Course TEST 2

Status	Finished
Started	Monday, 26 January 2026, 9:07 AM
Completed	Monday, 26 January 2026, 9:45 AM
Duration	37 mins 42 secs
Grade	**53.0** out of 60.0 (**88.3**%)

Question 1

Correct

Mark 2.0 out of 2.0

Flag question

Fluorescently labeled phalloidin can be used for the visualization of microfilaments .

For separation of proteins employing SDS-PAGE method, the gel made of polyacrylamide is routinely used.

Your answer is correct.

The correct answer is:
Fluorescently labeled phalloidin can be used for the visualization of [microfilaments].

For separation of proteins employing SDS-PAGE method, the gel made of [polyacrylamide] is routinely used.

Question 2

Partially correct

Mark 4.0 out of 5.0

Flag question

Histology question

Select the best correct answer

Osteoid is basophilic component of bone matrix. , which is synthesized by osteoblasts. .

Osteoclasts contain numerous lysosomes.

Compact bone has osteocytes localised between lamellae. .

During desmogenic ossification Osteoblasts differentiate from mesenchymal tissue. .

Vaše odpověď je částečně správná.

You have correctly selected 4.

The correct answer is:
Histology question

Select the best correct answer

Osteoid is [non-mineralized bone matrix], which is synthesized by[osteoblasts.].

Osteoclasts[contain numerous lysosomes.]

Compact bone [has osteocytes localised between lamellae.].

During desmogenic ossification [Osteoblasts differentiate from mesenchymal tissue.].

Question 3

Correct

Mark 5.0 out of 5.0

Flag question

Histology question

Assign the characteristic that best corresponds to the given cell type.

Myoepithelial cell	Contains contractile fibers.
Osteocyte	It differentiates from osteoblast.
Chondrocyte	It form isogenous groups.
Enterocyte	It has microvilli on its apical surface.
Serous cell	Contains numerous secretory vesicles.

Vaše odpověď je správná.

The correct answer is: Myoepithelial cell → Contains contractile fibers., Osteocyte → It differentiates from osteoblast., Chondrocyte → It form isogenous groups., Enterocyte → It has microvilli on its apical surface., Serous cell → Contains numerous secretory vesicles.

Question 4

Correct

Mark 5.0 out of 5.0

Flag question

BIOCHEMISTRY question

KETOGENESIS - complete the basic facts about this metabolic pathway:

- it is the *synthesis of so-called ketone bodies*, which takes place in the liver
- its enzymes are localized in the matrix of mitochondria
- the substrate of this synthesis is acetyl-CoA and the first synthesized ketone body ("1st product") is acetoacetate
- reduction of this 1st product by beta-hydroxybutyrate dehydrogenase produces beta-hydroxybutyrate
- the first synthesized ketone body is an unstable beta-ketoacid and spontaneously *(= non-enzymatically)* decarboxylates to form acetone
- the ratio* of *beta-hydroxybutyrate / acetoacetate* concentrations depends on the ratio of *NADH / NAD^+* in the cell: the higher the ratio of these coenzymes, the higher the ratio* of the aforementioned ketone bodies, i.e. the more of beta-hydroxybutyrate

Vaše odpověď je správná.

The correct answer is:
BIOCHEMISTRY question

KETOGENESIS - complete the basic facts about this metabolic pathway:

- it is the *synthesis of so-called ketone bodies*, which takes place [in the liver]
- its enzymes are localized in the [matrix of mitochondria]
- the substrate of this synthesis is [acetyl-CoA] and the first synthesized ketone body ("1st product") is [acetoacetate]
- reduction of this 1st product by [beta-hydroxybutyrate dehydrogenase] produces [beta-hydroxybutyrate]
- the first synthesized ketone body is an unstable [beta-ketoacid] and spontaneously *(= non-enzymatically)* decarboxylates to form [acetone]
- the ratio* of *beta-hydroxybutyrate / acetoacetate* concentrations depends on the ratio of *NADH / NAD^+* in the cell: the higher the ratio of these coenzymes, the [higher] the ratio* of the aforementioned ketone bodies, i.e. the more of [beta-hydroxybutyrate]

Question 5

Partially correct

Mark 3.0 out of 5.0

Flag question

Genetics, calculation

The one of monogenically inherited disorder of lipid metabolism is a disorder of endogenous cholesterol production, called Lynch syndrome . Patients have non-functional 7-dehydrocholesterol reductase , complex whole-body disability and mental retardation. The inheritance of this disease is autosomal recessive and patients are treated with statins and high-cholesterol food to replenish the formation of intermediates. The frequency of this disease in the Czech Republic is **1:20,000**, i.e. the frequency of heterozygotes in the Czech Republic is 0.014 = 1:71 (every seventy-one) .

Your answer is partially correct.

You have correctly selected 3.

The correct answer is:
Genetics, calculation

The one of monogenically inherited disorder of lipid metabolism is a disorder of endogenous cholesterol production, called [Smith-Lemli-Opitz syndrome]. Patients have non-functional [7-dehydrocholesterol reductase], complex whole-body disability and mental retardation. The inheritance of this disease is [autosomal recessive] and patients are treated with statins and high-cholesterol food to [inhibit by feedback] the formation of intermediates. The frequency of this disease in the Czech Republic is **1:20,000**, i.e. the frequency of heterozygotes in the Czech Republic is [0.014 = 1:71 (every seventy-one)].

Question 6

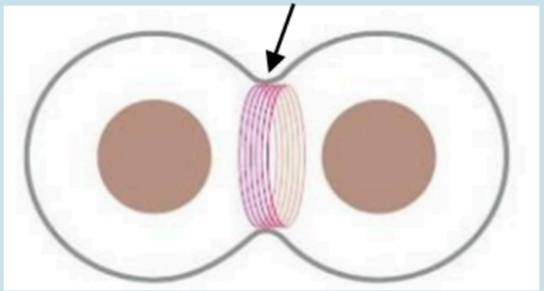
Complete

Mark 2.0 out of 3.0

Flag question

1) The autosomal recessive disorder Primary ciliary dyskinesia (PCD), also called Kartagener syndrome in certain circumstances, is manifested, among other things, by infertility in men due to poor sperm motility. A malfunction of which molecular motor is the cause?

2) The picture shows a dividing cell. A) What is the name of the structure marked in red that is involved in the process of membrane constriction? B) What molecular motors are part of this structure?



3) Molecular motors are responsible for transporting organelles along microtubules. Which molecular motor transports its cargo along microtubules towards the periphery of the cell?

1. Dynein
2. A. Contractile Ring
   B. Myosin
3. Dynein

Comment:

Question 7

Correct

Mark 5.0 out of 5.0

Flag question

BIOCHEMISTRY question

Always choose the BEST option

Assign each enzyme to the carbohydrate metabolic pathway in which it occurs:

phosphoenolpyruvate carboxykinase	in gluconeogenesis
fructokinase	in fructolysis
transaldolase	in pentose cycle
pyruvate carboxylase	in gluconeogenesis
aldolase B	in fructolysis
galactose-1-phosphate uridyltransferase	in galactose metabolism
4-epimerase	in galactose metabolism
glycogen phosphorylase	in glycogenolysis
fructose-1,6-bisphosphatase	in gluconeogenesis
glucose-6-phosphate dehydrogenase	in pentose cycle

Vaše odpověď je správná.

The correct answer is: phosphoenolpyruvate carboxykinase → in gluconeogenesis, fructokinase → in fructolysis, transaldolase → in pentose cycle, pyruvate carboxylase → in gluconeogenesis, aldolase B → in fructolysis, galactose-1-phosphate uridyltransferase → in galactose metabolism, 4-epimerase → in galactose metabolism, glycogen phosphorylase → in glycogenolysis, fructose-1,6-bisphosphatase → in gluconeogenesis, glucose-6-phosphate dehydrogenase → in pentose cycle

Question 8

Partially correct

Mark 4.0 out of 5.0

Flag question

BIOCHEMISTRY question

When the heart is deprived of its oxygen supply, the mitochondrial electron transport (ETC) is inhibited, resulting in the decline of cellular levels of ATP and creatine phosphate. As cellular ATP levels diminish, anaerobic glycolysis is activated, glycogen is rapidly depleted and lactic acid levels increase. Hypoxic cells in such an energy deficit begin to swell: they increase their volume by sucking water inside. The cell membranes of swollen cells become more permeable, leading to the leakage of various soluble cell constituents from the cell. In case of cardiomyocytes, constituents as troponins or creatine kinase can be detected in blood as laboratory markers of myocardial infarction.

Always choose the BEST option:

UNDER ABOVE-MENTIONED CONDITIONS.....

The ETC is inhibited because [the final electron acceptor is missing] ✓ .

Cellular levels of ATP decline because [the inner mitochondria membrane potential is not sufficient] ✓ .

Creatine phosphate levels decline because [an intracellular ATP level is lowered] ✓ .

Anaerobic glycolysis is activated because it is the only metabolic pathway [that itself regenerates necessary enzyme cofactors] ✓ .

Glycogen stored in cardiomyocytes is depleted as it provides the substrate for anaerobic glycolysis - the degradation of this substrate leads to the net gain of [2 ATP] ✗ .

Lactic acid level increases because its formation is coupled with [conversion of NADH to NAD+] ✓ .

Hypoxic cells swell due to [the accumulation of glucose in mitochondria] ✗ that leads to [an accumulation of sodium cations] ✓ as well as of water within the cell.

Troponins of cardiomyocytes are involved in [regulation of muscle contraction] ✓ .

Creatine kinase catalyzes this reaction: [creatine + ATP = creatine phosphate + ADP] ✓ .

Your answer is partially correct.

You have correctly selected 8.

The correct answer is:
BIOCHEMISTRY question

When the heart is deprived of its oxygen supply, the mitochondrial electron transport (ETC) is inhibited, resulting in the decline of cellular levels of ATP and creatine phosphate. As cellular ATP levels diminish, anaerobic glycolysis is activated, glycogen is rapidly depleted and lactic acid levels increase. Hypoxic cells in such an energy deficit begin to swell: they increase their volume by sucking water inside. The cell membranes of swollen cells become more permeable, leading to the leakage of various soluble cell constituents from the cell. In case of cardiomyocytes, constituents as troponins or creatine kinase can be detected in blood as laboratory markers of myocardial infarction.

Always choose the BEST option:

UNDER ABOVE-MENTIONED CONDITIONS.....

The ETC is inhibited because [the final electron acceptor is missing].

Cellular levels of ATP decline because [the inner mitochondria membrane potential is not sufficient].

Creatine phosphate levels decline because [an intracellular ATP level is lowered].

Anaerobic glycolysis is activated because it is the only metabolic pathway [that itself regenerates necessary enzyme cofactors].

Glycogen stored in cardiomyocytes is depleted as it provides the substrate for anaerobic glycolysis - the degradation of this substrate leads to the net gain of [3 ATP].

Lactic acid level increases because its formation is coupled with [conversion of NADH to NAD+].

Hypoxic cells swell due to [the lack of ATP in cytosol] that leads to [an accumulation of sodium cations] as well as of water within the cell.

Troponins of cardiomyocytes are involved in [regulation of muscle contraction].

Creatine kinase catalyzes this reaction: [creatine + ATP = creatine phosphate + ADP].

Question 9

Partially correct

Mark 3.0 out of 5.0

Flag question

Histology question

Choose the BEST correct answer

Which types of muscle cells contain actin and myosin: all three types ✓ .

Dense bodies are part of intecalated discs ✗ .

Which type of connection is typical for the functional connection of smooth muscle cells gap junctions ✓ .

Cross-striation occurs in cardiac muscle only ✗ .

The T tubule is an invagination of the plasma membrane of muscle cells ✓ .

Your answer is partially correct.

You have correctly selected 3.

The correct answer is:
Histology question

Choose the BEST correct answer

Which types of muscle cells contain actin and myosin: [all three types].

Dense bodies [anchor actin in smooth muscle cells].

Which type of connection is typical for the functional connection of smooth muscle cells [gap junctions].

Cross-striation occurs [in skeletal and cardiac muscle].

The T tubule [is an invagination of the plasma membrane of muscle cells].

Question 10

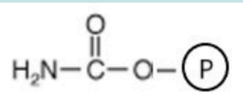
Correct

Mark 5.0 out of 5.0

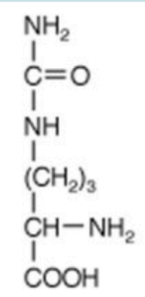
Flag question

BIOCHEMISTRY question

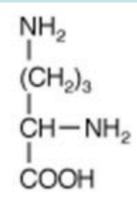
All the listed molecules originate from the same metabolic pathway. Based on the knowledge of the course of this metabolic pathway, assign the correct characteristic to each molecule.



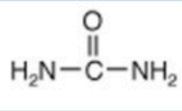
product of regulatory reaction of the urea cycle



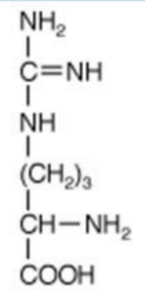
formed in reaction of ornithine with carbamoyl phosphate



amino acid formed in reaction catalyzed by arginase



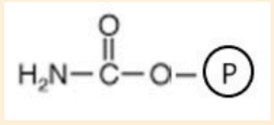
final waste product of ammonia metabolism

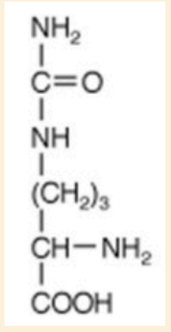


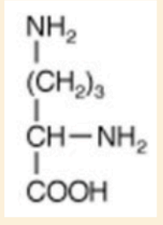
hydrolyzed in ornithine cycle to urea and ornithine

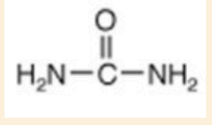
Your answer is correct.

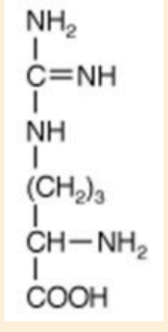
The correct answer is:

 → product of regulatory reaction of the urea cycle,

 → formed in reaction of ornithine with carbamoyl phosphate,

 → amino acid formed in reaction catalyzed by arginase,

 → final waste product of ammonia metabolism,

 → hydrolyzed in ornithine cycle to urea and ornithine

Question 11

Correct

Mark 5.0 out of 5.0

Flag question

Histology question

Select the best correct answer

Which cell is most represented in the differential count of white blood cells? neutrophil .

Which cell type has cytoplasmic granules containing heparin and histamine? basophil .

Granulocytes do not include monocyte .

Which statement about leukocytes is correct? Some leukocytes are able to leave the bloodstream through a process called diapedesis. .

Which of the following statements about erythrocytes is correct? Hemoglobin is strongly eosinophilic. .

Vaše odpověď je správná.

The correct answer is:
Histology question

Select the best correct answer

Which cell is most represented in the differential count of white blood cells? [neutrophil].

Which cell type has cytoplasmic granules containing heparin and histamine? [basophil].

Granulocytes do not include [monocyte].

Which statement about leukocytes is correct? [Some leukocytes are able to leave the bloodstream through a process called diapedesis.].

Which of the following statements about erythrocytes is correct? [Hemoglobin is strongly eosinophilic.].

Question 12

Correct

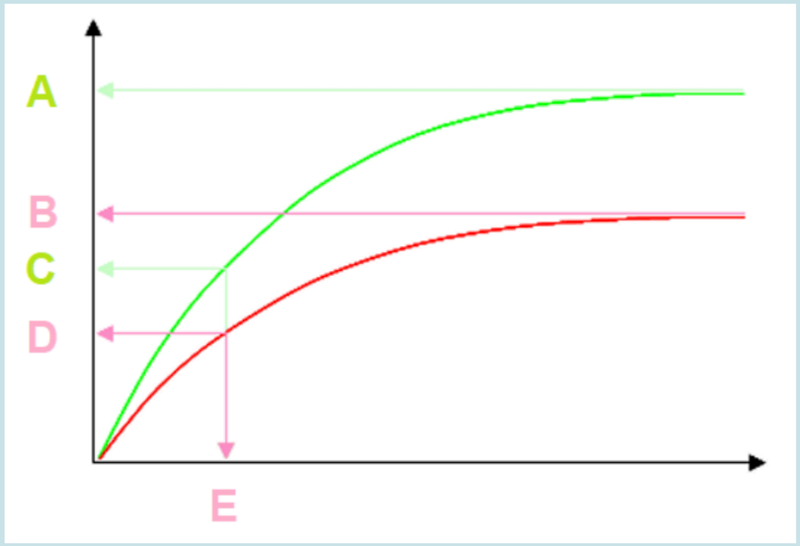
Mark 5.0 out of 5.0

Flag question

BIOCHEMISTRY question

Always choose the BEST option

The graph in the picture concerns enzyme kinetics: *complete the description of this graph*



Description of graph axes: on the "x" axis is substrate concentration , on the "y" axis is reaction velocity

One of the curves shows the behavior of the enzyme alone, the second curve describes the same enzyme in the presence of an inhibitor:

- the shape of both curves is hyperbolic
- point A is Vmax without an inhibitor , point B is Vmax with an inhibitor
- point C is 1/2 Vmax without an inhibitor , point D is 1/2 Vmax with an inhibitor
- point E shows for both curves the value of Michaelis constant , which corresponds to enzyme affinity to substrate
- from the above it follows that it is non-competitive inhibition

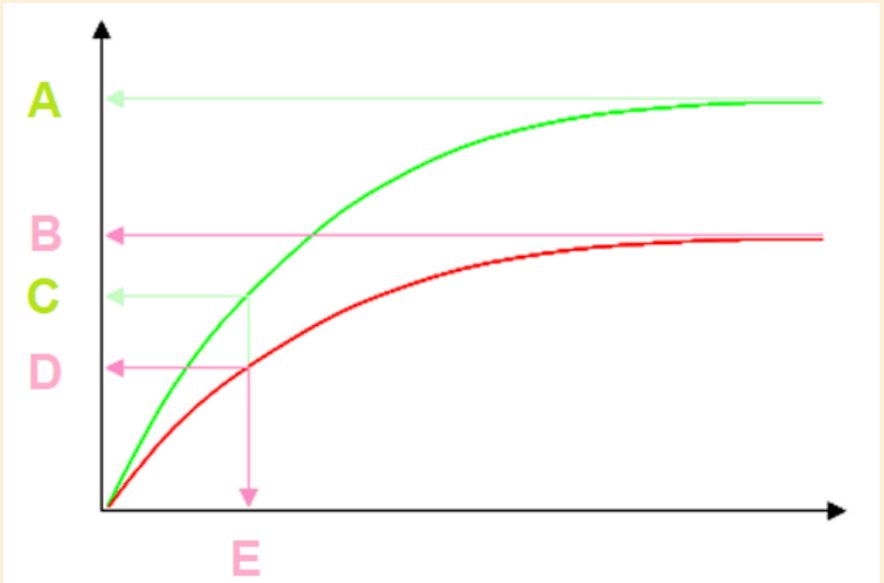
Vaše odpověď je správná.

Non-competitive inhibition of an enzyme means that the *inhibitor does not compete with the substrate* for the enzyme, but only puts some of the enzyme molecules "out of commission" (inactivates the enzyme). This *reduces the maximum reaction velocity (Vmax)* in the presence of the inhibitor, which depends on the concentration of the active enzyme. The *Michaelis constant (Km) does not change*, the remaining active enzyme molecules still have the same affinity for the substrate. But because of the lower concentration of the active enzyme, the enzyme-catalyzed reaction will proceed more slowly - the inhibitor has slowed down the reaction (which an inhibitor always does).

The correct answer is:
BIOCHEMISTRY question

Always choose the BEST option

The graph in the picture concerns enzyme kinetics: *complete the description of this graph*



Description of graph axes: on the "x" axis is [substrate concentration], on the "y" axis is [reaction velocity]

One of the curves shows the behavior of the enzyme alone, the second curve describes the same enzyme in the presence of an inhibitor:

- the shape of both curves is [hyperbolic]
- point A is [Vmax without an inhibitor], point B is [Vmax with an inhibitor]
- point C is [1/2 Vmax without an inhibitor], point D is [1/2 Vmax with an inhibitor]
- point E shows for both curves the value of [Michaelis constant], which corresponds to [enzyme affinity to substrate]
- from the above it follows that it is [non-competitive] inhibition

Question 13

Correct

Mark 5.0 out of 5.0

Flag question

Histology question

Select the best correct answer

Glandula parotis is serous gland.

Cells producing its secret (saliva) are arranged into serous acini, which have small lumen.

Saliva are transported from the gland with ducts.

Striated ducts belong to intralobular ducts.

Vaše odpověď je správná.

The correct answer is:
Histology question

Select the best correct answer

Glandula parotis is [serous] gland.

Cells producing its secret (saliva) are arranged into [serous acini], which have [small] lumen.

Saliva are transported from the gland with [ducts].

Striated ducts belong to [intralobular] ducts.