

King Fahd University of Petroleum & Minerals  
Department of Mathematics & Statistics  
STAT-319-Term181  
Quiz #1-16/9/2018

Name:

ID:

Serial:

---

**Q1:** The foundation of a wall can fail either by excessive settlement or from bearing capacity. The respective failures are represented by events  $A$  and  $B$ , with probabilities  $a$ , and  $b$  respectively. The probability of failure in bearing capacity given that the foundation displays excessive settlement is  $\beta$ .

- Find the probability of failure of the wall foundation.
- Find the probability that there is excessive settlement in the foundation but there is no failure in bearing capacity.
- Find the probability that the foundation has excessive settlement given that it fails in bearing capacity.

**Q2:** For the events  $A$  and  $B$ ,  $P(B) = k$ ,  $P(A|B) = k^2$ ,  $P(A|\bar{B}) = 2k$ , find the value of  $k$  such that the events  $\bar{A}$  and  $\bar{B}$  are mutually exclusive and  $k < 1$ .