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Section : B

Q1

Ans,

uric acid formation steps

uric acid production and metabolism are complex processes involving factors that ~~regulate~~ regulate hepatic production, as well as renal and gut excretion of this compound. uric acid is the end product of an exogenous pool of purines and endogenous purine metabolism.

The exogenous pool varies significantly with diet, and animal proteins contribute significantly to this purine pool.

p. f. o

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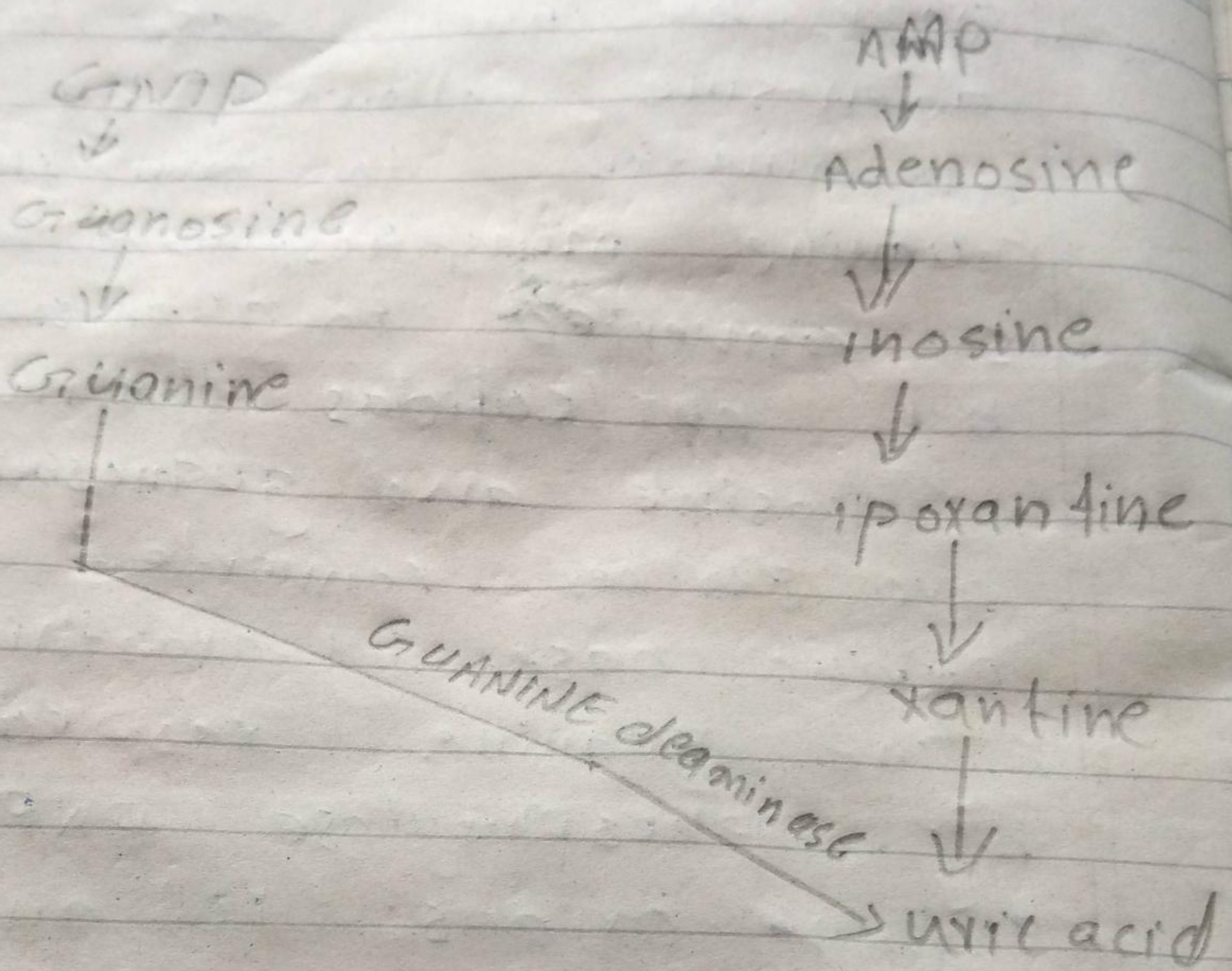
The endogenous production of uric acid is mainly from the liver, intestines and other tissues like muscles, kidneys and the vascular endothelium.

Uric acid is a $C_5H_4N_4O_3$ heterocyclic organic compound with a molecular weight of 168 Da. Many enzymes are involved in the conversion of the two purine nucleic acids, adenine monophosphate (AMP) converted to inosine via two different mechanisms either first removing an amino group by deaminase to form inosine monophosphate (IMP) followed by dephosphorylation with nucleotidase to form inosine or by first remove

(3)

group by nucleotidase to form adenosine followed by deamination to form inosine. Guanine monophosphate (GMP) is converted to guanosine by nucleotidase. The nucleosides inosine and guanosine are further converted to purine base hypoxanthine and guanine respectively by phosphorylase (PNP). Hypoxanthine-oxidase (XO) and guanine is deaminated to xanthine by guanine deaminase. Xanthine is again oxidized by xanthine oxidase to form the final product uric acid.

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01/02
Ans

Clinical significance:-

(1) Alkaline phosphatase:-

The majority of sustained elevated ALP levels are associated with disorders of the liver or bone or both. Since production is increased in response to cholestasis serum ALP activity provides a sensitive indicator of obstructive and space-occupying lesions of the liver.

(2) Creatine kinase:-

Thus creatine kinase is an important enzyme

in such tissues. 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) muscular
 dystrophy, autoimmune
 myositis and
 acute kidney injury.

③ Gamma glutamyl transferase

The gamma-glutamyl
 transferase (GGT)
 test may be used to
 determine the cause
 of elevated alkaline
 phosphatase (ALP).
 Both ALP and GGT
 are elevated

(7)

im disease of the
bile ducts and im
same Liver disease
but only p.p. ALP
will be elevated
im bone disease.

γ -GT

Functions

- ⇒ peptide and protein synthesis
- ⇒ Regulate tissue glutathione level
- ⇒ Transport Amino acid across the cell membrane.

Q3

ANS

protein are involve in electron transport chain

Composition of electron Transport Chain

There are four large ~~prop~~ protein complexes.

Complex I:-

== == NADH - coenzyme Q reductase.

Complex II:-

== == Succinate - coenzyme Q reductase.

Complex: III

== == cytochrome c reductase.

Complex IV

== == cytochrome c oxidase.

many of the components are
proteins with prosthetic groups
to move electrons.

electron transport chain
electron flow with
following two methods.

① Electron flow downhill:

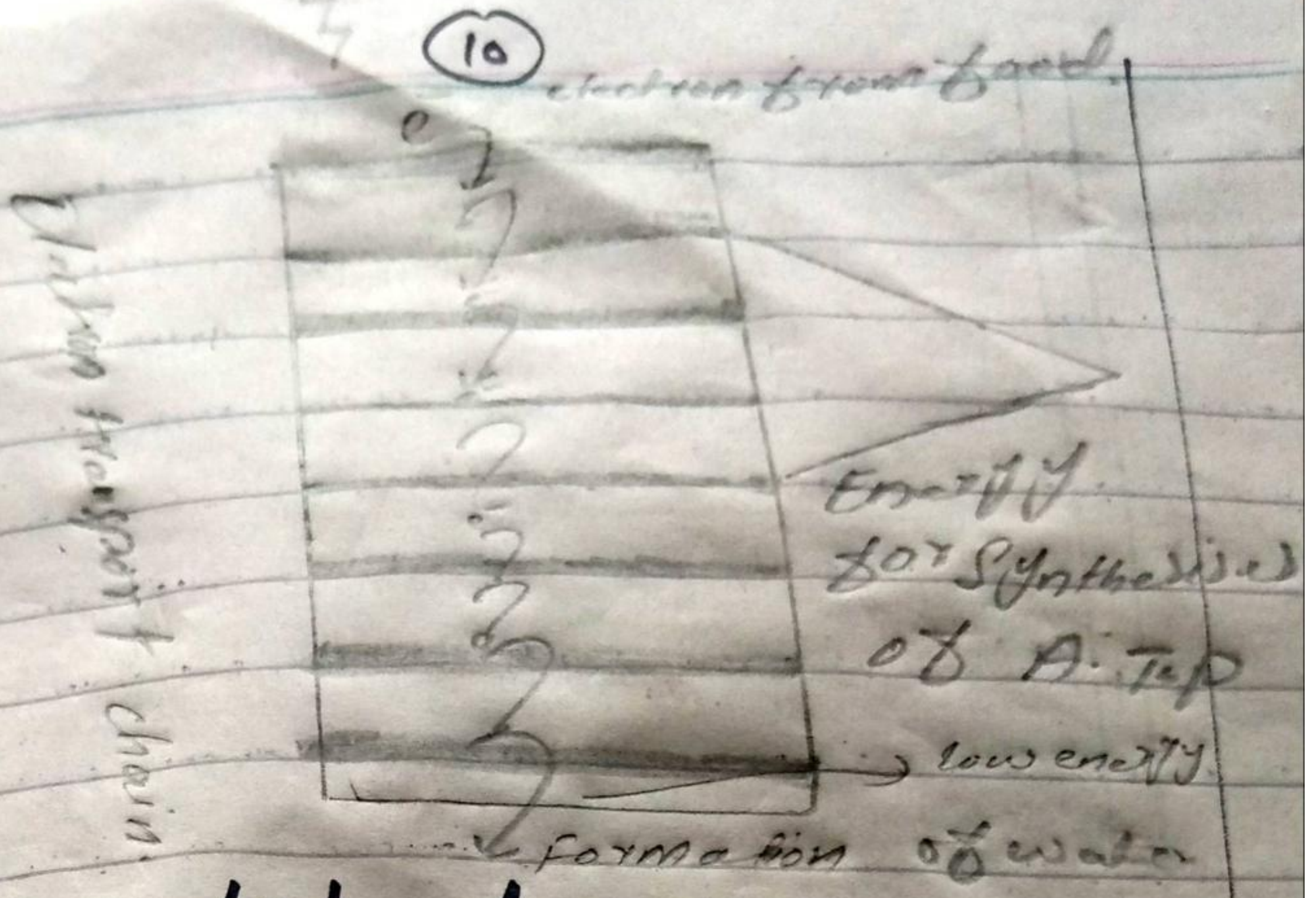
* Electrons move in
steps from carrier
to carrier downhill

to O_2

→ each carrier more
electronegative

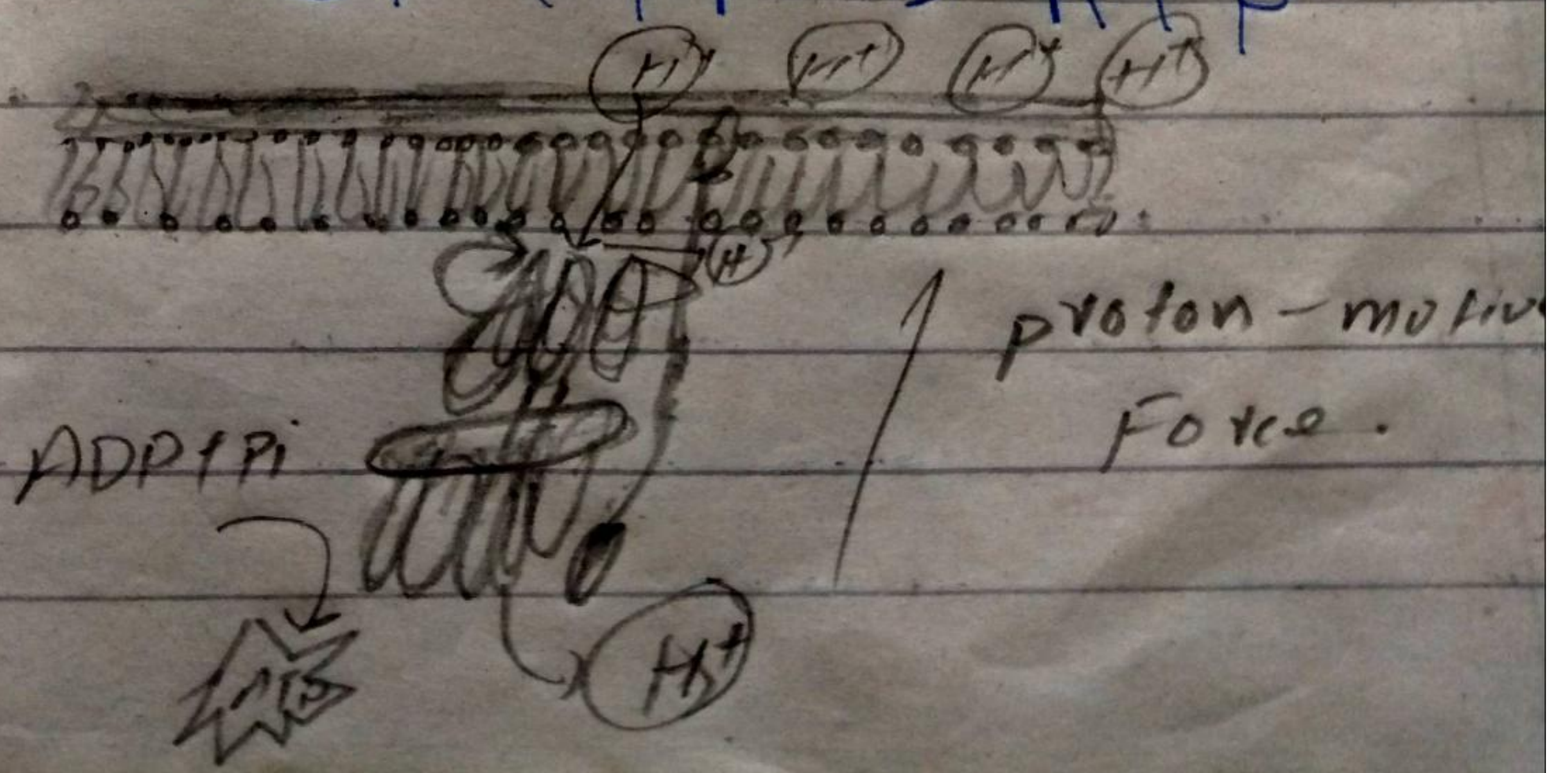
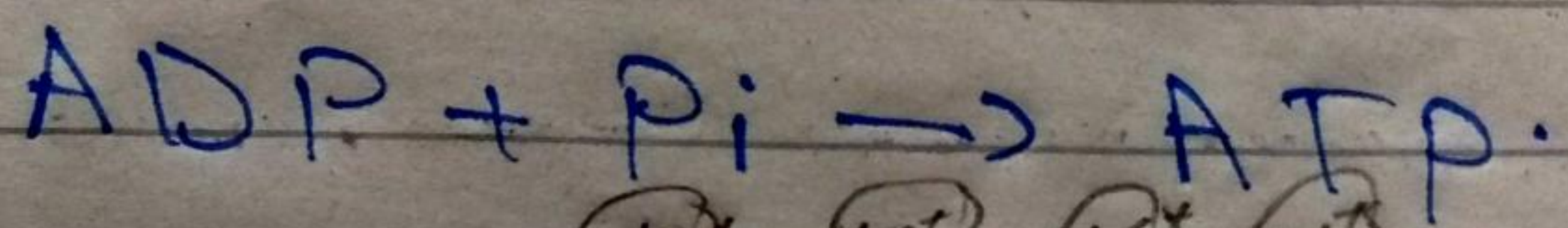
⇒ controlled oxidation

⇒ controlled release
of energy.



② we did it:-
 == == ==

- * set up a H^+ gradient
- * Allow the protons to flow through ATP Synthase.
- * synthesizes ATP.



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Q4

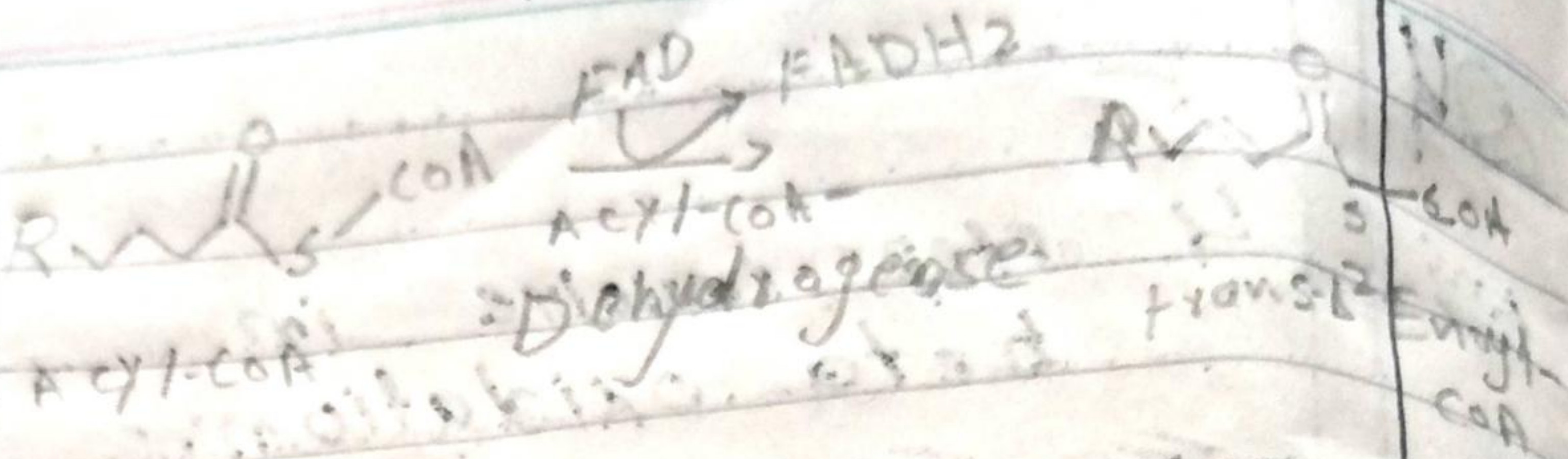
Ans

4 step involve in
beta oxidation:-

Beta oxidation takes
place in four steps.
dehydrogenation - hydration
oxidation and thiolysis.

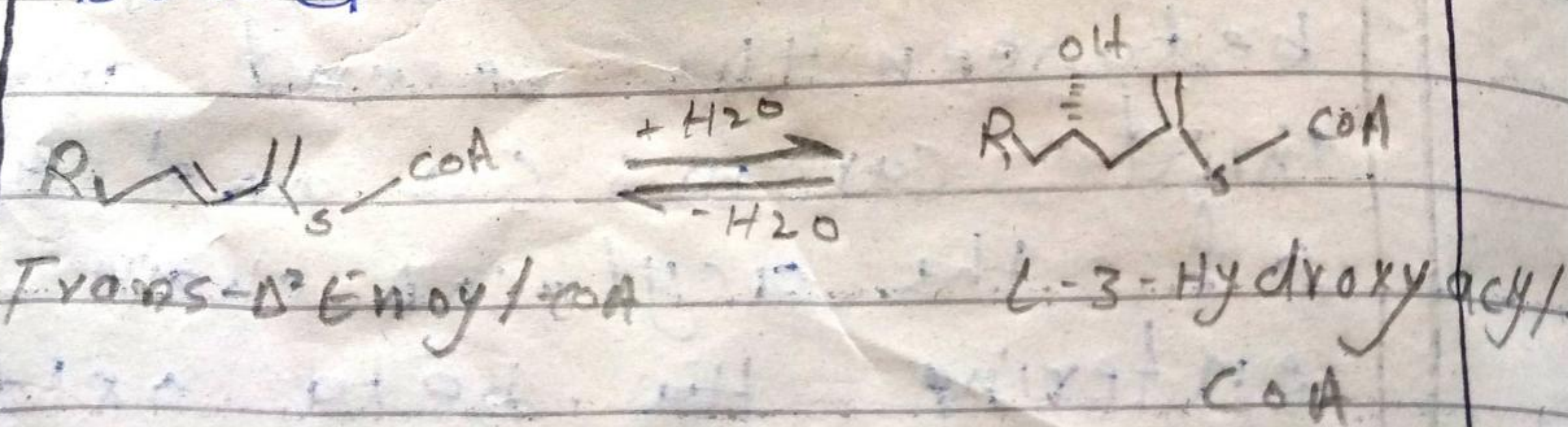
(1) Dehydrogenation:-

in the first step
acyl-CoA is oxidized
by the enzyme acyl
CoA dehydrogenase.
A double bond is formed
between the second and
third carbons (C2 and C3)
of the acyl-CoA chain
entering the beta oxidation
cycle.



(2) Hydration:-

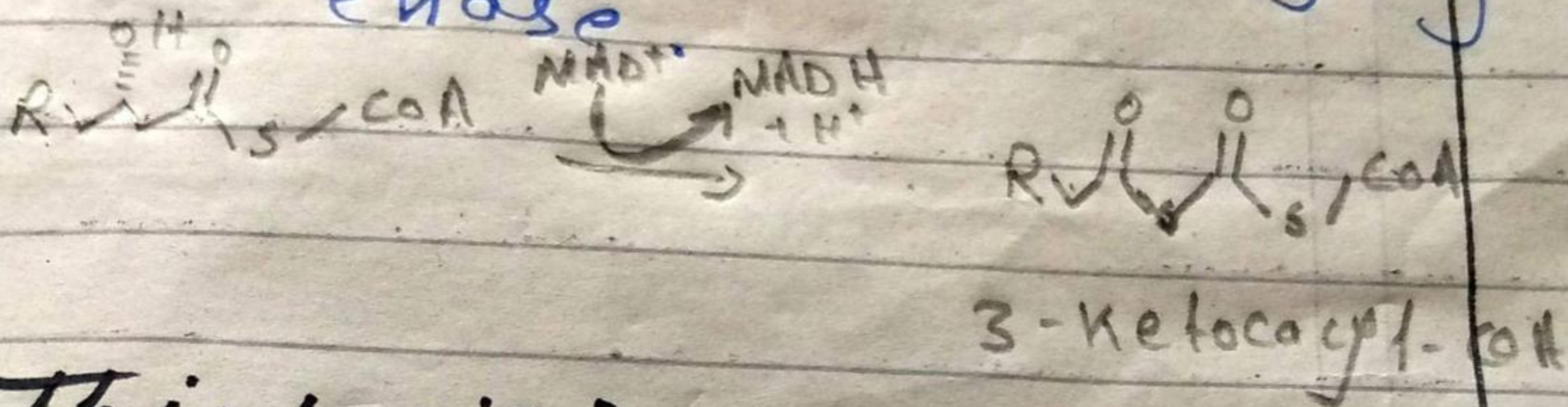
$\text{C}_2 = \text{C}_3$ in the second step the double bond between C_2 and C_3 of trans- Δ^2 -enoyl-CoA is hydrated forming the enol product L- β -hydroxyacyl-CoA, which has a hydroxyl group (-OH) in C_2 in place of the double bond.



oxidation:-

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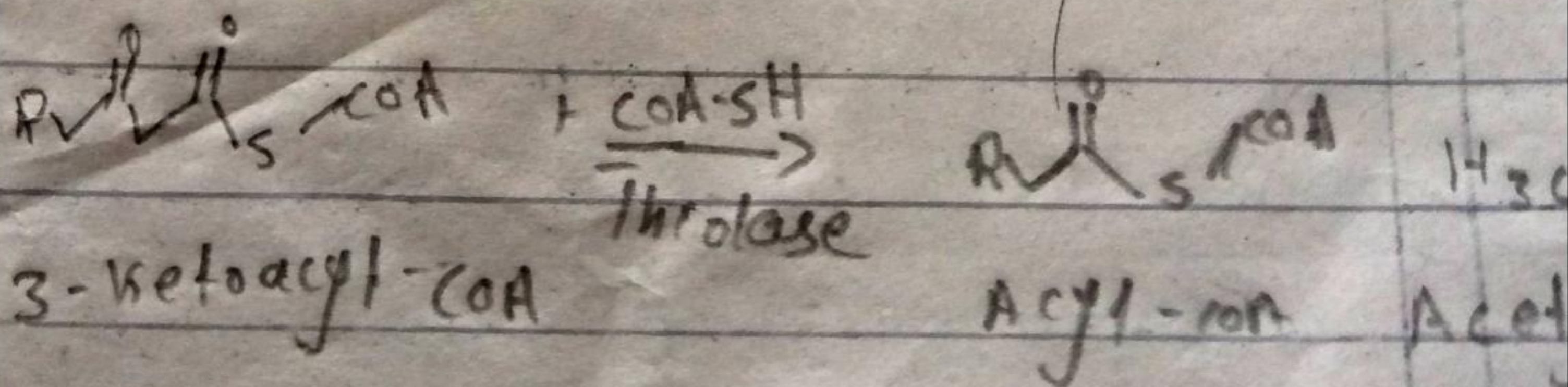
in the third step the hydroxyl group in C2 of L-β hydroxyacyl CoA is oxidized by NAD⁺ in a reaction that is catalyzed by 3 hydroxyacyl-CoA dehydrogenase



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Thiolysis:-

In the fourth step β-ketoacyl CoA is cleaved by a thiol group (SH) of another CoA molecule (CoA-SH). The enzyme that catalyzes this reaction is β-ketothio



QsAns

uric acid formation:-

uric acid is a heterocyclic compound of carbon nitrogen oxygen and 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.

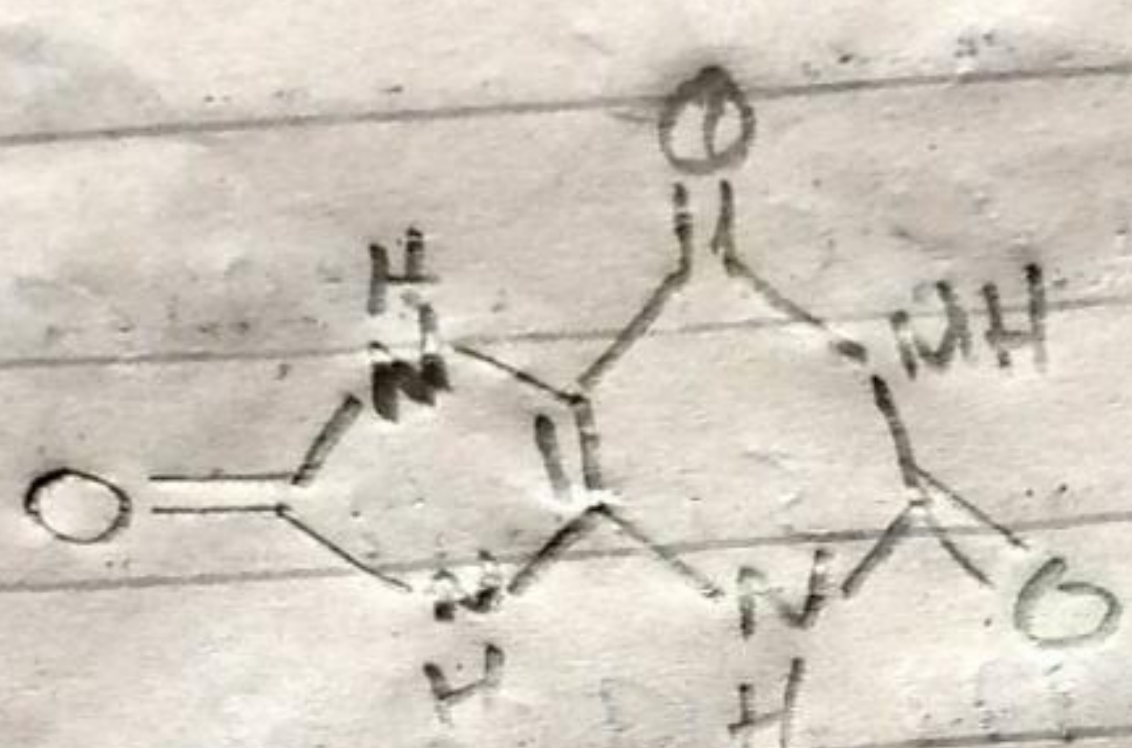
uric acid is product of the metabolic breakdown of purine nucleotides and it is a normal component of urine. ~~uric acid can lead to gout and~~

High blood concentration of uric acid can lead to gout.

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and are associated with other medical conditions, including diabetes and the formation of ammonium acid urate kidney stone.

uric acid



Systematic IUPAC NAME:-

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

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Normal uric acid levels
of human body.

Female:-

2.4 - 6.0
mg/dL

Male:-

3.4 - 7.0 mg/dL

Normal values will
vary from laboratory
to laboratory.

Also important to
blood uric acid levels
are purines.

END