



第一部份：觀念題(50%)

1. 雲科大辦理研究所甄試，採用兩種方案 A 與 B，A 案的結果可能錄取到較不理想的學生，B 案則可能發生優秀的學生被遺漏掉。若從假設檢定的觀念，欲檢定 A 案較佳或 B 案較佳，請問如何建立假設，並說明為什麼？(5%)
2. 已知 $X_i \sim N(0, 3)$ (3 表示常態分配的標準差)，則 $\sum_{i=1}^{10} X_i^2 / 9$ 為何種分配，其參數為何？(5%)
3. 設有一迴歸模型 $\hat{Y} = \alpha + \beta X$ ，已知 β 的 T 檢定統計量為 5，且 $n=10$ ， $\sum (Y - \hat{Y})^2 = 48$ 。請計算 R^2 。(9%)
4. 設有一檢定 $H_0: \mu_1 = \mu_2$ ，若樣本數增加，且其他條件不變下，則 P-value 有何改變？(5%)
5. 將 4 個球放入 5 個盒子中，設每個球落入各盒子的機率皆相同且獨立，且一個盒子可能會有一個以上的球之情形發生。試計算有球的盒子數 X 之期望值。(10%)
6. 設有兩個統計量 $\hat{\theta}_1$ 與 $\hat{\theta}_2$ ，用來估計母體參數 θ 。已知 $E(\hat{\theta}_1) = 2$ ， $E(\hat{\theta}_2) = 3$ ， $Var(\hat{\theta}_1) = 1$ ， $Var(\hat{\theta}_2) = 4$ ，且假定 θ 真實值 (True value) 為 3。請問此兩個統計量何者為 θ 較佳的估計量，為什麼？(5%)
7. 何謂檢定力 (test power)？為何不以 $1 - \alpha$ 作為檢定力？其中 α 表示顯著水準。(5%)
8. 假設一個盒子內裝有黑、白兩種球共 4 個，茲從盒中採放回抽樣抽出 3 個球，發現第 1 個與第 3 個球為黑球，第 2 個球為白球。請問你會估計盒中有多少個白球？為什麼？(6%)



第二部份：計算題（50%）

1. 緣於二技甄選報名人數過多，雲科大企管系欲將二技甄選學生分為兩組進行口試，以達效率化，然系主任想瞭解系上兩組不同口試委員在評審學生口試成績是否有顯著差異？請問您：
- (a) 系主任如何進行資料收集？（2%）
- (b) 系主任如何進行分析？（3%）
- (c) 又者將系上口試委員分為三組時，要如何進行資料收集與分析？（3%）
- (d) 若口試時間允許，為求能真正甄選出優秀同學，以上兩種方式（分為兩組與三組），您建議用哪一種？（2%）
2. 在競爭激烈的咖啡市場中，巴頓咖啡經市場調查及以下統計分析後，由所得情報，以決定其攻打之目標市場。巴頓咖啡行銷經理以人口統計變數—職業別進行市調，其將職業分為白領階層、中小企業負責人、學生族、藍領階層四個組。各組人數及對咖啡引用偏好分數之統計平均和變異數如下表：

統計量 \ 職業	白領階層	中小企業負責人	學生族	藍領階層
人數	12	10	10	12
平均數	8	7	3	2
變異數	9	9	4	4

- (a) 設在 $\alpha=0.05$ 下，請問職業不同對咖啡引用偏好是否有顯著差異？（8%）
- (b) 就（a）部分而言，若偏好相同時，其管理決策涵意為何？若偏好不同時，其管理決策涵意為何？（2%）
- (c) 若（a）部分檢定結果為顯著不相同時。但若將白領階層與中小企業負責人合併為重度偏好組，而將學生組與藍領階層合併為低度偏好組，對新合併的兩組檢定其平均偏好是否相等？（ $\alpha=0.05$ ）（6%）
- (d) 就（c）部分而言，若顯著不同時，試問管理決策涵意為何？（4%）



3. 以下為雲科大企研所 15 位同學之身高與體重資料：

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
身高	173	155	175	171	166	167	163	155	159	168	166	169	159	154	160
體重	66	49	72	68	63	64	61	52	55	65	61	73	57	49	60

- (a) 請描繪身高與體重散佈圖 (Scatter diagram)。您有何結論。(2%)
- (b) 請計算身高與體重之共變異數 (Covariance) 與相關係數 (Coefficient of correlation)。您有何結論。(3%)
- (c) 顯然 (b) 部分，由共變異數與相關係數之衡量結論相同，試問使用共變異數來衡量即可，為何還要使用相關係數來衡量。(3%)
- (d) 若共變異為 0 (或相關係數為 0)，其涵意為何？請繪出此狀況之體重與身高散佈圖型態。(2%)
- (e) 若單由 (b) 部分之相關係數，您認為本題合適執行迴歸分析嗎？請敘述迴歸與相關性之差異。(5%)

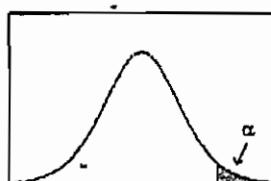
4. 雲科大企管所入學考試，學生可選考一種專業科目，選考管理學同學因管理學題目較難，致全體選考管理學同學平均分數偏低，其平均分數為 40 分，標準差為 5 分。另一組選考會計學之平均成績 80 分，標準差為 5 分。

- (a) 試問您如何處理，才能使選考管理學之優秀同學有上榜機會？(2%)
- (b) 使用 (a) 部分之處理過程，請問您：管理學考 55 分之考生，是否比會計學成績為 90 分之考生好呢？(3%)



t分配表

$$P(t_k \geq t_{k,\alpha}) = \alpha$$



$t_{k,\alpha}$

自由度	單尾顯著水準						
	0.1	0.05	0.025	0.01	0.005	0.0025	0.001
1	3.0777	6.3138	12.7062	31.8205	63.6567	127.3213	318.3088
2	1.8856	2.9200	4.3027	6.9646	9.9248	14.0890	22.3271
3	1.6377	2.3534	3.1824	4.5407	5.8409	7.4533	10.2145
4	1.5332	2.1318	2.7764	3.7469	4.6041	5.5976	7.1732
5	1.4759	2.0150	2.5706	3.3649	4.0321	4.7733	5.8934
6	1.4398	1.9432	2.4469	3.1427	3.7074	4.3168	5.2076
7	1.4149	1.8946	2.3646	2.9980	3.4995	4.0293	4.7853
8	1.3968	1.8595	2.3060	2.8965	3.3554	3.8325	4.5008
9	1.3830	1.8331	2.2622	2.8214	3.2498	3.6897	4.2968
10	1.3722	1.8125	2.2281	2.7638	3.1693	3.5814	4.1437
11	1.3634	1.7959	2.2010	2.7181	3.1058	3.4966	4.0247
12	1.3562	1.7823	2.1788	2.6810	3.0545	3.4284	3.9296
13	1.3502	1.7709	2.1604	2.6503	3.0123	3.3725	3.8520
14	1.3450	1.7613	2.1448	2.6245	2.9768	3.3257	3.7874
15	1.3406	1.7531	2.1314	2.6025	2.9467	3.2860	3.7328
16	1.3368	1.7459	2.1199	2.5835	2.9208	3.2520	3.6862
17	1.3334	1.7396	2.1098	2.5669	2.8982	3.2224	3.6458
18	1.3304	1.7341	2.1009	2.5524	2.8784	3.1966	3.6105
19	1.3277	1.7291	2.0930	2.5395	2.8609	3.1737	3.5794
20	1.3253	1.7247	2.0860	2.5280	2.8453	3.1534	3.5518
21	1.3232	1.7207	2.0796	2.5176	2.8314	3.1352	3.5272
22	1.3212	1.7171	2.0739	2.5083	2.8188	3.1188	3.5050
23	1.3195	1.7139	2.0687	2.4999	2.8073	3.1040	3.4850
24	1.3178	1.7109	2.0639	2.4922	2.7969	3.0905	3.4668
25	1.3163	1.7081	2.0595	2.4851	2.7874	3.0782	3.4502
26	1.3150	1.7056	2.0555	2.4786	2.7787	3.0669	3.4350
27	1.3137	1.7033	2.0518	2.4727	2.7707	3.0565	3.4210
28	1.3125	1.7011	2.0484	2.4671	2.7633	3.0469	3.4082
29	1.3114	1.6991	2.0452	2.4620	2.7564	3.0380	3.3962
30	1.3104	1.6973	2.0423	2.4573	2.7500	3.0298	3.3852
35	1.3062	1.6896	2.0301	2.4377	2.7238	2.9960	3.3400
40	1.3031	1.6839	2.0211	2.4233	2.7045	2.9712	3.3069
45	1.3006	1.6794	2.0141	2.4121	2.6896	2.9521	3.2815
50	1.2987	1.6759	2.0086	2.4033	2.6778	2.9370	3.2614
60	1.2958	1.6706	2.0003	2.3901	2.6603	2.9146	3.2317
70	1.2938	1.6669	1.9944	2.3808	2.6479	2.8987	3.2108
80	1.2922	1.6641	1.9901	2.3739	2.6387	2.8870	3.1953
90	1.2910	1.6620	1.9867	2.3685	2.6316	2.8779	3.1833
100	1.2901	1.6602	1.9840	2.3642	2.6259	2.8707	3.1737
200	1.2858	1.6525	1.9719	2.3451	2.6006	2.8385	3.1315
300	1.2844	1.6499	1.9679	2.3388	2.5923	2.8279	3.1176
400	1.2837	1.6487	1.9659	2.3357	2.5882	2.8227	3.1107
500	1.2832	1.6479	1.9647	2.3338	2.5857	2.8195	3.1066
600	1.2830	1.6474	1.9639	2.3326	2.5840	2.8175	3.1039
700	1.2828	1.6470	1.9634	2.3317	2.5829	2.8160	3.1019
800	1.2826	1.6468	1.9629	2.3310	2.5820	2.8148	3.1005
900	1.2825	1.6465	1.9626	2.3305	2.5813	2.8140	3.0993
1000	1.2824	1.6464	1.9623	2.3301	2.5808	2.8133	3.0984

國立雲林科技大學

八十八學年度研究所碩士班入學考試試題

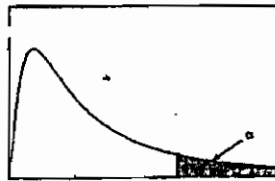
所別：企管所、資管所

科目：統計學

F分配表

$\alpha=0.05$

$$P(F_{m,n} \geq F_{m,n,\alpha}) = \alpha$$



$F_{m,n,\alpha}$

		分子自由度 m								
		1	2	3	4	5	6	7	8	9
分 母 自 由 度 n	1	161.448	199.500	215.707	224.583	230.162	233.986	236.768	238.883	240.543
	2	18.5128	19.0000	19.1643	19.2468	19.2964	19.3295	19.3532	19.3710	19.3848
	3	10.1280	9.5521	9.2766	9.1172	9.0135	8.9406	8.8867	8.8452	8.8123
	4	7.7086	6.9443	6.5914	6.3882	6.2561	6.1631	6.0942	6.0410	5.9988
	5	6.6079	5.7861	5.4095	5.1922	5.0503	4.9503	4.8759	4.8183	4.7725
	6	5.9874	5.1433	4.7571	4.5337	4.3874	4.2839	4.2067	4.1468	4.0990
	7	5.5914	4.7374	4.3468	4.1203	3.9715	3.8660	3.7870	3.7257	3.6767
	8	5.3177	4.4590	4.0662	3.8379	3.6875	3.5806	3.5005	3.4381	3.3881
	9	5.1174	4.2565	3.8625	3.6331	3.4817	3.3738	3.2927	3.2296	3.1789
	10	4.9646	4.1028	3.7083	3.4780	3.3258	3.2172	3.1355	3.0717	3.0204
	11	4.8443	3.9823	3.5874	3.3567	3.2039	3.0946	3.0123	2.9480	2.8962
	12	4.7472	3.8853	3.4903	3.2592	3.1059	2.9961	2.9134	2.8486	2.7964
	13	4.6672	3.8056	3.4105	3.1791	3.0254	2.9153	2.8321	2.7669	2.7144
	14	4.6001	3.7389	3.3439	3.1122	2.9582	2.8477	2.7642	2.6987	2.6458
	15	4.5431	3.6823	3.2874	3.0556	2.9013	2.7905	2.7066	2.6408	2.5876
	16	4.4940	3.6337	3.2389	3.0069	2.8524	2.7413	2.6572	2.5911	2.5377
	17	4.4513	3.5915	3.1968	2.9647	2.8100	2.6987	2.6143	2.5480	2.4943
	18	4.4139	3.5546	3.1599	2.9277	2.7729	2.6613	2.5767	2.5102	2.4563
19	4.3807	3.5219	3.1274	2.8951	2.7401	2.6283	2.5435	2.4768	2.4227	
20	4.3512	3.4928	3.0984	2.8661	2.7109	2.5990	2.5140	2.4471	2.3928	
21	4.3248	3.4668	3.0725	2.8401	2.6848	2.5727	2.4876	2.4205	2.3660	
22	4.3009	3.4434	3.0491	2.8167	2.6613	2.5491	2.4638	2.3965	2.3419	
23	4.2793	3.4221	3.0280	2.7955	2.6400	2.5277	2.4422	2.3748	2.3201	
24	4.2597	3.4028	3.0088	2.7763	2.6207	2.5082	2.4226	2.3551	2.3002	
25	4.2417	3.3852	2.9912	2.7587	2.6030	2.4904	2.4047	2.3371	2.2821	
26	4.2252	3.3690	2.9752	2.7426	2.5868	2.4741	2.3883	2.3205	2.2655	
27	4.2100	3.3541	2.9604	2.7278	2.5719	2.4591	2.3732	2.3053	2.2501	
28	4.1960	3.3404	2.9467	2.7141	2.5581	2.4453	2.3593	2.2913	2.2360	
29	4.1830	3.3277	2.9340	2.7014	2.5454	2.4324	2.3463	2.2783	2.2229	
30	4.1709	3.3158	2.9223	2.6896	2.5336	2.4205	2.3343	2.2662	2.2107	
35	4.1213	3.2674	2.8742	2.6415	2.4851	2.3719	2.2852	2.2167	2.1608	
40	4.0847	3.2317	2.8387	2.6060	2.4495	2.3359	2.2490	2.1802	2.1240	
45	4.0566	3.2043	2.8115	2.5787	2.4221	2.3083	2.2212	2.1521	2.0958	
50	4.0343	3.1826	2.7900	2.5572	2.4004	2.2864	2.1992	2.1299	2.0734	
60	4.0012	3.1504	2.7581	2.5252	2.3683	2.2541	2.1665	2.0970	2.0401	
70	3.9778	3.1277	2.7355	2.5027	2.3456	2.2312	2.1435	2.0737	2.0166	
80	3.9604	3.1108	2.7188	2.4859	2.3287	2.2142	2.1263	2.0564	1.9991	
90	3.9469	3.0977	2.7058	2.4729	2.3157	2.2011	2.1131	2.0430	1.9856	
100	3.9361	3.0873	2.6955	2.4626	2.3053	2.1906	2.1025	2.0323	1.9748	
120	3.9201	3.0718	2.6802	2.4472	2.2899	2.1750	2.0868	2.0164	1.9588	

國立雲林科技大學

所別：企管所、資管所

八十八學年度研究所碩士班入學考試試題

科目：統計學

		分子自由度 m								
		10	12	15	20	24	30	40	60	120
1		241.88	243.906	245.950	248.013	249.052	250.095	251.143	252.196	253.253
2		19.3959	19.4125	19.4291	19.4458	19.4541	19.4624	19.4707	19.4791	19.4874
3		8.7855	8.7446	8.7029	8.6602	8.6385	8.6166	8.5944	8.5720	8.5494
4		5.9644	5.9117	5.8578	5.8025	5.7744	5.7459	5.7170	5.6877	5.6581
5		4.7351	4.6777	4.6188	4.5581	4.5272	4.4957	4.4638	4.4314	4.3985
6		4.0600	3.9999	3.9381	3.8742	3.8415	3.8082	3.7743	3.7398	3.7047
7		3.6365	3.5747	3.5107	3.4445	3.4105	3.3758	3.3404	3.3043	3.2674
8		3.3472	3.2839	3.2184	3.1503	3.1152	3.0794	3.0428	3.0053	2.9669
9		3.1373	3.0729	3.0061	2.9365	2.9005	2.8637	2.8259	2.7872	2.7475
10		2.9782	2.9130	2.8450	2.7740	2.7372	2.6996	2.6609	2.6211	2.5801
11		2.8536	2.7876	2.7186	2.6464	2.6090	2.5705	2.5309	2.4901	2.4480
12		2.7534	2.6866	2.6169	2.5436	2.5055	2.4663	2.4259	2.3842	2.3410
13		2.6710	2.6037	2.5331	2.4589	2.4202	2.3803	2.3392	2.2966	2.2524
14		2.6022	2.5342	2.4630	2.3879	2.3487	2.3082	2.2664	2.2229	2.1778
15		2.5437	2.4753	2.4034	2.3275	2.2878	2.2468	2.2043	2.1601	2.1141
16		2.4935	2.4247	2.3522	2.2756	2.2354	2.1938	2.1507	2.1058	2.0589
17		2.4499	2.3807	2.3077	2.2304	2.1898	2.1477	2.1040	2.0584	2.0107
18		2.4117	2.3421	2.2686	2.1906	2.1497	2.1071	2.0629	2.0166	1.9681
19		2.3779	2.3080	2.2341	2.1555	2.1141	2.0712	2.0264	1.9795	1.9302
20		2.3479	2.2776	2.2033	2.1242	2.0825	2.0391	1.9938	1.9464	1.8963
21		2.3210	2.2504	2.1757	2.0960	2.0540	2.0102	1.9645	1.9165	1.8657
22		2.2967	2.2258	2.1508	2.0707	2.0283	1.9842	1.9380	1.8894	1.8380
23		2.2747	2.2036	2.1282	2.0476	2.0050	1.9605	1.9139	1.8648	1.8128
24		2.2547	2.1834	2.1077	2.0267	1.9838	1.9390	1.8920	1.8424	1.7896
25		2.2365	2.1649	2.0889	2.0075	1.9643	1.9192	1.8718	1.8217	1.7684
26		2.2197	2.1479	2.0716	1.9898	1.9464	1.9010	1.8533	1.8027	1.7488
27		2.2043	2.1323	2.0558	1.9736	1.9299	1.8842	1.8361	1.7851	1.7306
28		2.1900	2.1179	2.0411	1.9586	1.9147	1.8687	1.8203	1.7689	1.7138
29		2.1768	2.1045	2.0275	1.9446	1.9005	1.8543	1.8055	1.7537	1.6981
30		2.1646	2.0921	2.0148	1.9317	1.8874	1.8409	1.7918	1.7396	1.6835
35		2.1143	2.0411	1.9629	1.8784	1.8332	1.7856	1.7351	1.6811	1.6226
40		2.0772	2.0035	1.9245	1.8389	1.7929	1.7444	1.6928	1.6373	1.5766
45		2.0487	1.9745	1.8949	1.8084	1.7618	1.7126	1.6599	1.6031	1.5406
50		2.0261	1.9515	1.8714	1.7841	1.7371	1.6872	1.6337	1.5757	1.5115
60		1.9926	1.9174	1.8364	1.7480	1.7001	1.6491	1.5943	1.5343	1.4673
70		1.9689	1.8932	1.8117	1.7223	1.6738	1.6220	1.5661	1.5046	1.4351
80		1.9512	1.8753	1.7932	1.7032	1.6542	1.6017	1.5449	1.4821	1.4107
90		1.9376	1.8613	1.7789	1.6883	1.6389	1.5859	1.5284	1.4645	1.3914
100		1.9267	1.8503	1.7675	1.6764	1.6267	1.5733	1.5151	1.4504	1.3757
120		1.9105	1.8337	1.7505	1.6587	1.6084	1.5543	1.4952	1.4290	1.3519

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1. Please define the mean of IOS [5%] and what are the five most prominent "types" and "drivers" of IOS [10%]? Meanwhile, point out distinctive features between IOS and electronic markets [10%]?
2. In an organization, (1) what are the major categories (including sub-categories) of information resources [10%]? (2) Which resources are managed by whom [5%] and what are the changing role of them due to the extent of outsourcing [10%]?
3. Consider the following claim: "Most information systems seem to be designed specifically to structure work and to eliminate judgment on the part of workers." Cite examples and explain whether you believe this claim about the purpose of most information systems is true. Explain the circumstances under which you believe it is best to structure work even if that reduces workers' ability to exercise judgment. [25%]
4. Why is there a distinction between management information systems and decision support systems? After all, one of the basic purposes of management information systems is to provide information that is used for decision making. [25%]



1. 選擇題(每題 1 分，答錯不倒扣)

1. Which relationship best represents the relationship between the Internet and an intranet?

- a. global - internal
- b. global - local
- c. WAN - LAN
- d. WAN - client/server computing

2. The combination of hardware and operating system software upon which application software is built is called the:

- a. foundation
- b. system structure
- c. architecture
- d. platform

3. A "virtual corporation" is

- a. a company that has been planned on paper, but doesn't really exist yet.
- b. a company that provides virtual reality products, services, and education.
- c. a temporary joint venture where companies form a joint company for a limited time and limited mission.
- d. two or more competitors who have joined to sell a product less expensively than they could individually.

4. Which classification of information systems includes expert systems and artificial neural networks?

- a. decision support systems
- b. executive information or support systems
- c. intelligent support system
- d. office automation systems

5. The conceptualization of the information requirements of the core business of the organization is called the

- a. transaction processing system.
- b. client/server infrastructure.
- c. information architecture.
- d. integrated business requirements matrix.



6. Which of the following is NOT an example of a saboteur's destructive program?
 - a. rolling stone
 - b. Trojan horse
 - c. virus
 - d. worm
7. Which of the following is NOT a major category of BPR support tool?
 - a. visual simulation tools
 - b. flow diagrams
 - c. work analysis tools
 - d. groupware systems
8. Which of the following is NOT a type of interorganizational information system?
 - a. Integrated messaging such as e-mail
 - b. EDI
 - c. EFT
 - d. interactive marketing
9. What is the approach designed to deliver only the information users want or need?
 - a. electronic commerce
 - b. push technology
 - c. client/server technology
 - d. electronic customization
10. The goal of an extranet is to
 - a. directly sell products to consumers.
 - b. foster collaboration between organizations.
 - c. improve collaborate technologies such as videoconferencing.
 - d. develop multimedia push technologies.
11. The purpose of the "Clipper chip" is to provide
 - a. compressed and faster transmissions of Internet data.
 - b. easy access to Federal government data.
 - c. intelligent routing of Internet data.
 - d. encrypted data over public phone lines.



12. An integrated solution to control all major business processes with a single software architecture is referred to as
- enterprise information systems management.
 - enterprise resource planning.
 - computer integrated processing.
 - computer integrated transaction systems.
13. Which of the following attaches itself to documents rather than software applications?
- worm
 - data virus
 - macro virus
 - spider virus
14. In order to take information from several external sources and put it where it is needed, when is needed, and in a usable form, you might use a
- data integrity checker.
 - data quality filter.
 - data warehouse collector.
 - data flow manager.
15. A server-based repository that allows centralized security and control over the data is called (n)
- object-oriented database.
 - data warehouse.
 - data dictionary.
 - normalized relational database.
16. Which of the following is NOT a common data mining technique?
- case-based reasoning
 - neural computing
 - intelligent agents
 - data visualization



17. This IT investment analysis methodology provides a means of rationalizing IT infrastructure investments.
- value analysis
 - information economics
 - management by maxims
 - optional valuation
18. SAP, Computer Associates, and Oracle are major suppliers in which software category?
- mainframe operating systems
 - object-oriented development software
 - project management software
 - enterprise software
19. CISC and RISC are two examples of
- secondary storage device technologies.
 - CD-ROM formats.
 - instruction set strategies.
 - I/O device architectures.
20. The most common local area network data transmission protocol is
- CSMA/CD.
 - FDDI.
 - Token Ring.
 - TCP/IP.



試、配合題 10%：請為下列名詞，從 A-P 中選擇一個最適合的說明

- | | | | | |
|------------------|--------------|---------------------------|-------------|-----------|
| 1. MBONE | 2. bandwidth | 3. delayed teleconference | 4. firewall | 5. OMR |
| 6. alpha testing | 7. parser | 8. multithreading | 9. ESS | 10. ISAPI |

- (A) A computer input method that uses a light source to read special characters and convert them to electrical signals to be sent to the computer.
- (B) A computer input method that uses a light source to recognize marks on paper and convert them to electrical signals to be sent to the computer.
- (C) A computer system that supports manager in decision-making tasks.
- (D) A decision support system for senior-level executives who decision that affect an entire company.
- (E) A real-time group adventure games.
- (F) A specification for transferring information between a World Wide Web server and a CGI program.
- (G) A system which allows several users to type to each other simultaneously.
- (H) A virtual network for exchange of audio and video material.
- (I) Allows different parts of a single program to run concurrently.
- (J) Allows more than one program to run concurrently.
- (K) Testing an individual program by using test data.
- (L) Enables programmers to develop Web-based applications that run much faster than conventional CGI programs.
- (M) Members of the system development team perform early testing to locate and eliminate bugs.
- (N) The ability of a computer's operating system to run several programs concurrently.
- (O) The amount of information that can be transmitted in a given amount of time.
- (P) The participants type, post, and read messages at their convenience.
- (Q) To prevent unauthorized communication and secure sensitive internal data.
- (R) A system would analyze sentence structure and identify each word according to whether it was a subject, verb, or other part of speech.



參、問答題 70%

1. Why is file compression important on the Internet? Please describe lossless compression systems and lossy compression systems. (5%)
2. What are smart cards, and how are they used? (5%)
3. Explain why the public-and private-key system is more secure than a single secret key system. (8%)
4. Describe and contrast two types of parallel processing(i.e. SMP vs. MPP) (6%)
5. Compare and contrast the two-tier client/server model with the three-tier client/server model. (8%)
6. How can companies protect their internal networks from malicious activities when they are connected to the Internet? (10%)
7. 何謂磁碟陣列(RAID)? 其優點為何? (6%)
8. 何謂同位元檢查(parity checking)? (6%)
9. 請分別說明向量式(vector)繪圖軟體與點陣式(bitmap)繪圖軟體的特點。(6%)
10. 請說明 Melissa 病毒如何危害電腦系統。(5%)
11. 有一交通工具出租公司，其資料庫檔案(Rental_Vehicles)如下表，現有一客人欲租用租金在 2000 元以下之路上交通工具，則櫃檯人員該如何使用 SQL 指令，來幫助該顧客找到合適交通工具的牌照號碼(ID)及交通工具種類(Type)? (5%)

Vehicle_ID	Vehicle_Type	Transport_mode	Rental_price
1062	Helicopter	Air	5000
1955	Canoe	Water	500
2784	Automobile	Land	1800
8714	Sailboat	Water	2500
4759	Motorcycle	Land	300
7288	Minivan	Land	2800



1. a) 何謂 Windows 98、Windows NT、Unix 及 Linux ? (2%)
b) 試說明 a)之 4 種作業系統主要之異同處 ? (6%)
2. a) 何謂 K6-2 300 及 Pentium II 300 ? (2%)
b) 試說明個人在購買電腦時，在軟/硬體上應如何考量以選購符合個人需求之電腦呢 ? (6%)
3. a) 何謂 CGI、ASP、ActiveX Control 及 Java Applet ? (4%)
b) 試比較用 a)之 4 種方式來開發 Web-based 應用程式時之優缺點 ? (8%)
4. a) 何謂 Client/Server 架構及 N-tier 架構 ? (4%)
b) 試說明 a)之 2 種方式如何來開發應用程式呢 ? (8%)
5. 隨著網路的功能增強，網路上的商機無限，但其安全性卻是令人裹足不前。試說明目前在加強安全性方面有哪些作法？並簡述各種作法。 (10%)
6. 解釋 Data Abstraction, Abstract Data Type, Inheritance, Polymorphism, Dynamic Binding。 (10%)
7. 系統與系統之間要能夠互動必須要有相互溝通的標準(Standard)，請列舉五種不同特性的標準並簡介之(軟硬體及商業應用皆可)。 (10%)
8. 就 MTS, MIDAS, CORBA 三種中介軟體所提供之相關服務，任選一種詳述其功能特性。 (10%)
9. 就你所參與過且最滿意之系統發展專案回答以下問題：
 - a) 專案簡述，並說明你在專案中所扮演之角色。 (5%)
 - b) 盡你所能解釋所採用之系統分析方法 (如 Yourdon SA, ARIS, LOVEM, OOA, 自創, ...) 之進行步驟及各步驟之產出文件。 (15%)



- 一、試問以下程式之Big-O及Big-Ω為何？並說明之。(10分)

```
piece_of_code (int n)
```

```
{
  while (n > 1)
```

```
  if (n 是奇數的話)
```

```
    n = 3 x n + 1;
```

```
  else
```

```
    n = n / 2;
```

- 二、試用歸納證明法(Induction)，證明Insertion Sort可以做排序工作。(15分)

- 三、何謂Dijkstra's Shortest-Path與Prim's Minimum-Spanning-Tree？它們主要的目的有何不同？(10分)

- 四、試寫一個演算法，決定兩個任意樹是否相同。(15分)

- 五、試寫出BST(Binary Search Tree)之定義；試說明具有10, 20, 30, 40, 45, 50, 52, 55, 60及70等元素之BST最多可畫出幾個；試畫出元素建立順序為40, 20, 60, 10, 30, 50, 70, 45, 55及52之BST，並畫出此BST在刪除元素60後之BST。(10分)

- 六、試說明如何利用Singly Linked Lists，Circularly Linked Lists及Doubly Linked Lists來表示多項式(Polynomial)；試畫出上述三種Linked Lists表示多項式 $f(X) = 10X^6 + 2X^4 - 3X^2 + 4$ 之結構圖；試比較上述三種Linked Lists在表示多項式上的優缺點。(20分)

- 七、假設目前電腦僅有一個大小為N的Array可以使用，但需要m個Queue，每個Queue的大小不等，其大小分別為 N_1, N_2, \dots, N_m 。試說明你將如何來達到此要求呢？並說明你的做法所需N的大小為多少？試以你的做法寫出新增及刪除其中某個Queue之某個元素的演算法。(20分)



1. What typical functionality would be provided by an Object-Relational DBMS? What are the advantages and disadvantages of extending the relational data model this way? (20%)
2. The Web can be used as a platform for providing users with an interface to one or more databases. Discuss the advantages and disadvantages of this approach. (20%)
3. Briefly describe the typical phases of query processing. (10%)
4. 說明下列查詢指令的語意： (10%)
 - a.

```
SELECT DEPARTMENT_NAME, COUNT(*)  
FROM DEPARTMENT AS D, EMPLOYEE AS E  
WHERE D.DEPARTMENT_NUMBER=E.DEPARTMENT_NUMBER AND  
E.SALARY>50000  
GROUP BY DEPARTMENT_NAME  
HAVING COUNT(*)> 5
```
 - b.

```
SELECT EMPLOYEE_NAME  
FROM EMPLOYEE  
WHERE SALARY > ALL(SELECT SALARY FROM EMPLOYEE  
WHERE DEPARTMENT_NUMBER = 5)
```
5. 請作答下列問題：
 - a. 資料庫系統的異動 (transactions) 需要具有哪些特性 (properties)? (8%)
 - b. 資料庫管理系統利用哪些機制，確保系統達到上述的異動特性? (12%)
6. 請作答下列問題：
 - a. 請說明何謂關聯式資料庫的正規劃處理 (normalization process)。 (5%)
 - b. 請利用一個例子，詳細說明正規劃處理的必要性。 (10%)
 - c. 說明正規劃處理的優缺點。 (5%)



- 一、Bill Gates 在其發表新書- 數位神經網路 -提及，八〇年代的主題是品質，九〇年代是企業再造，公元兩千年後的關鍵就是速度，而這些改變主要在數位資訊流動 (the flow of digital information) 的觀念。試問：(25%)
 1. 何謂數位神經網路？
 2. 貴公司的營運管理中，如何利用數位神經網路，強化商業的三大要素：與顧客/夥伴、員工、流程的關係，使得企業轉型與反應更加敏銳？

- 二、在開發資訊系統過程中，資訊專業人員會與管理階層、使用者進行不同的互動行為，以瞭解系統需求。請就貴公司開發資訊系統實例中，試問：(25%)
 1. 延用何種系統開發方法(SDLC、Prototype、Outsourcing) 與程序？其中，資訊專業人員扮演的角色為何？
 2. 採用系統開發的工具為何？其採用考慮因素又為何？

- 三、某一頗具規模之跨國企業，為使各分公司間之資訊能夠流通，並因應公司全球營運的策略需求，責成身為資訊主管的你，向董事會提出資訊系統整合建構計劃。請列出你的計劃內容？假設：該企業不會建立公司專屬之網路。(25%)

- 四、與微軟、英特爾並稱全球資訊科技三大領導公司的思科 (CISCO) 總裁兼執行長錢伯斯，四月七日在台北以「新經濟就是網路經濟」為題發表演說。演說中指出網際網路已掀起新的工業革命，任何停頓在舊時代的企業和個人注定將遭淘汰。請借箸代籌為貴公司擬定因應新時代之道，及資訊部門應作之配合辦理事項？(25%)