

Sample



HAIGAZIAN UNIVERSITY
Mathematics Department

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Mat 233 (probability & Statistics) Quiz 2

Dec 21/2008

Time : 75 mins

Name: Ziuno (hs)

Part 1

Do this part on the answer booklet .

(25%) 1. The lifetime of a certain brand of batteries in years is a random variable x with the (p.d.f)

$$f(x) = \begin{cases} 1/3, & 0 < x < 1 \\ (4/3)(x-1), & 1 < x < 2 \\ 0, & \text{otherwise} \end{cases}$$

- Sketch the graph of the given density.
- Calculate the probability that a given battery lasts less than 6 months.
- Calculate the probability that a battery lasts over a year and a half.
- Calculate the median lifetime.
- Find the (c.d.f) formula.

(25%) 2. X and Y have the joint distribution.

X	0	1	2	3	4	5
Y 1	0.00	0.07	0.05	0.01	0.03	0.05
2	0.06	0.04	0.04	0.09	0.04	0.09
3	0.05	0.08	0.08	0.08	0.06	0.08

- Find $p(X \leq 1, Y \geq 2)$.
- Find the marginal (P.m.f) s of X and Y .
- Calculate the means of X and Y .
- Calculate $E(X/Y=1)$ and $E(Y/X=3)$.
- Find the variance of $Z = 2X - Y$.

(25%) 3. X and Y have the joint p.d.f $f(x,y) = 1$, where (x,y) belongs to the shaded area:



- Find $p(Y \leq X/2)$.
- Find the marginal (p.d.f)s of X and Y .
- Are X and Y independent.
- Calculate the means of X and Y .
- Calculate the covariance of X and Y .

(25%)4. a) Given $E((x-2)^2) = 10$, and $E((X+2)^2) = 16$, find the mean and variance of X .

b) A box contains 10 balls numbered 1 through 10. A ball is to be selected at random with replacement 5 times. Let X be the smallest of the 5 selected numbers, find the formula for the (p.m.f) of X . (don't supply a table, just a formula in terms of x where x is a possible value of the random variable X).

GOOD LUCK\$\$\$\$\$