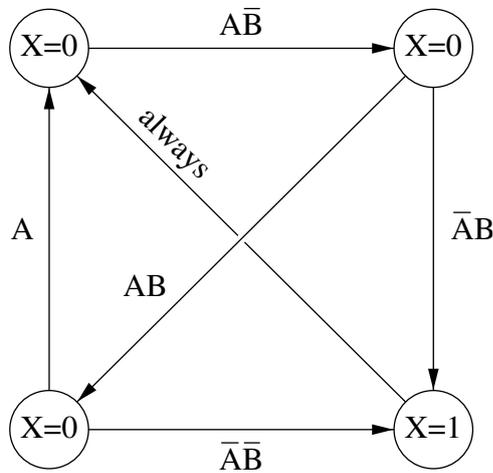# 1996 Paper 10 Question 13

Digital Electronics

An electronically controlled mousetrap has detectors to indicate when the trap door is entirely open (D), entirely closed (C), when there is something in the trap (S) and when the thing in the trap is heavier than a mouse (H). A single control (T) is used for opening ($T{=}1$) or closing ($T{=}0$) the trap door. Unfortunately the H signal is valid only when the door is shut.
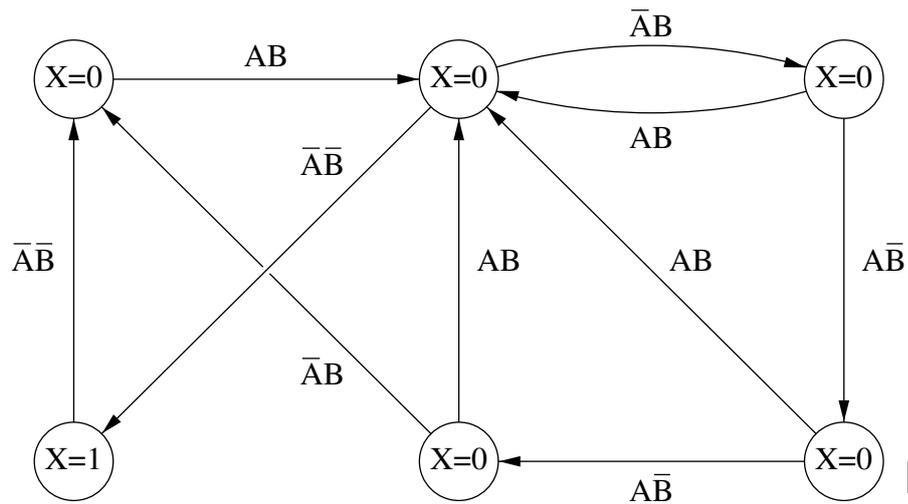
Draw a state diagram for the system taking care not to trap the cat.   [8 marks]

Provide equations for the output and controls of JK flip flops to implement a machine with the state diagram below (A and B are inputs, X is the output).

[8 marks]

Simplify the following state diagram:

[4 marks]