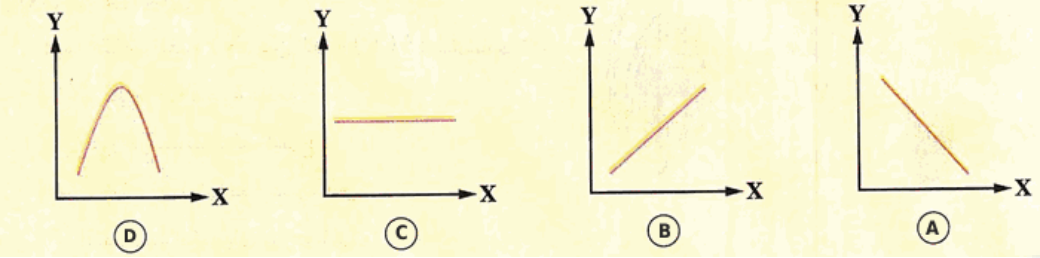
(A) They are activated by other hormones
(B) They produce hormones
(C) They pour their contents directly into the blood
(D) Their secretions increase the blood glucose level

---

19 Which process does insulin NOT take part in? (2nd session 2023)

(A) Energy production
(B) Glycogen formation
(C) Regulating blood pressure
(D) Homeostasis

20 Which of the following graphs shows the relation between urine concentration (Y) and the concentration of insulin in the blood (X) during the treatment of a diabetic patient? (2nd session 2025)



21 Which of the following is NOT a function of insulin? (Sample exam 2025)

(A) Stimulating the oxidation of glucose
(B) Transporting fructose across cell membranes
(C) Stimulating the conversion of glucose into glycogen
(D) Lowering blood sugar levels

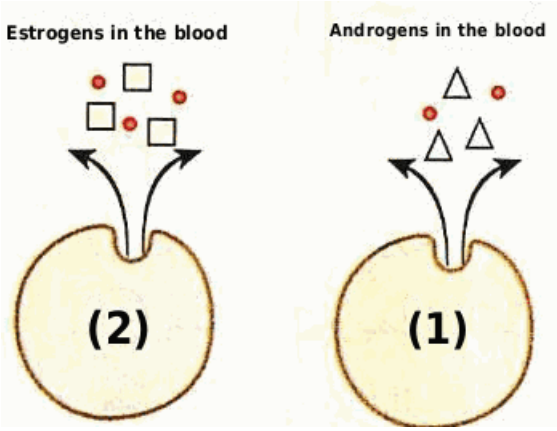
22 Which of the following pairs of hormones are most similar in their effect on carbohydrate metabolism? (Sample exam 2025)

(A) Insulin and glucagon
(B) Glucagon and adrenaline
(C) Insulin and cortisone
(D) Cortisone and thyroxine

23 The secretion of which of the following hormones is related to the body cells' need for energy? (Sample exam 2025)

(A) Adrenaline (B) Thyroxine (C) Insulin (D) Gastrin

24 Study the glands (1) and (2), then identify the property of both glands (1) and (2). (1st session 2022)



(A) Duct glands
(B) Their hormones are steroids
(C) Their hormones are proteins
(D) Their secretion increases in childhood

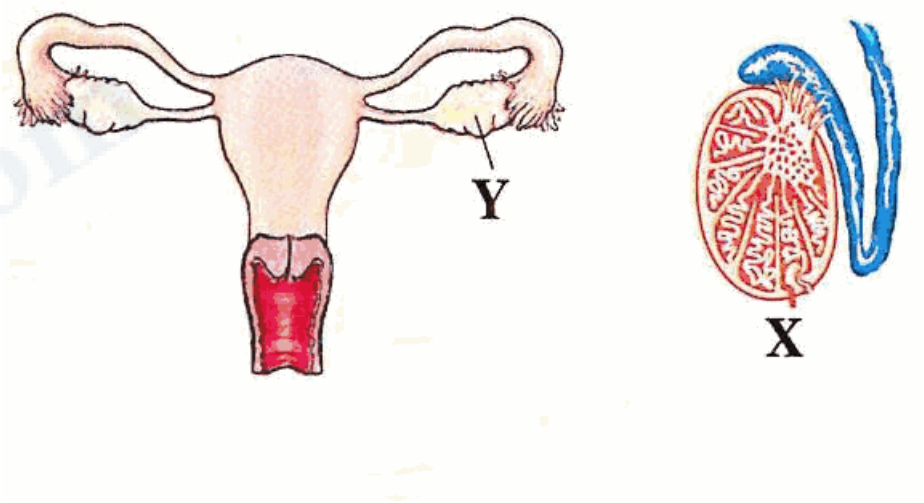
25 What is the source / are the sources of the hormones that affect both the male reproductive system and fertility? (1st session 2024)

(A) The pituitary gland only
(B) The testes and the pituitary gland
(C) The pituitary gland and the adrenal cortex
(D) The testes, the adrenal cortex and the pituitary gland

26 What is the similarity between the mammary glands and the Graafian follicle in the human female? (2nd session 2024)

(A) Their secretions are internal, inside the body
(B) Their secretions are external, inside the body
(C) They work under hormonal stimulation
(D) They work under nervous stimulation

27 In the opposite figure, how does gland (X) differ from gland (Y)? (Sample exam 2026)



(A) Its ductless structures are permanent
(B) It secretes its hormones at puberty
(C) Its activity stops after a certain age
(D) The chemical class of its hormones

28 The mammary glands are affected by many hormones. Which of the following shows the correct order in which these hormones act on them? (Sample exam 2025)

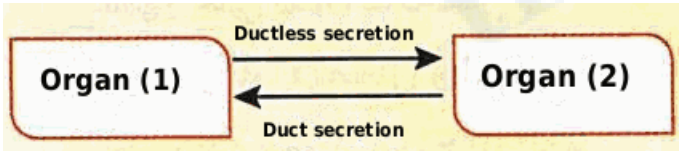
(A) Progesterone, then estrogen, then oxytocin, then prolactin
(B) Estrogen, then progesterone, then prolactin, then oxytocin
(C) Progesterone, then estrogen, then prolactin, then oxytocin
(D) Estrogen, then progesterone, then oxytocin, then prolactin

29 When a person ate a meal rich in starchy substances, the processes shown in the opposite table happened. If each of the four processes happens under the effect of certain hormones, which of the following hormones are NOT secreted normally? (2nd session 2021)

Normal rate		Rate after the meal	Process
To	From		
90	40	20	Secretion of pancreatic enzymes
300	200	70	Glucose absorption
11	3	5	Passage of glucose into the cells
50	27	35	Glucose oxidation

(A) Secretin and insulin
(B) Insulin and adrenaline
(C) Secretin and thyroxine
(D) Thyroxine and adrenaline

30 The diagram in front of you represents two organs inside the human body. Which of the following represents the ductless secretion? (1st session 2022)

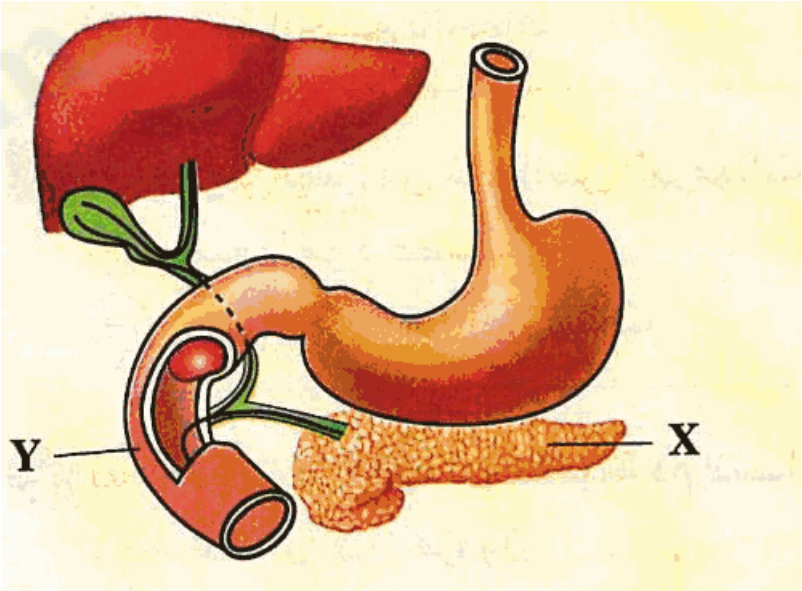


(A) Gastrin
(B) Prolactin
(C) Secretin
(D) ADH

31 Which of the following statements correctly describes the action of gastrin? (2nd session 2023)

(A) It stimulates the same type of cells that secreted it in the stomach lining
(B) It goes directly from the secreting cells to the target cells in the stomach lining
(C) It stimulates a type of cells other than the ones that secreted it in the stomach lining
(D) It has receptors in all types of cells lining the stomach

32 From the opposite figure, which of the following is correct about (X) and (Y)? (Sample exam 2026)



(A) The hormones of (X) affect the liver, and the hormones of (Y) affect the duct part of (X)

(B) The hormones of (X) affect the liver, and the hormones of (Y) affect the ductless part of (X)

(C) The hormones of (X) and (Y) stimulate the secretion of endocrine glands

(D) The hormones of (X) and (Y) activate the secretion of duct glands

Answer key and solutions

Multiple choice questions

1 D	2 A	3 B	4 C	5 B	6 C	7 B	8 C	9 B	10 C
11 D	12 A	13 B	14 B	15 C	16 C	17 C	18 B	19 D	20 A
21 B	22 A	23 C	24 A	25 A	26 B	27 C	28 B	29 C	30 C
31 B	32 C	33 A	34 A	35 A	36 C	37 B	38 C	39 B	40 D
41 A	42 D	43 C	44 C	45 A	46 C	47 B	48 A	49 B	50 A
51 C	52 C	53 D	54 D	55 A	56 C	57 A	58 D	59 D	60 D
61 D	62 D	63 D	64 C	65 B	66 C	67 C	68 B	69 B	70 C
71 B	72 B	73 D	74 B	75 B	76 C	77 A	78 C	79 B	80 B
81 B	82 D	83 C	84 D	85 C	86 C	87 B	88 C	89 D	90 D
91 A	92 B	93 C	94 A	95 A	96 B				

1 **Answer (D)**

The condition is caused by an increase in male hormones (androgens).

Androsterone medicines, or a defect in the adrenal cortex or the anterior lobe, may increase them.

The nerve cells of the hypothalamus are not a possible cause.

2 **Answer (A)**

More ADH increases water reabsorption in the kidneys.

So water in the blood increases and its sodium concentration decreases.

3 **Answer (B)**

The problem is too much ADH, so it is treated by reducing its effect.

So ADH inhibitors are used.

4 **Answer (C)**

Aldosterone acts on the kidneys and increases sodium reabsorption.

5 **Answer (B)**

ACTH stimulates the adrenal cortex to secrete cortisone.

6 **Answer (C)**

Aldosterone reabsorbs sodium and excretes potassium in urine.

So potassium in the blood decreases.

7 **Answer (B)**

(X) is the thyroid, (Y) the parathyroids and (Z) the adrenal gland.

(1) The thyroid and the adrenal gland: stimulated by the anterior lobe (TSH and ACTH).

(2) The parathyroids and the adrenal gland: calcium and sodium are needed for muscle contraction.

(3) The thyroid and the parathyroids: both affect the calcium level.

(4) All are endocrine glands whose secretions move through the blood.

8 **Answer (C)**

Less aldosterone means less sodium reabsorption, so sodium increases in urine.

And less potassium is excreted, so potassium decreases in urine.

Sodium (red) rises and potassium (blue) falls.

9 **Answer (B)**

ADH is secreted from the nerve cell endings in the posterior lobe.

Aldosterone is secreted from the adrenal cortex.

10 **Answer (C)**

Salted fish raises blood osmolarity.

So more ADH is secreted to reabsorb water.

11 **Answer (D)**

Cortisone affects carbohydrate metabolism.

And it is secreted under the effect of ACTH.

12 **Answer (A)**

Aldosterone and ADH control the reabsorption of water and salts in the kidneys.

So the concentration of urine changes.

13 **Answer (B)**

Sports activity is an emergency state in which adrenaline increases.

14 **Answer (B)**

Damage to the cortex decreases aldosterone.

So sodium reabsorption decreases and potassium excretion decreases.

Sodium falls and potassium rises in the blood.

15 **Answer (C)**

ACTH stimulates the adrenal cortex to secrete cortisone.

So more ACTH means more cortisone.

16 **Answer (C)**

(X) arrives through the blood: ACTH.

(Y) leaves the medulla, which is stimulated by the nerve: adrenaline.

(Z) comes from the cortex: aldosterone.

17 **Answer (C)**

Adrenaline is produced by direct nervous stimulation.

The cortex hormones need ACTH and its transport through the blood.

18 **Answer (B)**

Nervous stimulation makes the medulla secrete adrenaline quickly.

And adrenaline raises blood pressure.

19 **Answer (D)**

More adrenaline increases the heart rate and blood glucose, and the stored glycogen decreases.

The rate of cellular respiration increases, so more CO_2 is released.

So graph (D) is not correct.

20 **Answer (A)**

The muscle response needs sodium to enter the muscle fiber.

Aldosterone reabsorbs sodium in the kidneys.

21 **Answer (B)**

A rise in aldosterone increases sodium reabsorption in the kidneys.

So the sodium level in urine falls.

22 **Answer (A)**

ACTH stimulates the cortex to secrete aldosterone.

Aldosterone is what affects urine, so the effect of ACTH is indirect.

23 **Answer (C)**

ADH from the nervous part reabsorbs water.

Aldosterone from the cortex reabsorbs sodium.

24 **Answer (A)**

(1) ACTH from the pituitary stimulates the adrenal cortex.

(2) Aldosterone acts on the kidneys.

(3) Adrenaline acts on the liver.

25 **Answer (A)**

Little salt lowers sodium in the blood.

So more aldosterone is secreted to make up for it.

26 **Answer (B)**

The outer layer is the cortex.

Removing it decreases aldosterone secretion.

27 **Answer (C)**

Insulin, glucagon and adrenaline directly affect liver glycogen.

Thyroxine only regulates metabolism.

28 **Answer (B)**

(X) rises and (Y) falls.

Aldosterone raises sodium in the blood; it does not lower it.

So choice (B) is not correct.

29 **Answer (C)**

(X) decreases and (Z) increases, so the relation is inverse.

Insulin decreases, so blood glucose rises.

30 **Answer (C)**

Type one: no insulin in the blood and glucose is high (Z).

Type two: insulin is present but the cell does not respond, so glucose does not enter it (Y).

31 **Answer (B)**

(X) affects all cells: thyroxine.

(Y) comes from nerve cells: oxytocin.

(Z) affects the gonads: LH.

32 **Answer (C)**

The pancreas secretes insulin and glucagon.

They regulate the metabolism of glucose and fats.

33 **Answer (A)**

Fasting lowers blood glucose.

So glucagon increases to raise it.

34 **Answer (A)**

Glucagon is secreted by alpha cells.

It acts on the liver, converting glycogen into glucose.

35 **Answer (A)**

Insulin increases membrane permeability, so glucose moves from the blood into the cells.

36 **Answer (C)**

A rise in glucose increases insulin secretion.

So glucose is converted into glycogen and its level in the blood falls.

37 **Answer (B)**

(A to B) glucose falls: insulin.

(C to D) it rises to normal: glucagon.

(D to X) it rises above normal: adrenaline.

38 **Answer (C)**

Hormone (B) lowers glucose, so it is insulin.

It is stimulated by (X), which is the beta cells of the pancreas.

39 **Answer (B)**

(A) raises glucose: glucagon.

(B) lowers it: insulin.

40 **Answer (D)**

Insulin converts glucose into glycogen.

And it increases the formation of fats.

41 **Answer (A)**

Insulin increases the entry of glucose into the cells, including muscles.

42 **Answer (D)**

Tying the duct only stops the enzymes from reaching the intestine.

Insulin reaches the blood directly, so glucose is not affected in either mouse.

43 **Answer (C)**

The sugar in the juice raises glucose quickly.

So insulin is secreted quickly.

44 **Answer (C)**

Insulin lowers glucose and increases its storage as glycogen and fats.

45 **Answer (A)**

In diabetes, glucose does not enter the cells, so it rises in the blood.

If it rises above the kidney threshold, it appears in urine.

46 **Answer (C)**

(X) are duct cells that secrete the pancreatic juice.

They are activated by the duodenum hormones and the nerve impulse.

47 **Answer (B)**

(Y) and (Z) are cells of the islets of Langerhans.

Their work depends on the blood glucose concentration.

48 **Answer (A)**

Glucose stays between about 80 and 125 and returns to normal after each rise.

So the person is healthy.

49 **Answer (B)**

Insulin is secreted when glucose rises.

The highest glucose concentration is at point (2).

50 **Answer (A)**

Glucose entering the blood raises its concentration.

So it inhibits alpha cells and stimulates beta cells.

51 **Answer (C)**

In (1) glucose is low and rises to normal.

Glucagon converts glycogen into glucose, so glycogen decreases.

52 **Answer (C)**

The rise from (B) to (C) is caused by the absorption of food.

The fall from (C) to (D) is caused by insulin secretion.

53 **Answer (D)**

Glucose rises after meals (8 a.m. and 1 p.m.) then returns to normal.

This is normal after a balanced meal.

54 **Answer (D)**

In a normal person, glucose rises a little after the meal.

The extra glucose is stored as glycogen, so liver glycogen increases.

55 **Answer (A)**

Stage (X): glucose and insulin fluctuate around normal.

Stage (Y): glucose is high and insulin is low.

56 **Answer (C)**

Healthy before the age of forty.

After that, glucose rises and insulin falls, so the person has diabetes.

57 **Answer (A)**

Thyroxine and insulin affect all body cells.

The other hormones have specific target organs.

58 **Answer (D)**

Glucagon, thyroxine and adrenaline increase with activity.

Calcitonin regulates calcium and is not related to sports activity.

59 **Answer (D)**

Both are hormones that move through the blood.

They differ in their target organs.

60 **Answer (D)**

Oxytocin comes from the posterior lobe of the pituitary, a permanent gland.

The others come from temporary glands (Graafian follicle, corpus luteum, placenta).

61 **Answer (D)**

Calcitonin regulates calcium and does not affect the mammary glands.

62 **Answer (D)**

At the end of pregnancy relaxin increases to widen the birth canal.

Low blood pressure increases ADH secretion.

63 **Answer (D)**

Estrogen replaces the ovaries.

So secondary sexual characteristics appear.

64 **Answer (C)**

(Y) is the Graafian follicle, an endocrine gland that secretes estrogen.

(Z) is the ovum, a sex cell.

65 **Answer (B)**

(Y) is the Graafian follicle.

Its growth is stimulated by FSH.

66 **Answer (C)**

The interstitial cells secrete testosterone.

Testosterone increases muscle strength at puberty.

67 **Answer (C)**

In the female, FSH develops the Graafian follicle.

LH causes ovulation and forms the corpus luteum.

68 **Answer (B)**

(X) is a steroid hormone: testosterone.

(Y) develops the Graafian follicle in the female: FSH.

(Z) develops the interstitial cells that secrete testosterone: LH.

69 **Answer (B)**

Progesterone maintains the uterus lining during pregnancy.

70 **Answer (C)**

(X) stimulates two glands: the anterior lobe of the pituitary.

(Y) develops the two seminal vesicles: the interstitial cells of the testis.

(Z) develops the mammary glands: the Graafian follicle.

71 **Answer (B)**

(1) LH stimulates the interstitial cells.

(3) Androsterone develops the two seminal vesicles.

72 **Answer (B)**

(2) FSH stimulates the Graafian follicle.

(4) Estradiol from it develops the mammary glands.

73 **Answer (D)**

Cell (X) is a sperm.

It is formed under the effect of FSH from the anterior lobe of the pituitary.

74 **Answer (B)**

(L) is an embryo.

Progesterone maintains the uterus lining during pregnancy.

75 **Answer (B)**

(S) forms the corpus luteum: LH.

(Y) develops the follicle: FSH.

(Z) comes from the follicle: estrogen.

(L) comes from the corpus luteum: progesterone.

76 **Answer (C)**

The prolactin concentration increases during pregnancy to prepare for milk production.

77 **Answer (A)**

Prolactin is secreted from the glandular part of the pituitary gland.

78 **Answer (C)**

Early puberty in girls is caused by estrogen.

79 **Answer (B)**

FSH is lower in group (X).

FSH stimulates sperm production, so the males of (X) produce fewer sperms.

80 **Answer (B)**

Lower FSH develops fewer follicles.

So estrogen is lower in the females of group (X).

81 **Answer (B)**

LH stimulates testosterone secretion.

Testosterone develops the comb, so the effect of LH is indirect.

82 **Answer (D)**

Gland (B) is mixed: one secretion passes through a duct, and a hormone is poured into the blood.

So it is the testis, and it works after puberty.

83 **Answer (C)**

Gland (A) is the pancreas: secretion (2) into the blood is insulin.

Secretion (4) from the testis into the blood: testosterone.

84 **Answer (D)**

In (X), LH from the anterior lobe decreases, so testosterone decreases.

In (Y), the testis itself is affected, so testosterone also decreases.

85 **Answer (C)**

Complete failure of the testis stops sperm production.

So sterility happens.

86 **Answer (C)**

The anterior lobe stimulates the ovary with FSH and LH to secrete estrogen.

A defect in it delays breast growth.

87 **Answer (B)**

LH stimulates testosterone secretion, and testosterone and androsterone make the beard appear.

FSH only affects sperm production.

88 **Answer (C)**

The increase in the number of follicles in the ovary is caused by more FSH.

FSH comes from the glandular part of the pituitary.

89 **Answer (D)**

The stomach lining secretes gastrin.

The esophagus lining has no endocrine gland cells.

90 **Answer (D)**

The two arrows represent two hormones from the duodenum.

They stimulate the secretion of bile and pancreatic juice.

91 **Answer (A)**

(X) acts on the gall bladder and the pancreas: cholecystokinin.

(Y) acts on the pancreas: secretin.

92 **Answer (B)**

The two hormones are secreted by the duodenum.

93 **Answer (C)**

Structure (2) is the duodenum.

Food reaching it stimulates the secretion of the two hormones.

94 **Answer (A)**

Gastrin is secreted by the stomach lining when food reaches it.

95 **Answer (A)**

Thyroxine increases the absorption of monosaccharides in the intestine.

96 **Answer (B)**

Gastrin is secreted by the stomach lining, and the stomach itself responds to it.

Essay questions

1 **Model answer**

(1) (A) The pituitary gland, (B) the adrenal gland.

(2) (1) Adrenocorticotropic hormone (ACTH), (2) antidiuretic hormone (ADH), (3) aldosterone.

2 **Model answer**

Frequent urination and thirst / because large amounts of water are excreted. This is due to the decrease in ADH secretion, which increases the amount of urine because water is not reabsorbed from the tubules of the kidney nephrons.

3 **Model answer**

(1) It is made of steroids.

(2) Hormone (X) is ACTH / it is secreted by the anterior lobe of the pituitary gland.

(3) Hormone (Y) is secreted by hormonal stimulation, while hormone (Z) is secreted by nervous stimulation.

4 **Model answer**

(1) The adrenal gland (the medulla).

(2) Because it is an endocrine gland that secretes its hormones directly into the blood.

5 **Model answer**

(1) Low / the rise of potassium in the blood shows that the aldosterone level is low, so the extra potassium is not removed by the kidneys.

(2) Failure of the adrenal cortex / the concentration of potassium ions K^+ in the blood is high even though more adrenocorticotropic hormone (ACTH) is secreted, because the aldosterone level is low as a result of this failure.

6 **Model answer**

(1) Conversion (1) happens when insulin is secreted because the blood glucose concentration is high / to lower the blood glucose concentration by converting glucose into glycogen, which is stored in the liver and muscles.

(2) Conversion (2) happens when glucagon or adrenaline is secreted because the blood glucose concentration is low, for example because of physical effort / to raise the blood glucose concentration by converting the glycogen stored in the liver.

(3) Conversion (1): insulin is used; conversion (2): glucagon and adrenaline are used.

(4) (3) Lactic acid.

7 **Model answer**

(1) A healthy person / because the beta cells of the pancreas secrete insulin when the blood glucose concentration increases, to keep the normal blood sugar level.

(2) Insulin increases while blood glucose stays constant at the beginning of period (A) because in this period insulin allows monosaccharides (except fructose) to pass through the cell membrane into the cell and stimulates the oxidation of glucose in the different body cells and tissues.

(3) Insulin increases in period (C) because the blood glucose concentration increases, so it lowers it by converting glucose into glycogen stored in the liver and muscles, or into fatty substances stored in the different body tissues.

(4) 4 hours after the meal glucose decreases, so insulin also decreases, because insulin increases as blood glucose increases.

8 **Model answer**

Insulin stimulates the conversion of the extra glucose that the body does not need (produced by digesting starch) into fatty substances that are stored in the different body tissues, which causes obesity.

9 **Model answer**

(1) (X) The cells of the pancreatic juice ducts, (Y) beta cells of the islets of Langerhans, (Z) alpha cells of the islets of Langerhans.

(2) (1) Secretin or cholecystokinin, (2) insulin, (3) glucagon.

(3) (4) The pancreatic juice.

10 **Model answer**

(1) Relaxin.

(2) It is secreted by the corpus luteum in the ovary, the placenta and the uterus lining.

(3) Its secretion increases at the end of pregnancy, and it relaxes the pubic symphysis to make birth easier.

11 **Model answer**

Insulin deficiency causes a defect in glucose metabolism, so the glucose level in the blood and urine rises. This is accompanied by the excretion of large amounts of water in urine, which causes thirst.

Past exam questions

1	2	3	4	5	6	7	8	9	10
D	D	A	A	A	A	C	A	A	D

11	12	13	14	15	16	17	18	19	20
A	D	C	A	D	A	C	B	C	B
21	22	23	24	25	26	27	28	29	30
B	B	B	B	D	C	A	B	C	C
31	32								
C	A								

1 **Answer (D)**

ACTH is high and aldosterone is high, so the adrenal cortex is responding to the increased activity of the pituitary gland.

2 **Answer (D)**

The adrenal cortex secretes sex hormones, so its damage may cause an irregular menstrual cycle in females.

3 **Answer (A)**

The vasoconstrictor hormone (ADH) and aldosterone both target the kidney tubules to regulate water and salts.

4 **Answer (A)**

Aldosterone is secreted under the effect of ACTH and according to the level of sodium and potassium in the blood.

5 **Answer (A)**

Adrenaline is the emergency hormone; it prepares the body to face danger.

6 **Answer (A)**

Aldosterone reabsorbs sodium in the kidneys, so its decrease causes a decrease of sodium in the blood.

7 **Answer (C)**

(X) is the adrenal medulla and (Y) is its cortex, and both are glandular parts; (Z) is the kidney.

8 **Answer (A)**

More ACTH with less cortisone means the pituitary is healthy and the defect is in the adrenal cortex.

9 **Answer (A)**

In stage (1) insulin converts glucose into glycogen in the liver, so a decrease of insulin lowers glycogen.

10 **Answer (D)**

The duct part is stimulated by hormones (secretin), and the ductless part by the blood glucose concentration.

11 **Answer (A)**

(Y) affects body temperature, body weight and heart rate: thyroxine from the thyroid.
(Z) affects liver functions and ATP production: insulin from the pancreas.

12 **Answer (D)**

(X) affects the breathing rate and heart rate: adrenaline from the adrenal gland, and (Y) is thyroxine from the thyroid.

13 **Answer (C)**

The pancreas secretes insulin and glucagon, which act on the liver, according to the blood glucose level.

14 **Answer (A)**

Hormone (A) from the beta cells (insulin) lowers glucose, and hormone (B) from the alpha cells (glucagon) raises it.

15 **Answer (D)**

Gland (A) is the pancreas, a mixed gland with ducts that secrete digestive enzymes, while (B) is an endocrine gland.

16 **Answer (A)**

Insulin converts the extra glucose into glycogen and fats that are deposited in the liver cells.

17 **Answer (C)**

Insulin allows glucose to pass through the cell membranes so that it is oxidized inside them.

18 **Answer (B)**

Beta cells produce insulin, while the posterior lobe stores hormones produced by the hypothalamus cells.

19 **Answer (C)**

Insulin does not take part in regulating blood pressure.

20 **Answer (B)**

As insulin increases, less water is lost with sugar in urine, so urine concentration increases; the relation is direct.

21 **Answer (B)**

Insulin allows monosaccharides to pass, except fructose.

22 **Answer (B)**

Glucagon and adrenaline both raise the blood glucose level.

23 **Answer (B)**

Thyroxine regulates the metabolic rate and energy production in the body cells.

24 **Answer (B)**

Androgens and estrogens are steroid hormones.

25 **Answer (D)**

The testes (testosterone), the adrenal cortex (sex hormones) and the pituitary (FSH and LH) all have an effect.

26 **Answer (C)**

The mammary glands are affected by prolactin, and the Graafian follicle by FSH, so both work under hormonal stimulation.

27 **Answer (A)**

The ductless structures of the testis (X) (the interstitial cells) are permanent, while the ovary (Y) has the temporary corpus luteum.

28 **Answer (B)**

Estrogen then progesterone develop the mammary glands, then prolactin for milk production, then oxytocin for milk release.

29 **Answer (C)**

The secretion of pancreatic enzymes is low (secretin) and glucose absorption is low (thyroxine); the rest are normal.

30 **Answer (C)**

Organ (2), the duodenum, secretes secretin (ductless) to the pancreas (1), which secretes its juice into a duct.

31 **Answer (C)**

Gastrin is secreted by cells in the stomach and stimulates other cells (those that secrete the gastric juice).

32 **Answer (A)**

(X) is the pancreas: its hormones (insulin and glucagon) affect the liver.

(Y) is the duodenum: its hormones (secretin) affect the duct part of the pancreas.