

## 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  $\lambda$ . 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  $\sigma_X$  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  $Z = X^3$ .