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Notes for B.Sc part 3rd paper-V.

Q(1) Write Notes on Glycolysis?

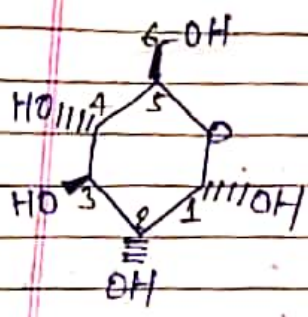
The Metabolic pathway of glycolysis Converts glucos pyruvate by via a Series of intermediate Metabolites. Chemical Modification is performed by a different enzyme. Glycolysis (from glycose, an older term for glucose + -lysis degradation) is the Metabolic pathway that Converts glucose $C_6H_{12}O_6$, into pyruvate, CH_3COCOO^- (pyruvic acid), and a hydrogen ion, H^+. The free energy released in this process is used to form the high-energy Molecules ATP (adenosine triphosphate) and NADH (reduced nicotinamide adenine dinucleotide.

The glycolysis pathway Can be Separated into two phases:

1. The preparatory (or Investment) phase- Wherein ATP is Consumed.
2. The pay off phase- wherein ATP is produced.

The overall reaction of glycolysis is:-

D-Glucose



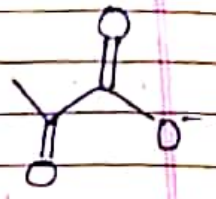
$+2\,[NAD]^+$

$+2\,[ADP]^-$

$+2\,[P]_i^-$

$\longrightarrow$

2x pyruvate



$+2\,[NADH]$

$+2\,H^+$

$+2\,[ATP]$

$+2\,H_2O$

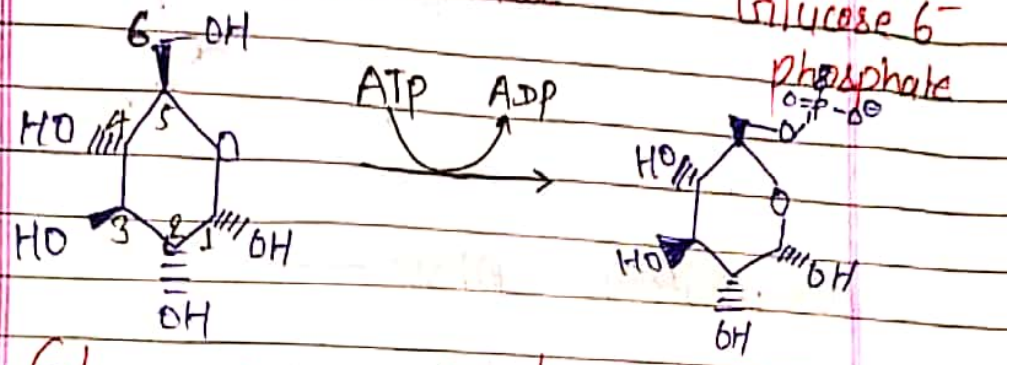
The use of Symbols in this equation makes it appear unbalanced with respect to oxygen atoms, hydrogen atoms, and Charges. Atom balance is maintained by the two phosphate (P_i) groups.

* Each exists in the form of a hydrogen phosphate anion (HPO_4^{2-}), dissociating to contribute $2H^+$ overall

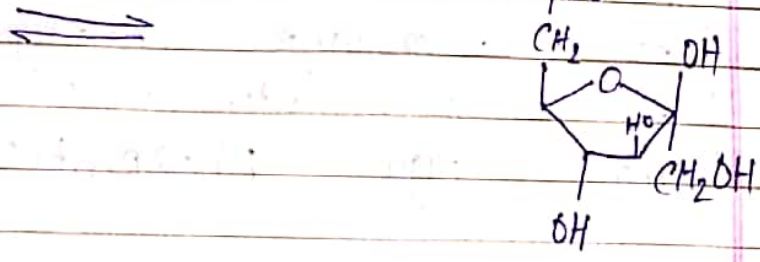
* Each liberates an oxygen atom when it binds to an adenosine diphosphate (ADP) Molecule. Contributing 2 O overall.

Summary of reactions —

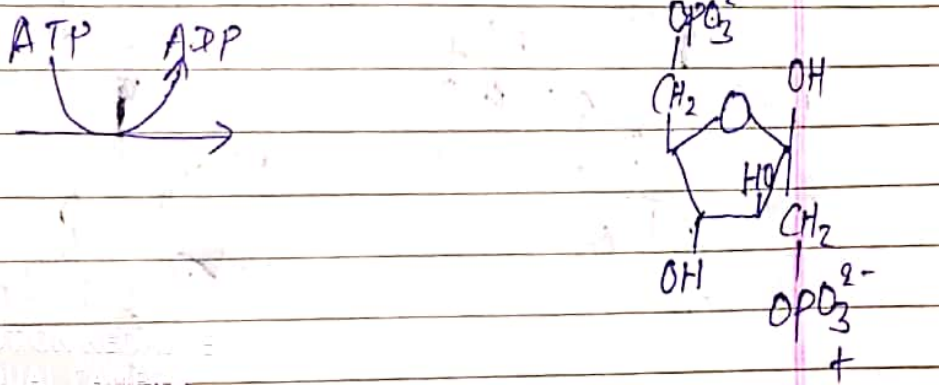
Glucose | Hexokinase | Glucose 6-phosphate



Glucose-6-phosphate isomerase | Fructose 6-phosphate

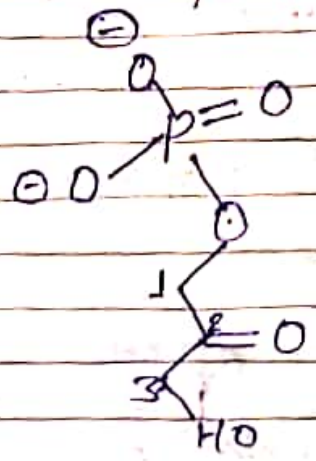


Phosphofructokinase-1 | Fructose 1,6-bisphosphate



Fructose-bisphosphate aldolase

Dihydroxyacetone phosphate



Preparatory phase —

The first five steps of Glycolysis are regarded as the preparatory (or investment) phase. Since they consume energy to convert the glucose into two three-Carbon Sugar phosphates.

D-Glucose (Glc)	Hexokinase glucokinase (HK) transferase	α-D-Glucose-6-phosphate (G6P)