Multiple Choice. Choose the one alternative that best completes the statement or answers the question (25%)

1. _____Suppose a large labor union wishes to estimate the mean number of hours per month a union member is absent from work. The union decides to sample 339 of its members at random and monitor the working time of each of them for 1 month. At the end of the month, the total number of hours absent from work is recorded for each employee. Which of the following should be used to estimate the parameter of interest for this problem? (A) A large sample confidence interval for μ (B) A large confidence interval for p (C) A small confidence interval for p (D) A small confidence interval for μ
2. I want to test Ho: p=0.5 vs. Ha: p≠0.5 using a test of hypothesis. If I concluded that p is 0.5 when, in fact, the true value of p is not 0.5 then I have made a _____ (A) correct decision (B) Type I and Type II error (C) Type I error (D) Type II error
3. _____Parking at a university has become a problem. University administrators are interested in determining the average time it takes a student to find a parking sport. An administrator inconspicuously followed 220 students and recorded the how long it took each of them to find a parking sport. Identify the variable of interest to the university administration. (A) number of students who cannot find a spot (B) number of empty parking sports (C) students who drive cars on campus (D) time to find a parking sport
4. The _____ generally describes fluctuations of the time series that are attributable to business and economic conditions. (A) season variation (B) cyclical fluctuation (C) residual effect (D) secular trend
5. The Central Limit Theorem is considered powerful in statistics because _____ (A) it works for any sample size provided the population is normal (B) it works for any population distribution provided the sample size is sufficiently large (C) it works for any sample provided the population distribution is known. (D) it works for any population distribution provided the population mean is known

淡江大學 97 學年度碩士班招生考試試題

127-2

系別：資訊管理學系　　科目：統　計　學

准帶項目請打「V」	
V	簡單型計算機

本試題共 3 頁，2 大題

Solve the Problem

1. A certain baseball player hits a home run in 7% of his at-bats. Consider his at-bats as independent events. Find the probability that this baseball player hits more than 42 home runs in 800 at-bats? (10%)
2. The director of a hospital wishes to estimate the mean number of people who are admitted to the emergency room during a 24-hour period. The director randomly selects 64 different 24-hour periods and determines the number of admissions for each. For this sample, $\bar{x}=19.8$ and $s^2=36$. If the director wishes to estimate the mean number of admissions per 24-hour period to within 1 admission with 95% reliability, what is the minimum sample size she should use? (10%)
3. The number of traffic accidents that occur on a particular stretch of road during a month follows a Poisson distribution with a mean of 7.1. Find probability that fewer than three accidents will occur next month on this stretch of road. (10%)
4. A machine is set to pump sprayer into a process at the rate of 6 gallons per minute. Upon inspection, it is learned that the machine actually pumps cleanser at a rate described by the uniform distribution over the interval 6 to 8 gallons per minute. Would you expect the machine to pump more than 7.9 gallons per minute? (10%)
5. It is desired to test $H_0: \mu=12$ against $H_a: \mu\neq 12$ using $\alpha=0.05$. The population in question is uniformly distributed with a standard deviation of 2. A random sample of 100 will be drawn from this population. If μ is really equal to 11.9 what is the value of β associated with this test? (10%)
6. Suppose that B_1 and B_2 are mutually exclusive and complementary events, such that $P(B_1)=0.6$ and $P(B_2)=0.4$. Consider another event A such that $P(A|B_1)=0.2$ and $P(A|B_2)=0.5$. Find $P(B_1|A)=?$ (10%)
7. The professor would like to use the data to find the first-order model that he might use to predicate a student's grade on the first test using those students' grades on the first three quizzes.

7.1. Identify the dependent and independent variables for the model. (5%)

7.2. What is the least squares predication equation? (5%)

7.3. Find the SSE and the estimator σ^2 for the model. (5%)

Student	Test Grade	Quiz 1	Quiz 2	Quiz 3
1	75	8	9	5
2	89	10	7	6
3	73	9	8	7
4	91	8	7	10
5	64	9	6	6
6	78	8	7	6
7	83	10	8	7
8	71	9	4	6

淡江大學97學年度碩士班招生考試試題

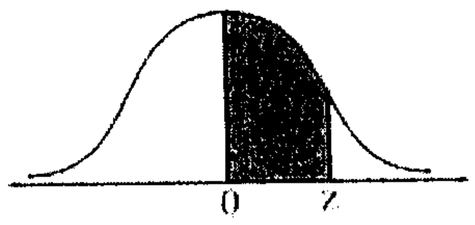
127-3

系別：資訊管理學系　　科目：統　計　學

准帶項目請打「V」	
V	簡單型計算機

本試題共 3 頁，2 大題

Appendix



Areas Under the Normal Curve

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998
3.5	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998