King Fahd University of Petroleum & Minerals
Department of Mathematics & Statistics
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Quiz #1

Name: *ID:* *Serial:*

Q1: (*2 pts. each*) Provide a reasonable description of the sample space for each of the following.

a. The following two questions appear on an employee survey questionnaire. Each question is chosen from five – point scale 1 (never), 2, 3, 4, 5 (always).
    1. Is the corporation willing is listen to and fairly evaluate new ideas?
    2. How often are my coworkers important in my overall job performance?

b. The time until a service transmutation is requested of a computer to the nearest millisecond.

Q2: (*2 pts. each*) In a process that manufactures aluminum cans, the probability that a can has a flaw on its side is 0.02, the probability that a can has a flaw on the top is 0.03, and the probability that a can has a flaw on both the side and the top is 0.01. A can randomly selected,

1. What is the probability that it has a flaw?

2. What is the probability it has no flaw?

3. What is the probability it has flaw on the top but not on its side?

4. What is the probability that a can will have a flaw on the side, given that it has a flaw on the top?

Q3: An old car with a four – cylinder engine is brought in for a tune – up. Let X represent the number of cylinders with low compression.

1. (*2 pts.*) Which of the three functions given in the following table is a possible probability mas function of X? Explain.

	$\boldsymbol{X}$				
	0	1	2	3	4
$\boldsymbol{P(X = x)}$	0.2	0.2	0.3	0.1	0.1
$\boldsymbol{P(X = x)}$	0.1	0.3	0.3	0.2	0.2
$\boldsymbol{P(X = x)}$	0.1	0.2	0.4	0.2	0.1

2. (*3 pts.*) For the possible probability mass function, compute the expected value and the standard deviation.

Q4: (*3 pts.*) For the events A and B, $P(B) = k$, $P(A|B) = k^2$, $P(A|\bar{B}) = 2k$, find the value of k if the events $\bar{A}$ and $\bar{B}$ are mutually exclusive and $k < 1$.