一. 選擇題（單選）(30%)

1. 下列何者適合作為對整體存貨管理的績效評估項目？
   A. 現有庫存數（on hand）
   B. 現有庫存金額
   C. 存貨週轉率（inventory turn）
   D. 某一工單的缺貨項目

2. 依依途程資料展開用料需求所作的產能計劃（capacity planning）是下列何者？
   A. 粗略產能計劃（rough-cut capacity planning）
   B. 資源規劃（resource planning）
   C. 產能需求計劃（capacity requirements planning）
   D. 投入/產出控制（input/output control）

3. 在一個生產線某一個瓶頸站（bottleneck work center）之前的生產作業，應該如何做排程較適合？
   A. 有空時應儘早生產。已被瓶頸站不時之需
   B. 應充分利用既有的產能，以提高效率
   C. 應依照訂單的緊急優先順序生產
   D. 應依照瓶頸站的生產率做排程

4. 產能需求計劃（CRP）資源需求規劃（MRP）兩者之間的關係就好比下列何者？
   A. 生產計劃（production plan）和生產排程（MPS）
   B. 物料需求計劃（MRP）和產銷計劃（sales and operation plan）
   C. 投入/產出控制（input/output control）和產能需求計劃（CRP）
   D. 派工單（dispatch list）和物料需求計劃

5. 確定訂單（firm planned order）的功能是做到下列何者？
   i) 防止物料需求計劃（MRP）系統自動發出訂單
   ii) 凍結（freezing）某一個計劃訂單發出的時機（timing）
   iii) 產生的計劃訂單其數量可以不依照該項目的批量法（lot sizing）
   iv) 防止更低階（low levels）項目需求的展開
   A. i
   B. ii 和 iii
   C. i，ii 和 iii
   D. i，ii，iii 和 iv

6. 下列何者不是物料需求計劃（MRP）系統的輸出（output）？
   A. 派工單（dispatch list）
   B. 發出訂單（released orders）
   C. 訂單重排程（rescheduled orders）
   D. 取消訂單（cancel orders）

7. 如果有一個訂單需要 A 項存貨 100 個，目前的庫存是 40 個，則相差的 60 個是下列何者？
   A. 淨需求（net requirement）
   B. 毛需求（gross requirement）
   C. 可用存數（available inventory）
   D. 再訂單點(reorder point)

8. 某公司對其一存貨項目，使用 EOQ 控制。此產品的年需求量為 10,000，單位生產成本為 $10，其生產的固定整備成本為 $50，庫存成本估計為產品成本的 10%，前置時間為十個工作天（假設一年有 250 個工作天）。此公司的定購點應為多少？

A. 200
B. 300
C. 400
D. 500

9. 下列批量決策，何者可以減少 MRP 的系統敏感？
A. 在 BOM 上層用固定訂單數量
B. 在 BOM 中層用批對批
C. 在 BOM 下層用固定訂單期間
D. 以上皆是

10. 下列何者為非 TOC 管理思維
A. 有效產出的世界
B. 忙碌的工廠不等於有效率的工廠
C. 自動化設備一定可以提高生產力
D. 常識管理

二. (8%) Assume that 50 units of an item are produced at a cumulative average cost of $20 per unit. Suppose that we want to compute the learning percentage when 100 units are produced at a cumulative average cost of $15 per unit. What is the learning rate? (Hint: Wright formula $A_x = C_1 x^b$ where A_x = cumulative average cost of producing x unit, C_1 = cost of the first unit, b = the learning curve exponent)

三. (8%) 某公司對其一存貨項目之需求並非固定，而是隨機的。由過去的銷售紀錄統計得知，每日的需求平均值為 40，標準差為 10。假設此公司的服務水準訂為 99%，試求最適訂購點。(Hint: 參見附錄表)

四. (12%) Given the following data, apply the DCA (Direct Clustering Algorithm) technique to determine what machine should be grouped together as one or more cells.

		Part number							
		1	2	3	4	5	6	7	8
Machine number	1	1					1		
	2		1	1		1			1
	3			1		1			1
	4				1				
	5	1					1		
	6		1	1		1			
	7				1		1		

五. (12%) Weekly sales of pizzas at Hot Pizza are shown following:

Week	Demand ($)	Week	Demand ($)	Week	Demand ($)
1	108	5	96	9	112
2	116	6	119	10	102
3	118	7	96	11	92
4	124	8	102	12	91

Estimate demand for the next four weeks using a four-week moving average as well as simple exponential smoothing with α =0.1. Evaluate the MAD, MAPE, MSE in each case. Which of the two methods would you prefer?

六. (8%) Weekly demand for product Palm is normally distributed with a mean of 2,500 and a standard deviation of 500. The replenishment lead-time is two weeks. Assume that the demand is independent from one week to the next. Evaluate the service level from a policy of ordering 10,000 Palms when there are 6,000 Palms in inventory. (Hint: 參見附錄表)

七. (14%) Consider the following distribution system:

- Single product
- Two plants, referred to as plant $p1$ and $p2$.
- Plant $p2$ has an annual capacity of 60,000 units.
- The two plants have the same production costs.
- Two existing warehouses, referred to as warehouse $w1$ and warehouse $w2$, have identical warehouse handling costs.
- Three market areas, $c1$, $c2$, and $c3$, with demands of 50,000, 100,000 and 50,000, respectively.
- Distribution cost per unit is as follows. For instance, distributing one unit from plant $p1$ to warehouse $w2$ cost \$5.

	$p1$	$p2$	$c1$	$c2$	$c3$
$w1$	0	4	3	4	5
$w2$	5	2	2	1	2

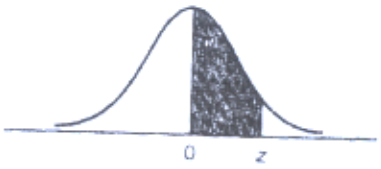
Our objective is to find a distribution strategy that specifies the flow of products from the suppliers through the warehouses to the market areas without violating the plant $p2$ capacity constraint, that satisfies market area demands, and that minimizes total distribution costs. Formulate the problem by mathematical programming method to find its optimal solution. You do not need to solve the numerical results.

八. (8%) Explain how two-card kanban works in a typical JIT literature. You should provide a conceptual schema to illustrate your idea.

(背面仍有題目,請繼續作答)

附錄表

TABLE 4 Normal Curve Areas



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

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