QUESTION 1

Steroids are **synthesized in the gonads (ovaries and testes) and adrenal cortex** from **cholesterol**

A. through progesterone as an intermediate

B. through Δ^5-pregnenolone as an intermediate

C. Through cortisol as an intermediate

D. Through estradiol as an intermediate

QUESTION 2

Conversion of steroid hormones to **less active or inactive forms involves alteration of ring substituents** rather than the ring structure itself.

A. Alteration of ring substituents

B. Alteration of the ring structure itself

C. Both alteration of ring substituents and the ring structure itself

D. None of the above

QUESTION 3

Cholesterol the precursor for adrenal steroidogenesis is

A. **Obtained from circulation**
B. **Generated de novo within the adrenal cortex from acetyl coenzyme A (CoA).**
C. **The adrenal can utilize high-density lipoprotein (HDL) cholesterol**
D. **All of the above**

QUESTION 4

Cholesterol the precursor for adrenal steroidogenesis can be obtained

A. from circulation

B. de novo within the adrenal cortex from acetyl coenzyme A (CoA).

C. the adrenal can utilize high-density lipoprotein (HDL) cholesterol

D. All of the above

QUESTION 5

The endoplasmic reticulum hydroxylases involved in steroid hormone synthesis

A. use molecular oxygen (O_2) to introduce one oxygen atom into the steroidal substrate (as an OH), while the second atom is reduced to water.

B. move the double bond from the B ring to the A ring to produce progesterone

C. detach an H from its molecule steroid. NAD is converted to NADH.

D. None of the above

QUESTION 6

Conversion of pregnenolone to aldosterone in the adrenal zona glomerulosa cells **requires**

A. **the endoplasmic reticulum 21-hydroxylase**
B. **11 β-hydroxylase located in mitochondria**
C. **18-hydroxylase located in mitochondria**
D. **All of the above**

QUESTION 7

To form cortisol, primarily in adrenal zona fasciculata cells is/are required,

A. **7-hydroxylase in the endoplasmic reticulum**
B. **21-hydroxylase in the endoplasmic reticulum**
C. **11-hydroxylase located in mitochondria**
D. **All of the above**

QUESTION 8

……. is the key enzyme for estrogen production in the ovary

A. 7-hydroxylase
B. 21-hydroxylase in the endoplasmic reticulum
C. Aromatase
D. 5a-reductase

QUESTION 9

Which of the following statements is correct about steroid metabolism

A. **Rapid metabolism**
B. **Age does not influence hepatic steroid metabolism**
C. **Slow metabolism**
D. **Estimates of steroid hormone secretion are not based on urinary metabolite levels.**

QUESTION 10

Reduction of testosterone το dihydrotestosterone a more potent androgen happens by

A. **21-hydroxylase**
B. **5a –reductase**
C. **17α-hydroxylase**
D. **3β-hydroxysteroid dehydrogenase type II**

QUESTION 11

What is correct from the following statements about StAR protein

A. **is specifically expressed in the liver**
B. **Patients with lipoid congenital adrenal hyperplasia express functional StAR proteins**
C. **facilitates translocation of cholesterol from the outer to the inner mitochondrial membranes**
D. **It is a glucoprotein**

QUESTION 12

7-dehydrocholesterol is activated in the skin by sunlight to generate

A. cortisol

B. aldosterone

C. cholesterol

D. vitamin D3

QUESTION 13

What is correct about cortisol

A. **Most of the circulating cortisol (75%- 80%) binds to a specific corticosteroid binding a2-globulin (CBG) known as transcortin.**
B. **About 95% of plasma cortisol is bound to albumin with a much lower affinity.**
C. **The concentration of transcortin decreases during pregnancy and after estrogen administration.**
D. **None of the above**

QUESTION 14

What is correct about testosterone

A. **65% of circulating testosterone is bound to a liver-derived glycoprotein called sex hormone-binding globulin (SHBG).**
B. **1 %- 2% is in the free form and the rest is bound to albumin and other proteins.**
C. **Estradiol bound to SHBG dissociates very rapidly, and it is taken up by target tissues.**
D. **All of the above**

QUESTION 15

Steroid receptors under basal conditions

A. **exist as cytoplasmic, multimeric complexes that include hormone response elements**

B. **exist in the nucleus**

C. **exist as cytoplasmic, multimeric complexes that include the heat shock proteins (HSPs) and immunophilins of the FK506 family**

D. **None of the above**

QUESTION 16

Type 1 nuclear receptors

A. **In the absence of ligand, the receptors are held in the cytoplasm in an inactive state by heat shock proteins**

B. **Ligand-binding inhibits the conformational change that causes the release of the heat shock proteins, nuclear translocation, and dimerization and association with chromatin at specific sequences of DNA termed hormone response elements (HREs)**

C. **In the presence of ligand, the receptors are held in the cytoplasm in an inactive state by heat shock proteins**

D. **None of the above**

QUESTION 17

All of the following are normal events leading to secretion of aldosterone from the adrenal gland except

A. renin is released by the kidney in hypovolemia

B. angiotensinogen binds to membrane receptors

C. Ca^{2+} levels in the cell rise

D. aldosterone is secreted into the blood

QUESTION 18

Which of the following hormones belongs to the C19 steroid group?

A) Progesterone

B) 17/β-estradiol

C) Testosterone

D) Cortisol

QUESTION 19

In the general reaction catalyzed by cytochrome P450, what serves as a two-electron donor?

A) Oxygen (O2)

B) NADPH

C) H+

D) SOH

QUESTION 20

Which enzyme(s) is/are responsible for converting Δ5-pregnenolone to progesterone in the synthesis of steroid hormones?

A) 3β-Dehydrogenase

B) Isocaproaldehyde

C) Δ 4,5-isomerase

D) 3β-Dehydrogenase and Δ ^{4,5}-isomerase

QUESTION 21

In the synthesis of estradiol, what enzyme is responsible for converting testosterone into estradiol?

A) 5a-reductase

B) 3β-Dehydrogenase

C) Aromatase

D) Δ 4,5-isomerase

QUESTION 22

Which of the following statements about steroid metabolism is correct?

A) Aldosterone has a longer plasma half-life than cortisol due to extensive binding to plasma proteins.

B) Enzymatic reactions involved in steroid metabolism increase biological activity and decrease solubility in water.

C) Conjugation of steroids with glucuronides and sulfates decreases water solubility, hindering their excretion in urine.

D) The clearance of some steroids is slower in patients with hyperthyroidism.

QUESTION 23

Which hormone is indispensable for ovulation, nidation of the fertilized egg, and the maintenance of pregnancy, and also inhibits the secretion of GnRH?

A) Estrogen

B) Testosterone

C) Cortisol

D) Progesterone

QUESTION 24

How are type I nuclear receptors activated and what is their typical response element in DNA called?

A) Activated by heat shock proteins, and they bind to HSP elements

B) Activated by ligand-binding, and they bind to nuclear translocation elements

C) Activated by progestagens, and they bind to progesterone response elements

D) Activated by cholesterol-derived steroidal hormones, and they bind to hormone response elements (HREs)

QUESTION 25

Which domain of steroid receptors contains two zinc fingers that recognize specific hormone response elements (HREs) in DNA and stabilizes binding to these sequences?

A) DNA-binding domain

B) Ligand-binding domain

C) Transcription activation region

D) Nuclear localization signal

QUESTION 26

What is the physiological significance of down-regulation of hormone receptors by their own ligands?

A) It increases receptor gene expression

B) It decreases the half-life of the receptor protein

C) It prevents overstimulation of target cells in the presence of elevated hormone levels

D) It enhances hormonal responsiveness in all target cells

QUESTION 27

How are the rapid, non-genomic effects of certain steroid hormones, such as aldosterone and 17β-estradiol, believed to be initiated in target cells?

A) Through direct interaction with DNA in the nucleus.

B) By binding to cytoplasmic heat shock proteins.

C) Activation of protein kinase A in the cytoplasm.

D) Initiation at the plasma membrane, either by membrane-localized nuclear receptors or distinct membrane receptors.

QUESTION 28

What is the primary cause of the apparent mineralocorticoid excess (AME) syndrome, characterized by hypertension, hypokalemia, and suppression of the renin-angiotensin-aldosterone system in some patients, particularly children?

A) Defects in the renin-angiotensin-aldosterone system genes

B) Overproduction of aldosterone

C) Mutations in the cortisol-binding proteins

D) Defects in the HSD11B2 gene, encoding 11β-hydroxysteroid dehydrogenase type 2 (11β-HSD2)

QUESTION 29

Which autosomal recessive disorder is characterized by insufficient cortisol production due to a deficiency in CYP21A2, resulting in the failure to metabolize 17α-hydroxyprogesterone to 11-deoxycortisol?

A) Congenital adrenal hyperplasia (CAH)

B) Cushing's syndrome

C) Addison's disease

D) Conn's syndrome

QUESTION 30

Which of the following is a common iatrogenic cause of Cushing syndrome?

A) Increased ACTH release

B) Ectopic ACTH secretion

C) Hyperplasia of CRH-secreting cells

D) Prolonged use of glucocorticoids