NAME ⇒ MUHAMMAD ZAHID

Department ⇒ RADIOLOGY

SEMESTE ⇒ 2ND th Second

ID NO ⇒ 16679

PAPER ⇒ BIOCHEMISTRY

SUBMITTED TO

NAM

KALSOOM ZIA

# Q no 1 Answers

## Uric Acid :-

Uric acid is a waste byproduct. It's formed when your body break down purines, which are found in some foods. Most of the uric acid leaves your body when pee, and some when you poop. If you have high levels of uric acid, it can be a sign of disease such as gout.

## Uric Acid Formations :-

The formation of uric acid is through the enzyme xanthine oxidase which oxidizes oxypurines. Normally a small amount of uric acid is present in the body, but when there is an excess amount in blood called hyperuricemia, this can lead to gout and formation of kidney stones.

Q.No2 * ANSWERS

# Significance of Alkaline Phosphatase

(ALP) is an enzyme in a person's blood that helps break down proteins. The body uses ALP for a wide range of processes and it plays a particularly important role in liver function and bone development. The majority of sustained elevated ALP level are associated with disorders of the liver or bone or both. Since production is increased in response to cholestasis serum ALP activity provide a sensitive indicator of obstructive obstructive Eg space occupying lesions of the liver.

## CREATINE KINASE

Thus creatine kinase is an important enzyme in such tissue. Clinically creatine kinase is assayed in blood tests as a marker of damage of CK-rich tissue such as in myocardial infarction (heart attack) rhabdomyolysis (severe muscle breakdown), muscular dystrophy, autoimmune myositides, & acute kidney injury.

## GAMMA-Glutamyl Transferase

(GGT) is primarily present in kidney, liver, and pancreatic cells. Small amounts are present in other tissues. Even though renal tissue has the highest level GGT, the enzyme present in the serum appears to originate primarily from the hepatobiliary system, and GGT activity is elevated in any and all forms of liver disease. It is highest in cases of intra or posthepatic biliary obstruction, reaching levels some

## CREATINE KINASE

Thus creatine kinase is an important enzyme in such tissue. Clinically creatine kinase is assayed in blood tests as a marker of damage of CK-rich tissue such as in myocardial infarction (heart attack) rhabdomyolysis (severe muscle breakdown), muscular dystrophy, autoimmune myositides, & acute kidney injury.

## GAMMA-Glutamyl Transferase

(GGT) is primarily present in kidney, liver, and pancreatic cells. Small amounts are present in other tissues. Even though renal tissue has the highest level GGT, the enzyme present in the serum appears to originate primarily from the hepatobiliary system, and GGT activity is elevated in any and all forms of liver disease. It is highest in cases of intra or posthepatic biliary obstruction, reaching levels some

5 to 30 times normal. GGT is more sensitive than alkaline phosphatase (ALP) Leucine aminopeptidase aspartate.

## Q no 3 Answer

### Protein in Election Transport Chain :-

The election transport chain is a series of four protein complexes that couple redox reactions, creating an electrochemical gradient that leads to the creations of ATP in complete system named oxidative phosphorylation. It occurs in mitochondria in both cellular respiration and photosynthesis.

NADH dehydrogenase, cytochrome b-c1, cytochrome oxidase, & the complex that makes ATP, ATP synthase. In addition to these complexes, also involved: ubiquinone & cytochrome c.

# Electrons Move Electrons Transport Chains

The electron transport chain and ATP synthase are embedded in the inner mitochondrial membrane. The electron flow through the electron transport chain causing protons to be pumped from matrix to the intermembrane space. Eventually the electrons are passed to oxygen which combines with protons to form water.

1:- Redox of NADH + H+ at Complex I
* electrons go to complex I four protons pumped from matrix to intermembrane space.

2:- Redox of $FADH_2$ at comple II :-
* Coenzyme Q picks up electrons (from Complex I & II) & transport to Complex III.

3):- Redox of Complex III
four protons pumped from matrix to intermembrane space carries ( transport electrons to complex IV.

4:- Redox of Complex IV
* Two protons pumped from matrix to intermembrane space formation of $H_2O$ (20% of water in body

5:- ATP Synthase Action *
* pumps protons from intermembrane space to matrix produces ATP from ADP + Pi + energy.

## Q no 4 Answers

### Steps of Beta Oxidations

1:- Dehydrogenation of the fatty acyl - CoA to make a trans double bond between α & β carbon
* Short, medium, and long chain acyl CoAdehydrogenase
* e⁻ removed transferred to FAD.

2* Hydration of the double bond

1* Dehydrogenation of the

β-hydroxyl group to a ketone é removed transferred to $NAD^+$

4* Acylation - addition of CoA and production of acetyl-CoA.

⇒ (C16) $R-CH_2-\overset{\beta}{CH_2}-\overset{\alpha}{CH_2}-C(=O)-S-CoA$ Palmitoyl CoA

acyl-CoA dehydrogense ↓ FAD → $FADH_2$ Step 1

⇒ $R-CH_2-\underset{H}{C}=\underset{H}{C}-C(=O)-S-CoA$ trans-$\Delta^2$-Enoyl-CoA

enyl-CoA hydrates ↓ $H_2O$ Step 2

⇒ $R-CH_2-\underset{H}{\overset{OH}{C}}-CH_2-C(=O)-S-CoA$ L-β hydroxy acyl-CoA

⊗ β-hydroxyacyl-CoA dehydrogenase ↓ $NAD^+$ → $NADH + H^+$ Step 3

⇒ $R-CH_2-C(=O)-CH_2-C(=O)-S-CoA$ β-ketoacyl CoA.

⊗ acyl-CoA acetyltransferase thiolase ↓ CoA-SH Step 4

⇒ (C14) $R-CH_2-C(=O)-S-CoA$ + $CH_3-C(=O)-S-CoA$ Acetyl-CoA

(C14) Acyl-CoA (myristoyl-CoA)

10

# Q No 5 (Answers)

Uric acid is a heterocyclic compound of carbon hydrogen with the formula $C_5H_4N_4O_3$. It forms ions and salts known as urates and acid urates such as ammonium acid urate. Uric acid is a product of the metabolic breakdown of purine nucleotides and it normal component of urine. High blood concentrations of uric acid can lead to gout and are associated with other medical conditions including diabetes & the formation of ammonium acid urate kidney stone.

IUPAC NAME :-

7, 9 - Dihydro - 1H - purine - 2, 6, 8 (3H) - trione

## Properties :-

Chemical formula :- $C_5H_4N_4O_3$

Molar Mass 168.112 g-mol$^{-1}$

Appearance White crystals

Melting point 300°C (572°F, 573 K)

Solubility in Water 6 mg/100 mL at 20°C

Xanthine oxidase is an enzyme which catalyzes the formation of uric acid from xanthine and hypoxanthine, which in turn are produced from other purines. Xanthine oxidase is large enzymes whose active site consist of the metal bound sulfur and oxygen.