

You have to use the designated spaces for your answers. No extra pages will be provided.

Problem 1: The CYK Algorithm (10 points)

Consider the following context-free grammar.

$$S \rightarrow AB \mid BB \mid \mathbf{b}$$

$$A \rightarrow BA \mid \mathbf{a}$$

$$B \rightarrow CB \mid \mathbf{b}$$

$$C \rightarrow AB \mid BB \mid \mathbf{a}$$

Now run the CYK algorithm to decide whether the string **baaba** can be derived in the grammar above. You must fill in the entire CYK table below.

1, 5				
1, 4	2, 5			
1, 3	2, 4	3, 5		
1, 2	2, 3	3, 4	4, 5	
1, 1	2, 2	3, 3	4, 4	5, 5