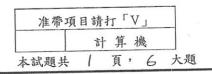
淡江大學 99 學年度碩士班招生考試試題

系別:數學學系

科目:機 率 論



- 1. (10%) Let P(A) = 0.3 and P(B) = 0.6.
 - (a) Find $P(A \cup B)$ when A and B are independent.
 - (b) Find P(A'|B') when A and B are disjoint. (A'表示 A之補集)
- 2. (20%) Let *X* have the pdf $f(x) = x^2/3$, $-1 \le x \le 2$.
 - (a) Find the mean and median of X.
 - (b) Set $Y = X^2$. Find the pdf of Y.
- 3. (20%) Let X and Y be independent random variables with EX = 1, EY = 2, Var(X) = 3, and Var(Y) = 1. Find E(3X Y + 4), Var(X Y), Var(XY), and $\rho(X + Y, X Y)$. (Here ρ is the correlation coefficient).
- 4. (20%) Let X have a binomial distribution Bin(n, p). Find the moment-generating function of X to calculate its mean and variance.
- 5. (20%) Let f(x, y) = 8xy, $0 \le x \le y \le 1$, be the joint p.d.f. of X and Y.
 - (a) Compute P(0 < X < 1/2, 0 < Y < 1/2) and EXY.
 - (b) Find the marginal p.d.f. of X and the conditional p.d.f. of Y, given X=x.
- 6. (10%) Let X be a Poisson random variable with mean $\mu = 25$. Use normal approximation with continuity correction(連續性修正) to find $P(2 \le X < 7)$. (以 $N(0,1) \ge c.d.f$ $\Phi(x)$ 表示答案)