國立雲林技術學院 八十三學年度研究所碩士班入學考試試題 所別：工業工程與管理 技術研究所 資訊管理 技術研究所 科目：計算機概論

第一部份 基本觀念題

一. 解釋名詞 (20%)

1. complete partition
2. function dependency
3. concatenated key
4. thrashing
5. multiprogramming
6. open system
7. skewed tree
8. full binary tree
9. circular linked list
10. model base

二. Describe the major difference between the following : (30%)

1. program design vs coding
2. top-down design vs down-top design
3. OOP vs structured programming
4. multiprogramming system vs multitasking system
5. knowledge process vs information process
6. fuzzy set vs neural network
7. breadth-first search vs depth-first search
8. SPSSx vs IFPS
9. JCL vs S. Q. L
10. logical record vs physical record

國立雲林技術學院 所別：工業工程與管理 技術研究所 科目：計算機概論
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第二部份

三. a. Briefly describe the system development life cycle. (8%)
b. Large information systems may take several years to design and implement. Some experts argue that undertaking such a task is ridiculous because the needs of the users and the technology will change so much during the time it takes to implement the system that it will be obsolete before it is implemented. Others point out that there are really no alternatives. What do you think? (7%)

四. a. What is an indexed file? Describe how the index is used to retrieve records from an indexed file. (8%)
b. What is the difference between a database management system and a file management system? (7%)

五. a. Describe how to boot an operating system on a personal computer? (8%)
b. Some users argue that portable operating systems should be avioded because they do not take full advantage of the unique capabilites of a computer. Other users feel that the advantages of using portable operating systems make them a better choice than proprietary operating systms. What do you think? (7%)

六. Discuss the reasons for using a local area network? (5%)

國立雲林技術學院 八十三學年度研究所碩士班入學考試試題 所別：工業工程與管理技術研究所 科目：微積分與線性代數

＊必要之計算過程均須寫在答案卷上，僅寫答案者不予計分

1) 試求

(5%) $\lim_{x \to 0^+} x^{\sin x}$

(5%) $\int_{0^+}^{1} x^n (\ln x)^2 \, dx$

2) (10%)

設 $A = \begin{bmatrix} 1 & -1 & 0 \\ -1 & -1 & 2 \\ 1 & -3 & 4 \end{bmatrix}$ 試求其 LU 表示法(LU Decomposition). L 表 lower triangular, U 表 upper triangular.

3) (10%) 試求羅級數 $\sum_{n=1}^{\infty} n^n x^n$ 的收斂區間.

4) (10%) 給定 $Y = aX^3 + bX^2 + cX + d$ 線性函數通過下列四點 (-1,-1), (0,3), (1,1) 及 (2,-1)，試求 a, b, c, d 的值。

5) (15%) Let A be a 3×3 matrix, each of whose entries (elements) is 1 or 0. What is the largest possible value for $|A| = det(A)$.

6) (15%) 試証明下列定理:
If A is an $n \times n$ matrix, then the following statements are equivalent:
(a) A is invertable.
(b) $AX = 0$ has only trivial solution. X an $1 \times n$ vector, and 0 denotes an $1 \times n$ zeros vector.
(c) A is row equivalent to I_n. I_n denotes an $n \times n$ identity matrix.

7) (15%) 試証明下列定理:
The distance D between a point $p_0(x_0, y_0, z_0)$ and the plane $ax + by + cz + d = 0$ is

$$D = \frac{|ax_0 + by_0 + cz_0 + d|}{\sqrt{a^2 + b^2 + c^2}}$$

8) (15%) 試証明下列定理:(Cauchy-Schware Inequality)
If u and v are vectors in a real inner product space, then

$$\langle u, v \rangle^2 \leq \langle u, u \rangle \langle v, v \rangle$$

國立雲林技術學院 所別：工業工程與管理技術研究所 科目：生產管理
八十三學年度研究所碩士班入學考試試題

1. A manufacturer uses large quantities of a purchased part in his assembly operations. He wants to use a constant purchase lot size, and he specifies that no shortages to be planned. Giving the following data :

a. Annual requirements are 30,000 units which are uniformly required over the year.
b. The fixed cost of placing an order is $70 per order.
c. The Carrying cost per unit per year is 15% of the value of inventory.
d. The storage cost is 10 cents per month per unit of inventory.
e. The purchase cost includes a fixed charge of $20 per order and a charge per unit determined according to the following table.

Order Size	Unit Variable Cost
0≦1,000	1.1
1,000≦3,000	1.05
3,000≦5,000	1.0
5,000≦	0.95

Assumed the form of price discount is using incremental discount, which means the price associated with an interval apply only to the units within that interval. For example, the first 1,000 units will cost $1.1 each; the next (Q-1,000) will cost $1.05 each, and so on. Try to decide the optimal lot size. (25%)

2. Consider the four-job, three-machine scheduling problem in the following table. All job are to be processed first on machine 1, then on machine 2, and last on machine 3. Try to decide a schedule that minimizes the makespan for the four jobs. (25%)

Job	Machine 1	Machine 2	Machine 3
1	9	2	5
2	5	4	6
3	8	1	1
4	6	3	2

3. Consider the three-stage system shown in the following diagram. There is one product produced by each stage. The product of stage 1 is used in the production of products at stages 2 and 3. The product of stage 2 is used in the production of the product at stage 3 and also can be sold directly to customers. The product of stage 3 is sold. Given the following notations :

X_j = Units of production at stage j
P_j = Capacity of stage j in units of product
a_{ij} = Number of units of product at stage i required to produce one unit at stage j
c_j = Unit variable production cost incurred at stage j
r_j = Revenue from the sale of product j, j=2,3

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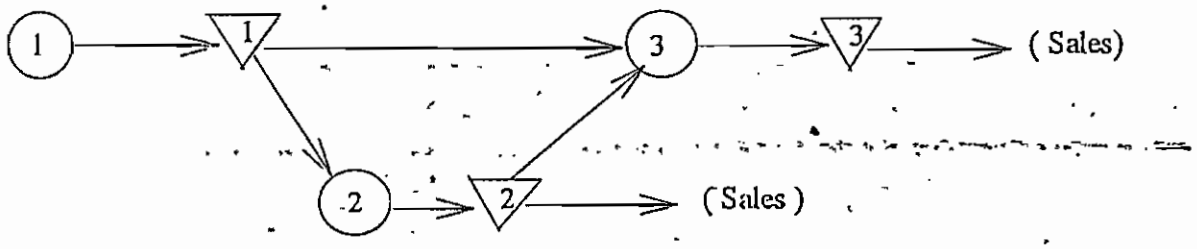
八十三學年度研究所碩士班入學考試試題

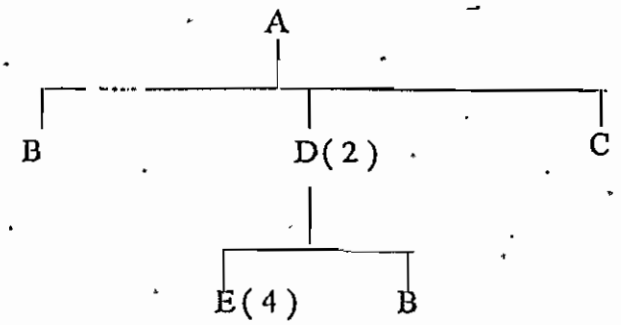
L_j = Minimum sales requirements for product j, j = 2,3
U_j = Maximum sales possible for product j, j = 2,3
Z = Total profit of the system

Try to formulate a linear programming model to decide the unit of production at each stage (Xj) with the objective function to maximize the value of Z. (25%)



4. Assumed the computer of a company breakdown just after it generated the following information : Planned order release for item E = 500 units in week three. The company can reconstruct all the information they lost except the master schedule for end product A. The company is fortunate because item E is used only in A. Given the following product structure tree and associated inventory status record information, determine what master schedule entry for A was exploded into the material requirement plan that killed the computer. (25%)

Part #	On hand Inventory	Lot size	Lead time
A	0	Lot-for lot	1 week
B	60	100	2 week
C	100	Lot-for-lot	1 week
D	50	Lot-for-lot	2 week
E	30	Lot-for-lot	1 week



國立雲林技術學院 八十三學年度研究所碩士班入學考試試題 所別：工業工程與管理技術研究所 科目：作業研究

＊必要之計算過程均須寫在答案卷上，僅寫答案者不予計分

1. (25%) The starting and current tableaux of a given LP problem are shown. Find the values of the unknowns *a* through *l*.

Starting Tableau

z	x_1	x_2	x_3	x_4	x_5	RHS
1	a	1	-3	0	0	0
0	b	c	d	1	0	6
0	-1	2	e	0	1	1

Current Tableau

z	x_1	x_2	x_3	x_4	x_5	RHS
1	0	-1/3	j	k	*l*	-4
0	g	2/3	2/3	1/3	0	f
0	h	i	-1/3	1/3	1	3

2. (1) (7%) Provide your reasoning to support that all basic variables in every basic feasible solution of a transportation problem also have integer values (where every supply and demand has an integer value).

(2) (18%) A food company has three plants producing a certain product that is to be shipped to three distribution centers. Plants 1, 2 and 3 produce 35, 30 and 25 shipments per month, respectively. Each distribution center needs to receive at least 20 shipments per month. The cost for each shipment from each plant to the respective distributing centers is given as follows:

	Distribution Center 1	2	3
Plant 1	12	10	4
Plant 2	10	14	8
Plant 3	7	6	9

(2a) Formulate this problem as a transportation problem by constructing the appropriate cost and requirements table.

(2b) Find an initial basic feasible solution and perform an iteration to find the next feasible solution.

(2c) Formulate this problem as a minimum cost flow problem (using network representation).

3. (25%) 雲林地區早上下雨的機率為 p，下午下雨的機率為 q, $p+q$ 不須等於 1，且此兩事件相互獨立(independent)。楊老師每日上午由家至研究室上班，下午由研究室回家。楊老師有兩把雨傘，若出門時下雨則攜帶一把(由家至研究室或由研究室至家)若不下雨則不攜帶傘。若由家(研究室)出門時下雨而沒有雨傘，兩把雨傘都在研究室(家)，楊老師只好淋雨。Formulate 此一問題成一 Markov Chain，並計算楊老師上午由家至研究室上班的期望淋雨機率。

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八十三學年度研究所碩士班入學考試試題

4. (1) (10%) What are the key assumptions of the birth-and-death process? Why are these assumptions important for queueing models?

(2) (15%) An emergency room of a hospital has one doctor. Patients who need emergency service arrive according to a Poisson process at a mean rate of 12 per hour. However, if the doctor already is being used, these potential customers (patients) may balk (drive on to another hospital). In particular, if there are n patients already at the emergency room, the probability that an arriving potential customer will balk is n/3 for n= 1,2,3. The time required to serve a patient has an exponential distribution with a mean of 5 minutes.

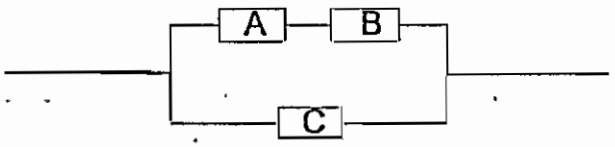
國立雲林技術學院 所別：工業工程與管理科技研究所 科目：機率與統計
八十三學年度研究所碩士班入學考試試題

1. Two firms A and B consider bidding on a road-building job, which may or may not be awarded depending on the amounts of the bids. Firm A submits a bid and the probability is 3/4 that it will get the job provided firm B does not bid. The odds are 3 to 1 that B will bid, and if it does, the probability that A will get the job is only 1/3.

   (a) What is the probability that A will get the job? (5%)
   (b) If A gets the job, what is the probability that B did not bid? (5%)

2. The purchasing department of a manufacturing company is planning to order some material for the production in the next 30 weeks. From the past experience, the weekly usage of the material is i.i.d. uniform random variables between 35 and 65 units. *At least* how many units should the company order so that the probability of shortage (the order quantity is not enough for production) is smaller than 5%? How should the probability be interpreted? (10%).

3. A circuit system consists of 3 independent components as shown in the following diagram:



   The system functions well if either both A and B are good or C is good. Suppose the life of the 3 components are exponentially distributed with means $1/\beta_A$, $1/\beta_B$, and $1/\beta_C$, respectively. Determine the p.d.f. of the *system life*. (10%)

4. Suppose customers arrive at a bank according to a Poisson process with a mean rate λ.

   (a) List the conditions for the arrival process to be a Poisson process. (3%)
   (b) Derive the probability density function for the time interval between any two successive arrivals. Prove your result. (7%)

5. Let $f(x|\theta) = (1/\theta)x^{(1-\theta)/\theta}, 0 < x < 1, 0 < \theta < \infty$.
   (a) Derive the maximum likelihood estimator of θ.(5%)
   (b) Is the estimator unbiased ? (10%)

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6. The production department of an electronic company is to estimate the mean time between failure (MTBF) of a newly designed equipment. The management wants to construct a 90% confidence interval for the MTBF with a confidence halfwidth no larger than 2/5 of the sample standard deviation.

(a) What is the sample size required? Specify the assumptions that you need. (5%)
(b) Based on the sample size determined in (a), experiments are conducted. Suppose the sample mean turns out to be 1200 hours and the sample standard deviation is 20 hours. Construct a 90% confidence interval for the MTBF. (2%)
(c) How would you interpret the 90% confidence interval that you got in (b)? (3%)

7. If the null hypothesis $\mu = \mu_0$ is to be tested on the basis of a large random sample against the alternative hypothesis $\mu < \mu_0$ (or $\mu > \mu_0$) and the probability of a Type I error is to be α and the probability of a Type II error is to be β for $\mu = \mu_1$. Show that the required sample size is :

$$n = \frac{\sigma^2 (Z_\alpha + Z_\beta)^2}{(\mu_1 - \mu_0)^2}$$

where σ^2 is the variance of the population. (15%)

8. A study is being made of the failures of an electronic component. There are four types of failures possible and two mounting positions for the device. It is suspected that there is a certain relation between failure types and mounting positions. The following data have been taken:

Mounting Position	Failure Type A	B	C	D
1	22	46	18	9
2	4	17	6	12

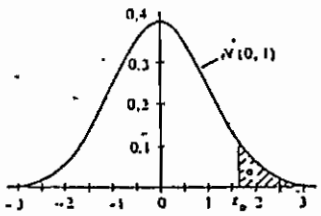
(a) Formulate the problem. (5%)
(b) Perform a statistical test on the problem using a significance level of 0.05. What's your conclusion? (5%)

9. (a) How do we check the adequacy of a fitted regression model? (5%)
(b) What is the coefficient of determination R^2? How should it be interpreted? (5%)

資料A

國立雲林技術學院 八十三學年度研究所碩士班入學考試試題 所別：工業工程與管理技術研究所 科目：機率與統計

The Normal Distribution

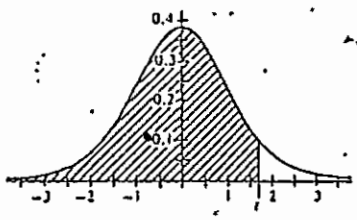


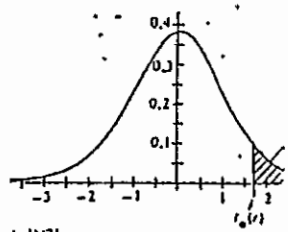
$P(Z > t_\alpha) = \alpha$

$P(Z > z) = 1 - \Phi(z) = \Phi(-z)$

t_α	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641
0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451
0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183
2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143
2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110
2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084
2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064
2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048
2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036
2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026
2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019
2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014
3.0	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011	0.0010	0.0010
3.1	0.0010	0.0009	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0007	0.0007
3.2	0.0007	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005
3.3	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0003
3.4	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002

The t Distribution





$$P(T \le t) = \int_{-\infty}^{t} \frac{\Gamma[(r+1)/2]}{\sqrt{\pi r}\,\Gamma(r/2)(1+w^2/r)^{(r+1)/2}}\,dw$$

$$P(T \le -t) = 1 - P(T \le t)$$

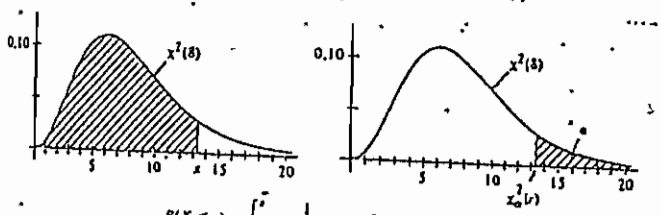
	$P(T \le t)$ = 0.60	0.75	0.90	0.95	0.975	0.99
r	$t_{0.40}(r)$	$t_{0.25}(r)$	$t_{0.10}(r)$	$t_{0.05}(r)$	$t_{0.025}(r)$	$t_{0.01}(r)$
1	0.325	1.000	3.078	6.314	12.706	31.821
2	0.289	0.816	1.886	2.920	4.303	6.965
3	0.277	0.765	1.638	2.353	3.182	4.541
4	0.271	0.741	1.533	2.132	2.776	3.747
5	0.267	0.727	1.476	2.015	2.571	3.365
6	0.265	0.718	1.440	1.943	2.447	3.143
7	0.263	0.711	1.415	1.895	2.365	2.998
8	0.262	0.706	1.397	1.860	2.306	2.896
9	0.261	0.703	1.383	1.833	2.262	7.821
10	0.260	0.700	1.372	1.812	2.228	2.764
11	0.760	0.697	1.363	1.796	2.201	2.718
12	0.259	0.695	1.356	1.782	2.179	2.681
13	0.259	0.694	1.350	1.771	2.160	2.650
14	0.258	0.692	1.345	1.761	2.145	2.624
15	0.258	0.691	1.341	1.753	2.131	2.602
16	0.258	0.690	1.337	1.746	2.120	2.583
17	0.257	0.689	1.333	1.740	2.110	2.567
18	0.257	0.688	1.330	1.734	2.101	2.552
19	0.257	0.688	1.328	1.729	2.093	2.539
20	0.257	0.687	1.325	1.725	2.086	2.528
21	0.257	0.686	1.323	1.721	2.080	2.518
22	0.256	0.686	1.321	1.717	2.074	2.508
23	0.256	0.685	1.319	1.714	2.069	2.500
24	0.256	0.685	1.318	1.711	2.064	2.492
25	0.256	0.684	1.316	1.708	2.060	2.485
26	0.256	0.684	1.315	1.706	2.056	2.479
27	0.256	0.684	1.314	1.703	2.052	2.475
28	0.256	0.683	1.313	1.701	2.048	2.467
29	0.256	0.683	1.311	1.699	2.045	2.462
30	0.256	0.683	1.310	1.697	2.042	2.457
∞	0.253	0.674	1.282	1.645	1.960	2.326

資料B

國立雲林技術學院 所別：工業工程與管理技術研究所 科目：機率與統計

八十三學年度研究所碩士班入學考試試題

The Chi-Square Distribution



$$P(X \le x) = \int_0^x \frac{1}{\Gamma(r/2)2^{r/2}} w^{r/2-1} e^{-w/2}\, dw$$

	$P(X \le x)$							
	0.010	0.025	0.050	0.100	0.900	0.950	0.975	0.990
r	$\chi^2_{0.99}(r)$	$\chi^2_{0.975}(r)$	$\chi^2_{0.95}(r)$	$\chi^2_{0.90}(r)$	$\chi^2_{0.10}(r)$	$\chi^2_{0.05}(r)$	$\chi^2_{0.025}(r)$	$\chi^2_{0.01}(r)$
1	0.000	0.001	0.004	0.016	2.706	3.841	5.024	6.635
2	0.020	0.051	0.103	0.211	4.605	5.991	7.378	9.210
3	0.115	0.216	0.352	0.584	6.251	7.815	9.348	11.34
4	0.297	0.484	0.711	1.064	7.779	9.488	11.14	13.28
5	0.554	0.831	1.145	1.610	9.236	11.07	12.83	15.09
6	0.872	1.237	1.635	2.204	10.64	12.59	14.45	16.81
7	1.239	1.690	2.167	2.833	12.02	14.07	16.01	18.48
8	1.646	2.180	2.733	3.490	13.36	15.51	17.54	20.09
9	2.088	2.700	3.325	4.168	14.68	16.92	19.02	21.67
10	2.558	3.247	3.940	4.865	15.99	18.31	20.48	23.21
11	3.053	3.816	4.575	5.578	17.28	19.68	21.92	24.72
12	3.571	4.404	5.226	6.304	18.55	21.03	23.34	26.22
13	4.107	5.009	5.892	7.042	19.81	22.36	24.74	27.69
14	4.660	5.629	6.571	7.790	21.06	23.68	26.12	29.14
15	5.229	6.262	7.261	8.547	22.31	25.00	27.49	30.58
16	5.812	6.908	7.962	9.312	23.54	26.30	28.84	32.00
17	6.408	7.564	8.672	10.08	24.77	27.59	30.19	33.41
18	7.015	8.231	9.390	10.86	25.99	28.87	31.53	34.80
19	7.633	8.907	10.12	11.65	27.20	30.14	32.85	36.19
20	8.260	9.591	10.85	12.44	28.41	31.41	34.17	37.57
21	8.897	10.28	11.59	13.24	29.62	32.67	35.48	38.93
22	9.542	10.98	12.34	14.04	30.81	33.92	36.78	40.29
23	10.20	11.69	13.09	14.85	32.01	35.17	38.08	41.64
24	10.86	12.40	13.85	15.66	33.20	36.42	39.36	42.98
25	11.52	13.12	14.61	16.42	34.38	37.65	40.65	44.31
26	12.20	13.84	15.38	17.29	35.56	38.88	41.92	45.64
27	12.88	14.57	16.15	18.11	36.74	40.11	43.19	46.96
28	13.56	15.31	16.93	18.94	37.92	41.34	44.46	48.28
29	14.26	16.05	17.71	19.77	39.09	42.56	45.72	49.59
30	14.95	16.79	18.49	20.60	40.26	43.77	46.98	50.89
40	22.16	24.43	26.51	29.05	51.80	55.76	59.34	63.69
50	29.71	32.36	34.76	37.69	63.17	67.50	71.42	76.15
60	37.48	40.48	43.19	46.46	74.40	79.08	83.30	88.38
70	45.44	48.76	51.74	55.33	85.53	90.53	95.02	100.4
80	53.54	57.15	60.39	64.28	96.58	101.9	106.6	112.3

國立雲林技術學院 所別：工業工程與管理技術研究所 科目：工程數學
八十三學年度研究所碩士班入學考試試題

1. Find the general solution of $2xyy' - y^2 + x^2 = 0$. (10pt)

2. Find the eigenvalues and eigenvectors of the following matrix: (12pt)

$$\begin{bmatrix} 6 & 8 \\ 8 & -6 \end{bmatrix}$$

3. Solve the following problem by two different methods: (20pt)

$$y'' + 4y' + 3y = 0,$$
$$y(0) = 3,\ y'(0) = 1$$

4. A Laplace transform of $f(t)$ is $F(s) = \dfrac{1}{s^2(s-a)}$, find $f(t)$. (12pt)

5. Solve the following initial value problem: (15pt)

$$y_1' = 4y_1 - 2y_2$$
$$y_2' = y_1 + y_2$$
$$y_1(0) = 3$$
$$y_2(0) = 2$$

6. Prove that the Laplace transform of a piecewise continuous periodic function $f(t)$ of period p is $L(f) = \dfrac{1}{1-e^{-ps}} \int_0^p e^{-st} f(t)\,dt$. (15pt)

7. What is the Fourier series for a periodic function $f(t)$ of period T? What is the conditions for the existence of Fourier series? What is the Fourier transform of a function $f(t)$? Is there any relationship between Fourier series and Fourier transform? (16pt)

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Table 1: Some Elementary Functions $f(t)$ and Their Laplace Transform $L(f)$

	$f(t)$	$L(f)$		$f(t)$	$L(f)$
1	1	$1/s$	6	e^{at}	$\frac{1}{s-a}$
2	t	$1/s^2$	7	$\cos \omega t$	$\frac{s}{s^2+\omega^2}$
3	t^2	$2!/s^3$	8	$\sin \omega t$	$\frac{\omega}{s^2+\omega^2}$
4	t^n $(n=1,2,\ldots)$	$\frac{n!}{s^{n+1}}$	9	$\cosh at$	$\frac{s}{s^2-a^2}$
5	t^a (a positive)	$\frac{\Gamma(a+1)}{s^{a+1}}$	10	$\sinh at$	$\frac{a}{s^2-a^2}$

國立雲林技術學院 八十三學年度研究所碩士班入學考試試題

所別：工業工程與管理 技術研究所 資訊管理 技術研究所

科目：計算機概論

第一部份 基本觀念題

一. 解釋名詞 (20%)

1. complete partition
2. function dependency
3. concatenated key
4. thrashing
5. multiprogramming
6. open system
7. skewed tree
8. full binary tree
9. circular linked list
10. model base

二. Describe the major difference between the following : (30%)

1. program design vs coding
2. top-down design vs down-top design
3. OOP vs structured programming
4. multiprogramming system vs multitasking system
5. knowledge process vs information process
6. fuzzy set vs neural network
7. breadth-first search vs depth-first search
8. SPSSx vs IFPS
9. JCL vs S. Q. L
10. logical record vs physical record

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第二部份

三. a. Briefly describe the system development life cycle. (8%)

b. Large information systems may take several years to design and implement. Some experts argue that undertaking such a task is ridiculous because the needs of the users and the technology will change so much during the time it takes to implement the system that it will be obsolete before it is implemented. Others point out that there are really no alternatives. What do you think? (7%)

四. a. What is an indexed file? Describe how the index is used to retrieve records from an indexed file. (8%)

b. What is the difference between a database management system and a file management system? (7%)

五. a. Describe how to boot an operating system on a personal computer? (8%)

b. Some users argue that portable operating systems should be avioded because they do not take full advantage of the unique capabilites of a computer. Other users feel that the advantages of using portable operating systems make them a better choice than proprietary operating systms. What do you think? (7%)

六. Discuss the reasons for using a local area network? (5%)