

一. (每小题10分, 共40分)

$$1. (1) p_1 = \frac{M_1}{N_1} = \frac{2(n-r-1)(n-2)!}{n!} = \frac{2(n-r-1)}{n(n-1)}, \quad (2) p_2 = \frac{M_2}{N_2} = \frac{2(n-2)!}{(n-1)!} = \frac{2}{n-1}$$

若按顺时针(或逆时针)则 $p_2 = \frac{1}{n-1}$.

$$2. (3) E(Y|X=x) = \frac{1+x}{2}, \quad 0 < x < 1; \quad (4) D(Y|X=x) = \frac{1}{12}(x-1)^2, \quad 0 < x < 1.$$

$$3. (5) \beta_D(\frac{1}{2}) = \frac{22}{1024}, \quad (6) \text{犯第一类错误的概率为 } 1 - \beta_D(\frac{1}{2}) = \frac{1002}{1024}$$

$$4. (7) \hat{\theta}_{B1} = 2^{\frac{1}{\alpha+n}} \theta_1, \quad \theta_1 = \max\{Z_{(n)}, \theta_0\}, \quad Z_{(n)} = \max\{Z_1, \dots, Z_n\}$$

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$$(8) \hat{\theta}_{B2} = \frac{1}{\alpha+n-1} \theta_1, \quad \theta_1 \text{ 的意义同 (7).}$$