

大葉大學九十三年學年度碩士班甄試試題紙

所 別	組別	考 試 科 目 (中文名稱)	考試日期	考試時間	備註
事業經營研究所	甲	統計學	12月8日	9:00~10:30	可使用不可 程式計算機

註：備註欄若未註明可攜帶計算機或其他輔助工具作答時，考生一律不准攜帶。

(共五題，每題二十分)

- The service times for customers coming through a checkout counter in a retail store are independent random variables with a mean of 1.5 minutes and a variance of 1.0. Approximate the probability that 100 customers can be serviced in less than 2 hours of total service time.
- Let Y_1 and Y_2 be random variables with density function

$$f(y_1, y_2) = 2y_1, 0 \leq y_1 \leq 1; 0 \leq y_2 \leq 1$$

$$= 0 \quad \text{elsewhere}$$

Find variance $V(Y_1)$.

- Arrivals of customers at a certain checkout counter follow a Poisson distribution. It is known that during a given 30-minute period one customer arrived at the counter. Find the probability that the customer arrived during the last 5 minutes of the 30-minute period.
- An experimenter wishes to compare the effectiveness of two methods of training industrial employees to perform a certain assembly operation. The selected employees are to be divided into two groups of equal size, the first received training method 1 and the second, training method 2. Each employee will perform the assembly operation, and the length of assembly time will be recorded. It is expected that the measurements for both groups will have a range of approximately 8 minutes. If the estimate of the difference in mean time to assemble is desired correct to within 1 minute with probability equal to .95, how many workers must be included in each training group? (one fourth of the range will provide an approximate value for a standard deviation)
- The coded values for the measure of elasticity in plastic, prepared by two different processes, for samples of six drawn randomly from each of the two processes, are given in Table A. Do the data present sufficient evidence to indicate a difference in mean elasticity for the two processes? (use F test)

Table A Data for the measure of elasticity in plastic

Process A	Process B
6.1	9.1
7.1	8.2
7.8	8.6
6.9	6.9
7.6	7.5
8.2	7.9

* F statistic for $\alpha = .05$ is 4.96

* $p(0 \leq z) = 0.3413$ when $z = 1.0$

= 0.4332 when $z = 1.5$

= 0.4772 when $z = 2.0$

= 0.4938 when $z = 2.5$

= 0.4987 when $z = 3.0$