國立臺灣科技大學

115學年度碩士班招生

試題

系所組別：0120工業管理系碩士班乙組

科　　目：生產管理

<<501203>>

國立臺灣科技大學115學年度碩士班招生試題

系所組別： 工業管理系碩士班乙組

科　　目： 生產管理

(總分為100分;所有試題務必於答案卷內頁依序作答)

1. (20%) Multiple choice questions (單選題)

1,1 (5%) Which statement correctly distinguishes productivity from efficiency?

A. Productivity measures on-time delivery performance, while efficiency measures employee satisfaction

B. Productivity is the ratio of output to input, while efficiency measures how close actual output is to a standard.

C. Productivity focuses only on labor input, while efficiency focuses only on machine utilization

D. Productivity is measured in percentages, while efficiency is measured in units per hour

1.2 (5%) Delayed differentiation (postponement) is a key practice for balancing high-volume production and customization. Which option correctly describes this concept?

A. Finalize all custom features at the start to reduce downstream changes.

B. Produce a standardized "base" product in advance, then delay final customization/configuration until specific customer requirements are known.

C. Delay all production activities (including base production) until an order arrives to avoid inventory.

D. Customize every unit from the beginning with no common components to maximize uniqueness.

1.3 (5%) What best describes effective capacity?

A. The highest possible output assuming no breakdowns or delays

B. The average output actually produced over a given period

C. The expected maximum output rate after accounting for routine interruptions such as maintenance and setup

D. The lowest output level required to keep operations running

1.4 (5%) Available-to-promise (ATP) is best defined as:

A. Inventory that has already been allocated to existing customer orders

B. Inventory that can be committed to future customer orders after accounting for current commitments

國立臺灣科技大學115學年度碩士班招生試題

系所組別： 工業管理系碩士班乙組

科　　目： 生產管理

(總分為100分;所有試題務必於答案卷內頁依序作答)

C. Inventory held exclusively as safety stock

D. Inventory that is obsolete or awaiting disposal

2. (15%) An e-commerce warehouse's Picking + Packing team ran a 6-week staffing test ahead of the peak season. Because mis-picks or missed items lead to rework, the team supervisor evaluates labor productivity using good output (effective throughput) instead of total completed orders.

Definitions

Good output (orders) = Completed orders in the week − Rework orders in the week

Labor input (labor-hours) = Crew size × Weekly hours per worker

Labor productivity = Good output ÷ Labor input (unit: good orders per labor-hour)

Week	Crew size	Weekly hours per worker	Completed orders	Rework orders
1	3	36	3420	120
2	4	36	4560	180
3	5	36	5250	300
4	6	32	5520	420
5	4	40	4880	160
6	3	40	4080	120

2.1 (8 %) Compute the *Good output*, *Labor input* and *Labor productivity* for each week.

2.2 (7 %) Based on the calculations above, do you agree that adding more people **does not** necessarily increase productivity? Provide a reasonable managerial interpretation.

國立臺灣科技大學115學年度碩士班招生試題

系所組別： 工業管理系碩士班乙組

科　　目： 生產管理

(總分為100分;所有試題務必於答案卷內頁依序作答)

3. (15%) A café is deciding whether to purchase one or two espresso machines for the peak season; each machine can serve up to 80 drinks per day, the café sells drinks for $25 with a $10 variable cost per drink, the daily fixed cost is $600 with one machine or $1,000 with two machines, and any demand beyond capacity is turned away (no revenue and no variable cost). Please determine:

   3.1 (8%) Find the break-even daily demand (number of drinks) for each option (1 machine and 2 machines).

   3.2 (7%) If forecast demand is between 90 and 120 drinks per day, which option should the café choose to maximize profit?

4. (10%) Material Requirements Planning (MRP) is a cornerstone of Enterprise Resource Planning (ERP). Based on the three primary inputs—the Master Production Schedule (MPS), the Bill of Materials (BOM), and the Inventory Status File—please explain how the system derives the timing and quantity of requirements for components at each level through the processes of multi-level explosion, net requirement calculation, and lot sizing. Explain in detail.

5. (20%) Mass Customization is one of the core strategies for enhancing enterprise competitiveness in the era of smart manufacturing.

   A. What are the core spirit and values of Mass Customization? (10 points)

   B. How do smart manufacturing technologies empower and substantively support the implementation and optimization of Mass Customization? (10 points)

6. (20%) A company produces a specific component with an annual demand of 24,000 units. The component is manufactured using in-house equipment at a production rate of 6,000 units per month. The setup cost per production run is NT$4,800, and the annual holding cost per unit is NT$12. Calculate the following:

   A. Economic production quantity (EPQ), the number of production batches per year, the production time per cycle, the total cycle time, and the total annual cost (excluding purchasing costs). (10 points)

   B. If the company increases its production rate to 8,000 units per month, please recalculate the EPQ and compare the results. (10 points)