

ENEE324 Fall 2016. Problem set 5

Date due October 19, 2016

Please justify your answers

1. A fair coin is tossed 4 times. Let X be the RV equal to the number of Heads. Find the conditional PMF $p_X(k|X \text{ even})$ for $k = 0, 1, 2, 3, 4$.

2. Let X be a Poisson RV with the parameter λ . What is the probability that X is even?

3. Consider an RV X with the pmf

$$f_X(x) = \begin{cases} \frac{c}{x^2}, & 1 < x < 3 \\ 0 & \text{o/w.} \end{cases}$$

Find c , find

$$P(|X - EX| < 2\sigma_X),$$

where σ_X is the standard deviation of X .

4. Let X be an RV with pdf $f_X(x) = c/\sqrt{1-x^2}$, $-1 < x < 1$ and 0 o/w. Find c , find $P(X \leq x)$ for all real values of x .

5. Consider an RV X with pdf $f_X(x) = 1/4$ if $-2 < x < 2$ and 0 o/w. Find the pdf of the RVs $Y = X^2$ and $Z = X^3$.