

國立勤益科技大學九十八學年度研究所碩士班招生筆試試題卷
所別：流通管理系 組別：

科目：統計學

准考證號碼：□□□□□□□□ (考生自填)

考生注意事項：

一、考試時間 100 分鐘。

二、應考人不得自行攜帶電子計算器，一律由本校統一提供

三、

試題一：〈 10 分〉

請解釋何謂 type I error 與 type II error?

試題二：〈 10 分〉

A chain store is going to buy a lot of 20 white dishes recently shipped from a manufacturer in China. Experience has shown that a good way to judge a lot of size 20 for defective dishes is to select 4 of the 20 at random, without replacement, and then buy the lot only if all 4 are in perfect condition. What is the probability of buying the lot if 4 of the dishes in the lot are defective?

試題三：〈 30 分〉

假設已知母體變異數 (σ^2) 是 25，但未知母體平均數 (μ) 的常態分配中取出 n 個樣本 $X_1, X_2, X_3, \dots, X_n$ ，在顯著水準 0.05 下欲檢定以下假設：

$H_0: \mu \geq 30, H_1: \mu < 30$ 。

- (1) 請寫出決策規則 (即寫出拒絕域 reject region 的形式) (10%)
- (2) 若樣本數 $n = 16$ ，求 $\mu = 26.7$ 時的檢定力(power)。 (10%)
- (3) 若希望 $\mu = 26.7$ 時的檢定力達到 0.95，請問至少需取多少樣本數? (10%)

試題四：〈 30 分〉

某五星級大飯店的住屋率(%)(X)與每天每間客房的成本(元)(Y)如下：

X	100	75	65	55	50
Y	1900	2400	2700	3150	3500

- (1) 試求迴歸直線 $\hat{Y} = \hat{\alpha} + \hat{\beta}X$ 。(6%)
- (2) 試檢定此迴歸直線的斜率是否為零？($\alpha=0.05$) (6%)
- (3) 若將 Y 的單位換成千元，試求此新的迴歸直線，並檢定其斜率是否為零？($\alpha=0.05$) (6%)
- (4) 若 Y 的單位仍為元，但將 X 以小數點表示(如75%表為0.75)，求此新的迴歸直線，並檢定其斜率是否為零？($\alpha=0.05$) (6%)
- (5) 比較以上四小題的答案，若將自變數或依變數的單位改變，是否會影響斜率的檢定結果？(6%)

$$t_{3,0.025} = 3.182 \quad t_{4,0.025} = 2.776 \quad t_{5,0.025} = 2.571$$

$$t_{3,0.05} = 2.353 \quad t_{4,0.05} = 2.132 \quad t_{5,0.05} = 2.015$$

試題五：〈20 分〉

調查某時裝業、電信業、印刷業員工年薪（以萬元計），如下表所示。在顯

著水準 $\alpha=0.05$ 下：

(1) 試檢定三種行業員工平均年薪是否相同？($\alpha=0.05$) (10%)

(2) 請驗證 $SST=SSB+SSW$ ？(SST =Total Variance, SSB =Between Variance, SSW =Within Variance) (10%)

假設樣本資料來自於常態母體，且具有相同的變異數。

樣本	時裝業	電信業	印刷業
1	55	60	58
2	53	62	59
3	58	59	62
4	60	56	60
5	50	53	54

$$F_{5,12}(0.05) = 4.68 \quad F_{2,12}(0.05) = 19.41 \quad F_{12,12}(0.05) = 2.69 \quad F_{2,15}(0.05) = 19.43$$

附表

常態分配表

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