

**Reliability of Technical Systems**  
**Tutorial #6**  
**Due: November 2nd, 2010**

Q1) A driver is traveling alone with a SUV in the desert. What is the probability that the vehicle stops with a flat tire, if a spare tire is carried by this driver? In this question, you can assume that no extra spare tires are available. Here are the data you could use for solving this question.

- Failure rate of one tire :  $\lambda = 10^{-4}$  [1/hour]
- Failure rate of the spare tire:  $\lambda_s = 10^{-3}$  [1/hour]
- Repair duration (time to install the spare tire):  $t_{r1} = 2$  hours

Q2) It takes about a week for the driver to go to shop and bring new spare tire (you may assume repair rate is about  $6 \cdot 10^{-3}$  (1/hour) ). In this case, what is the probability that the vehicle stops with a flat tire, assuming other parameters remain the same as the Q1.

*\* Hint: You may assume the descriptions of these questions can be regarded as steady-state behaviors.*