Lab 12. Traffic light fault detection system

Traffic lights consist of Red, Yellow and Green lights.

1. When only one of three lights is ON (use 1 as ON, 0 as OFF), the traffic lights’ circuits work well (Use 0 as work well, 1 as circuit problem).
2. When Green light and Yellow light are ON simultaneously, the traffic lights’ circuits work well.
3. When all the other conditions occur, the traffic lights’ circuits work abnormally

Please design a fault detection system: corresponding to each condition, it can indicate whether the traffic lights’ circuits are working well or abnormally.

1. Please use Karnaugh map to simplify the fault detection system and you’ll have the simplest Sum-of-product form. And show it to me.
2. Use Simulink to achieve it. In Simulink, please consider using constant as input and show the output on a scope. Please show me that your design’s output when red and green are both on and when green and yellow are both on.

Please take the picture of the K-map. For each abnormal condition, take the screenshot of the structure (inputs are configured properly) and the output for error indication (scope wave). Collect picture and all the screenshots in a Word file and submit it in canvas.