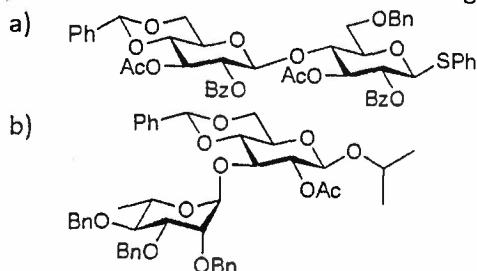
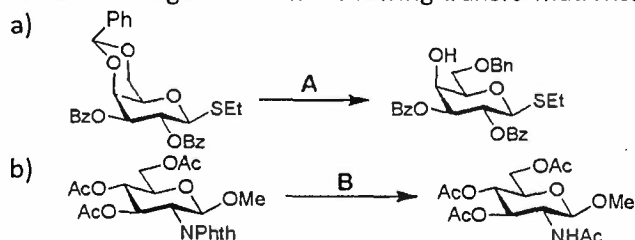


1. Write the structure of the following molecules: 2 × 1.5
- Ethyl 2,3-di-*O*-benzoyl-4-*O*-acetyl-6-*O*-trityl-β-D-galactopyranoside
  - Methyl 2,3-*O*-isopropylidene-4,6-di-*O*-acetyl-α-D-mannopyranoside

2. Write the IUPAC names of the following structures: 2 × 2



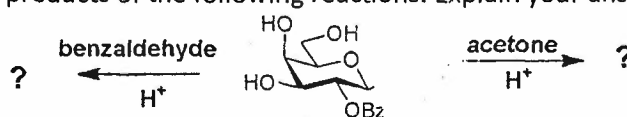
3. Write the reagents for the following transformations: 2 × 1.5



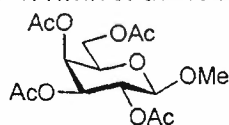
4. a) Write the detailed scheme for the synthesis of the following protected disaccharide from commercially available D-glucose (you must show every steps with appropriate reagents). 7

Methyl 2,3-di-*O*-benzoyl-4,6-*O*-benzylidene-β-D-glucopyranosyl-(1→4)-2,3-di-*O*-acetyl-6-*O*-trityl-β-D-glucopyranoside

- b) Write the major products of the following reactions. Explain your answer. 2 × 1.5



5. Answer the questions regarding the <sup>1</sup>H NMR of the following compound:



- a) Complete the following table 4

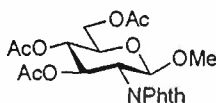
Proton	Peak multiplicity	Coupling constant
H-1		
H-2		
H-4		
H-6a		

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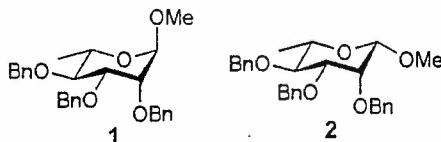
DDm

- b) What changes in the  $^1\text{H}$  NMR spectrum will you expect in respect of the signals for H-1 and H-2 if the corresponding  $\alpha$ -anomer of the compound is concerned? Explain in respect of peak multiplicity and coupling constant. 2

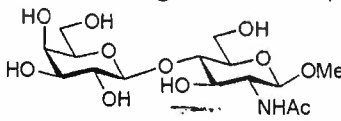
- c) How many 'carbon' peaks would you expect for the 'acetates' in the following compound? 2



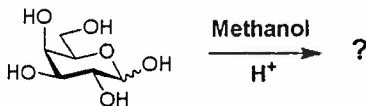
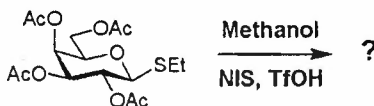
- d) What will be the peak multiplicity of the anomeric protons of the following compounds? 2



6. a) Write the detailed scheme for the synthesis of the following disaccharide from commercially available D-galactose and D-glucosamine hydrochloride 6



- b) What will be the major anomer for the following reactions? Explain your answer with mechanism. 4



*Balaram Mukhopadhyay*  
01/05/19

*DB*