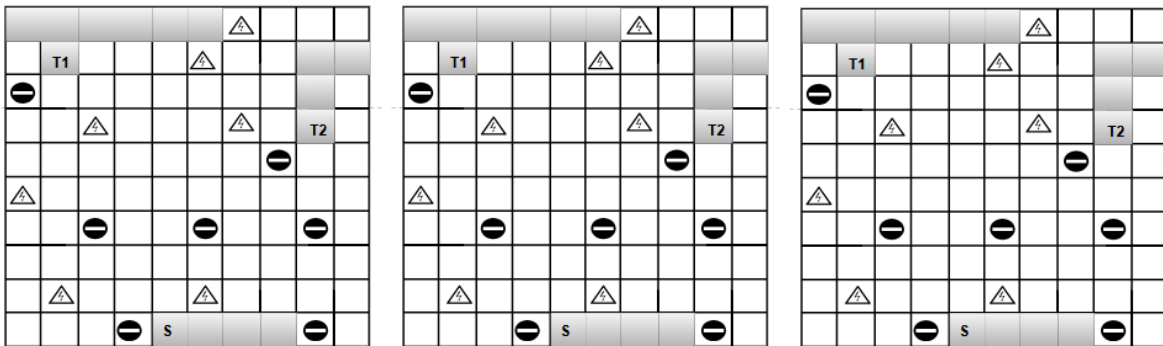Lee's

Q1.

For question (a) you are given a certain **chip planning** task. You have **four blocks** with the following areas. The dimension of each small grid is 0.5×0.5

Block A: $A = 2$

Block B: $A = 9$

Block C: $A = 4$

Block D: $A = 3$

- are metals and $\ominus$, $\triangle$ are obstacles

(a)	**Find** and draw a floor plan with the minimum total area enclosed if the **global bounding box** is a 20×20 grid.	[3]
(b)	**Find** the **Manhattan** Distance from S to T1.	[2]
(c)	Using **Lee's Maze Algorithm**, find the shortest path from S to T1 and T2, allowing minimum bends	[4]
(d)	**Find** the memory requirement for the algorithm if we use a sequence of **natural numbers**. If the **maximum memory** requirement of the provided grid is **45 bytes**, find how many **unique numbers** starting from 0 can be used for wave propagation in **Lee's maze** algorithm.	[6]