國立高雄第一科技大學 100 學年度 碩士班 招生考試 試題紙

系 所 別：金融理財研究所　　組　別：不分組

考科代碼：1441　　考　科：統計學

注意事項：

1、**本科目得使用本校提供之電子計算器。**

2、請於答案卷上規定之範圍作答，違者該題不予計分。

1. (15 points) Let A, B and C be independent and variables, and their mean (E(.)) and variance (Var(.)) are as follows.

   E(A)=1　　Var(A)=3

   E(B)=4　　Var(B)=7

   E(C)=3　　Var(C)=2

   What is the mean and variance of

   (1) X=3A+4B　(2) Y=B-3C　(3) Z=X+Y

2. (10 points) If Var(A)=16, Var(B)=9 and Cov(A,B)= -6, please find

   (1) The correlation coefficient between A and B

   (2) The correlation coefficient between (3A+2) and (2B-1)

3. (12 points) Suppose that a random sample of eight observations is taken from a Normal Distribution for which both the mean μ and the variance σ^2 are unknown. And suppose that the observed values are 3.1, 3.5, 2.6, 3.4, 3.8, 3.0, 2.9, 2.2.

   Please find the shortest confidence interval for μ andσ^2 with confidence level of 95%.

4. (5 points) A random sample of n=50 observations from a population produced a mean $\bar{X} = 875$ and s=21.

   Test the hypothesis that μ=880 against the alternative that μ is either greater or less than 880 with confidence level of 95%.

Z 分配、t 分配與 χ^2 分配右尾百分點	
$\alpha = .025$	Z=1.96; t(8)=2.306; t(7)=2.365; $\chi^2(8)$=17.8346; $\chi^2(7)$=16.0128
$\alpha = .05$	Z=1.645; t(8)=1.86; t(7)=1.895; $\chi^2(8)$=15.5073; $\chi^2(7)$=14.0671
$\alpha = .1$	Z=1.2815; t(8)=1.397; t(7)= 1.415
$\alpha = .975$	$\chi^2(8)$=2.17973; $\chi^2(7)$=1.68987
$\alpha = .950$	$\chi^2(8)$=2.73264; $\chi^2(7)$=2.16735

5. (8 points) 假設小明想分析影響成績表現的因素，並蒐集了 100 位學生的資料，如下表所示：

學號	性別	每週讀書小時數	學期成績
001	男	10	80
002	女	9	75
⋮	⋮	⋮	⋮
099	男	5	72
100	女	8	82

請建立一條迴歸方程式，以研究「性別」和「每週讀書小時數」對成績的影響。（請清楚解釋變數的定義）

6. 指數股票型基金(Exchange Traded Funds，ETF)中，寶來台灣卓越 50(以下簡稱台灣 50)於 2003/06/30 上市，是臺灣證券市場第一支交易型指數，成分股涵蓋臺灣證券市場中市值前 50 大上市公司，於 2011/03/03 成分股票中權重最高的前五檔如下：

名稱	台積電(2330)	鴻海(2317)	宏達電(2498)	南亞(1303)	台塑(1301)
占台灣 50 指數權重	15.01%	8.92%	7.36%	5.44%	4.80%

請利用下表 2010 年的月報酬資料回答下列各小題(至小數點後四位，$\alpha = .05$)

Panel A: 2010 年的月報酬資料

年月	台灣 50	加權指數	台積電	鴻海	宏達電	南亞	台塑
201001	-6.3065	-6.9228	-4.7627	-11.9022	-15.1425	2.8743	-1.0456
201002	-2.7739	-2.7109	-4.4896	-5.7376	2.8170	5.6696	3.8296
201003	5.1051	6.3052	4.4895	7.9437	13.5458	2.0265	1.1495
201004	1.0088	1.0574	0.4866	7.6962	13.2351	2.1376	0.0001
201005	-8.9669	-8.2015	-2.6230	-17.6279	2.6793	-22.4276	-8.0281
201006	-1.1038	-0.6068	0.6622	-8.8106	-1.1562	-2.2947	5.1291
201007	8.4149	5.7174	7.8137	12.3612	40.7145	12.1280	3.9964
201008	-1.1196	-1.8775	-5.7725	-0.4264	-0.5117	9.1433	5.9482
201009	7.9320	7.8443	5.1292	3.9050	19.2245	10.1470	7.7221
201010	0.8558	0.5968	1.2822	-1.2847	-2.5716	-0.2927	13.5160
201011	1.9452	1.0251	0.9508	-6.6840	20.1196	-0.4411	3.2495
201012	7.2603	6.9214	11.3219	7.9687	6.3057	6.8306	7.2296
總和	12.2514	9.1481	14.4883	-12.5986	99.2595	25.5008	42.6964
平均	1.0210	0.7623	1.2074	-1.0499	8.2716	2.1251	3.5580
變異數	30.5337	27.6242	27.6796	86.3741	205.6411	80.3401	28.4014

Panel B: 部分 t 與 F 分配	
α = .025	F(10, 11) = 3.5257; F(10, 12) = 3.3736; F(11, 11) = 3.4737; F(12, 12) = 3.2773; F(13, 13) = 3.1150
α = .05	t(11) = 2.2010; t(12) = 2.1788; t(22) = 2.0739; t(23) = 2.0687; t(24) 2.0639; F(4, 4) = 6.3882; F(4, 55) = 2.5397; F(4, 60) = 2.5252; F(5, 55) = 2.3828; F(5, 60) = 2.3683; F(10, 11) = 2.8536; F(10, 12) = 2.7534; F(11, 11) = 2.8179; F(12, 12) = 2.6866; F(13, 13) = 2.5769
α = .1	t(11) = 1.7959; t(12) = 1.7823; t(22) = 1.7171; t(23) = 1.7139; t(24) = 1.7109
α = .975	F(10, 11) = .2729; F(10, 12) = .2762; F(11, 11) = .2879; F(12, 12) = .3051; F(13, 13) = .3210

(1) (20 points) 投資人若投資權重最高的這五檔股票，其獲得的報酬是否有顯著差異? (五檔股票報酬的 SST = 5,292.6933; SSE = 4,712.8003)

(2) (30 points) 由報酬與報酬波動性兩個角度分析，投資台灣 50 是否優於大盤?