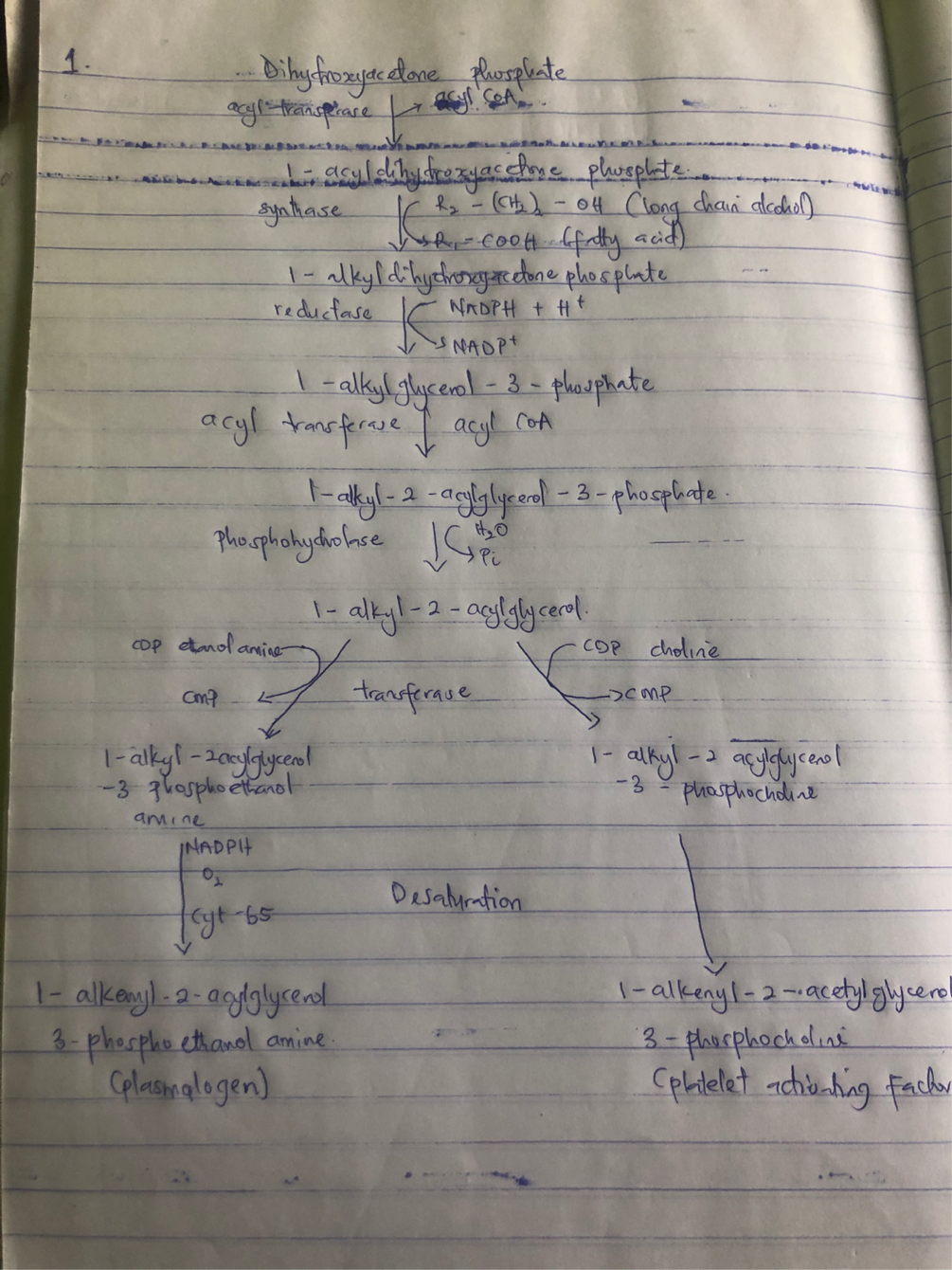
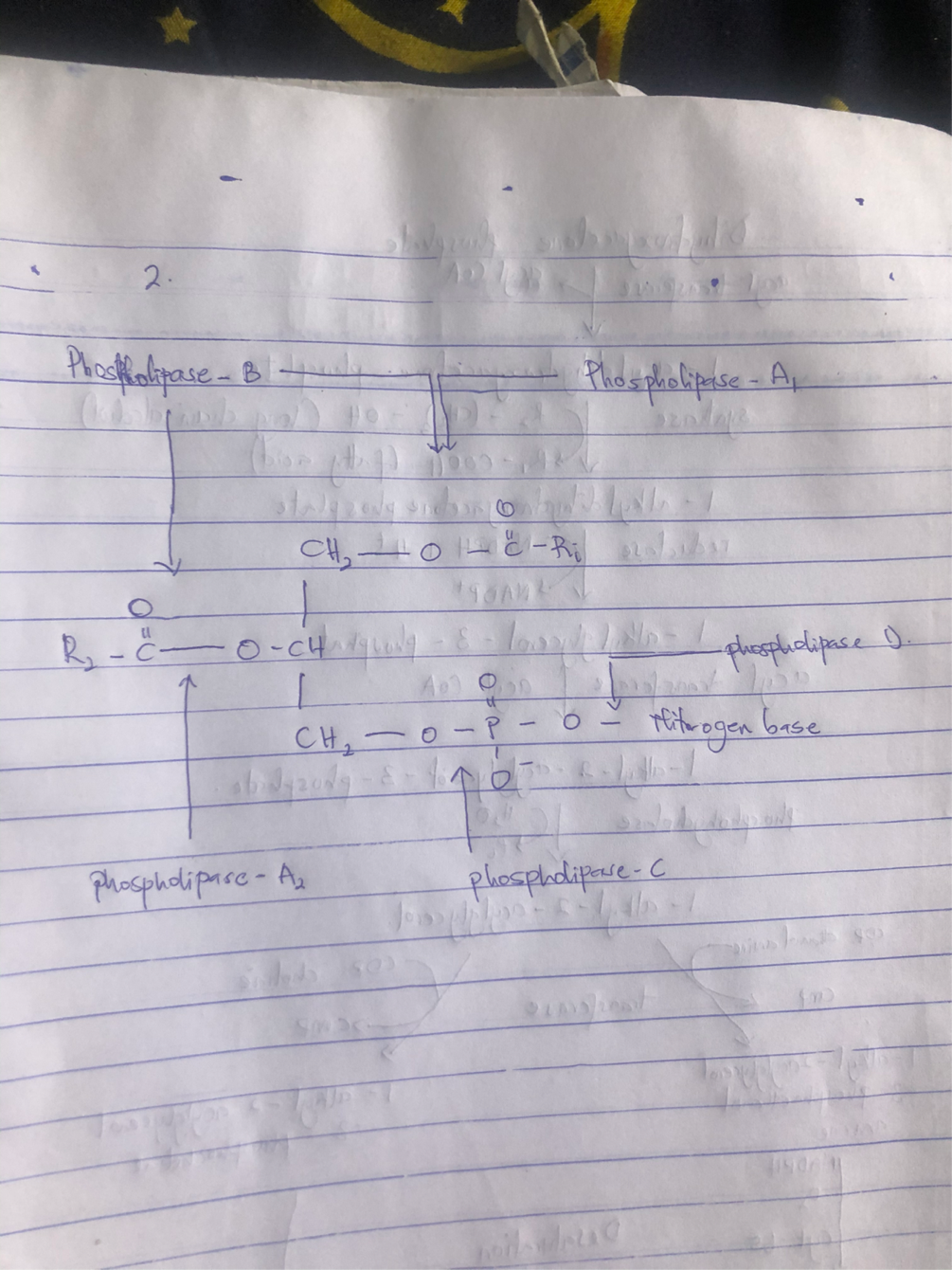
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17/SCI03/012

BCH 302 ASSIGNMENT

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i. Phospholipase-A1: Remove the fatty acyl group on C1 of the glycerol moiety.

ii. Phospholipase-A2: Catalyzes the hydrolysis of the ester bond of glycerophospholipids to form a free fatty acid and lysophospholipid, which is attacked by lysophospholipase by removing the remaining 1-acyl group.

iii. Phospholipase-B: Hydrolyzes both acyl groups on C1 and C2.

iv. Phospholipase-C:  Cleaves the bond, between phosphate and glycerol of phospholipids.

v. Phospholipase-D: Cleaves the bond between the phosphate and the Nitrogen base.

3a. Biosynthesis of Glycolipids

Cerebroside is the simples glycosphingolipids. In a cerebroside, glucose or galactose is linked to the terminal hydroxyl group of ceramide to form glucocerebroside or galactocerebroside.

Galactocerebroside is is a major lipid of myelin, wherease glucocerebroside is the major glycolipid of extraneural tissues and a precursor of most of the more complex glycolipids.

• Ceramide reacts with UDP-glucose or UDP-galactose to form glucocerebroside or galactocerebroside respectively.

• Ganglosides are the major complex glycolipids, contain a branched chain oligosaccharides of as many as seven sugar residues

• Ganglosidses are produced from ceramide by the stepwise addition  of activated sugar, eg. UDP-glucose, UDP-galactose and sialic acid usually N-acetylneuraminic acid (NANA).

3b. Degradation of Glycolipids

• The glucocerebrosides and galactocerebrosides are hydrolyzed by lysosomal enzymes beta-glucoserebrosidase and beta-galactocerebrosidase respectively to ceramide and hexose residues. The ceramide so formed is further cleaved by another lysosomal enzyme ceramidase to sphingosine and free fatty acid.

• The different gangliosides are degraded by a set of lysosomal enzymes, beta-glucosidase, beta-hexasominidase, beta-galactosidase, neuramidase.