150-1

淡江大學96學年度碩士班招生考試試題

系別：管理科學研究所　　　　科目：生產與作業管理

准帶項目請打「V」	
✓	簡單型計算機

本試題共 3 頁

本試題雙面印製

本考試使用時間爲 90 分鐘，請盡力作答，並注意時間的控制！！

I. Definitions of Terms (2% each, 20% total)

1.1) Operations management

1.2) Order qualifier

1.3) Centered moving average

1.4) Delayed differentiation

1.5) Bottleneck operation

1.6) Production layout

1.7) Outsourcing

1.8) Process yield

1.9) Chase demand strategy

1.10) Yield management

II. Problems (80%)

2.1) Given the demand data that follow, prepare a naïve forecast for periods 2 through 10. Then determine each forecast error, and use those values to obtain $2s$ control limits. If the demand in the next two periods turns out to be 125 and 130, can you conclude that the forecasts are in control? (5% each, 10% total)

Period:	1	2	3	4	5	6	7	8	9	10
Demand:	118	117	120	119	126	122	117	123	121	124

2.2) A major television manufacturer has determined that its 19-inch color TV picture tubes have a mean service life that can be modeled by a normal distribution with a mean of six years and a standard deviation of one-half year.

(a) What probability can you assign to service lives of at least (1) Five years? (2) Six years? (3) Seven and one-half years? (5%)

(b) If the manufacturer offers service contracts of four years on these picture tubes, what percentage can be expected to fail from wear-out during the service period? (5%)

2.3) Skinner's Fish Market buys fresh Boston bluefish daily for \$4.20 per pound and sells it for \$5.70 per pound. At the end of each business day, any remaining bluefish is sold to a producer of cat food for \$2.40 per pound. Daily demand can be approximated by a normal distribution with a mean of 80 pounds and a standard deviation of 10 pounds. What is the service level and the optimal stocking level? (5% each, 10% total)

2.4) A manufacturer of exercise equipment purchases the pulley section of the equipment from a supplier who lists these prices: less than 1,000, \$5 each; 1,000 to 3,999, \$4.95 each; 4,000 to 5,999, \$4.90; and 6,000 and more, \$4.85 each. Ordering costs are \$50, annual carrying costs per unit are 40 percent of purchase cost, and annual usage is 4,900 pulleys. Determine an order quantity that will minimize total cost. (10%)

◀注意背面尚有試題▶

淡江大學96學年度碩士班招生考試試題

系別：管理科學研究所　　　　科目：生產與作業管理

准帶項目請打「V」	
	簡單型計算機

本試題共 3 頁

2.5) Assume that you are the manager of a shop that assembles power tools. You have just received an order for 50 chain saws, which are to be shipped at the start of week 8. Pertinent information on the saws is:

Item	Lead time (weeks)	On Hand	Components
Saw	2	15	A(2), B(1), C(3)
A	1	10	E(3), D(1)
B	2	5	D(2), F(3)
C	2	30	E(2), D(2)
D	1	20	
E	1	10	
F	2	30	

a) Develop a product structure tree, and assembly time chart, and a master schedule. (5%)
b) Develop the material requirements plan for component E using lot-for-lot ordering. (5%)
c) Suppose now that capacity to produce part E is limited to a maximum of 100 units per period. Revise the planned-order releases for periods 1-4 so that the maximum is not exceeded in any period, keeping in mind an objective of minimizing carrying costs. The quantities need not be equal in every period. Note that the gross requirements for E will remain the same. However, quantities in some of the other rows will change. Determine the new cell values for those rows. (5%)

2.6) The following table contains information concerning four jobs that are awaiting processing at a work center.

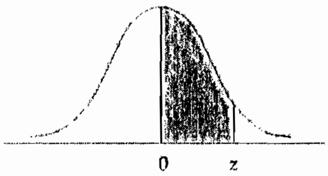
Job	Job Time (days)	Due Date (days)
A	14	20
B	10	16
C	7	15
D	6	17

a) Sequence the jobs using (i) FCFS, (ii) SPT, (iii) EDD, and (iv) CR. Assume the list is by order of arrival. (4%)
b) For each of the methods in part a, determine (i) the average job flow time, (ii) the average tardiness, and (iii) the average number of jobs at the work center. (3% each)
c) Is one method superior to the others: Explain. (2%)

150-27 NormalTable3.JPG 請使用本表!! 第3頁

Table 3

Normal Probabilities



z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

SOURCE: Abridged from Table 1 of A. Hald, *Statistical Tables and Formulas* (New York: Wiley & Sons, Inc.), 1952. Reproduced by permission of A. Hald and the publisher, John Wiley & Sons, Inc.