UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION
SEPTEMBER 2013 SESSION

SUBJECT CODE : FIB36402
SUBJECT TITLE : PRODUCTION AND OPERATION MANAGEMENT
LEVEL : BACHELOR
TIME / DURATION : ( 2.5 HOURS )
DATE :

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. Please write your answers on the answer booklet provided.
4. Answer should be written in blue or black ink except for sketching, graphic and illustration.
5. This question paper consists of TWO (2) sections. Section A and B. Answer all questions in Section A. For Section B, answer two (2) question only.
6. Answer all questions in English.

THERE ARE 7 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.
SECTION A (Total: 60 marks)

INSTRUCTION: Answer ALL questions.
Please use the answer booklet provided.

Question 1

(a) Explain the production and operation management concept. (6 marks)

(b) List three, (3) and briefly discuss why productivity matters? (6 marks)

(c) What are the consequences of poor forecasts? Explain. (4 marks)

(d) Describe the characteristics of “A restaurant meal” by using the dimension of quality. (5 marks)

Question 2

(a) A distributor uses 500 packing crates a month, which it purchases at a cost of RM 20 each. The manager has assigned an annual carrying cost of 40% of the purchase price per crate. Ordering costs are RM 28. Currently the manager order once a month. How much could the firm save annually in ordering and carrying costs by using the EOQ? (6 marks)

(b) Briefly discuss the advantages and disadvantages of the strategy of maintaining a level rate of output level and let inventories absorb fluctuation in demand (4 marks)
(c) Product A is made of one B assembly, two C assemblies, and one D assembly. Each B assembly is made of two E and three F parts. Each C assembly is made of one G and three H subassemblies. Each D assembly is made of two K parts. Each G subassembly is made of one E part. Each H subassembly is made of two F parts.

i. Construct a product structure tree for product A. (4 marks)

ii. Prepare an intended bill of material for product A. (5 marks)

Question 3

(a) Discuss the advantages of implementing JIT in production system. (10 marks)

(b) Explain why we need line balancing. (4 marks)

(c) The frequency of breakdown of a piece of equipment per month is shown in the table. The cost of a breakdown is RM 1,000 and the cost of preventive maintenance is RM 2,000 per month. Assume that the equipment breakdown can be avoided if preventive maintenance is performed. Should the manager use preventive maintenance, or would it be better to fix the equipment when it breaks down?

Table 1: Equipment Breakdown

<table>
<thead>
<tr>
<th>Number of breakdowns</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability</td>
<td>0.10</td>
<td>0.15</td>
<td>0.20</td>
<td>0.30</td>
<td>0.15</td>
<td>0.10</td>
</tr>
</tbody>
</table>

(6 marks)
SECTION B (Total: 40 marks)

INSTRUCTION: Answer only TWO questions. Please use the answer booklet provided.

Question 5

a) A company has introduced a process improvement that reduces processing time for each unit, so that output is increased by 25% with less material, but one additional worker required. Under the old process, five workers could produce 60 units per hour. Labor costs are RM 12/hour, and material input was previously RM 16/unit. For the new process, material is now RM 10/unit. Overhead is charged at 1.6 times direct labor cost. Finished units sell for RM 31 each. What increase in productivity is associated with the process improvement?

(4 marks)

b) The owner of Firewood Sdn. Bhd wants to expand their business. Use the following information in table 2, to calculate the company’s capacity planning.

Table 2: Firewood Sdn. Bhd Costs

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed costs</td>
<td>RM 15000</td>
</tr>
<tr>
<td>Variable Costs</td>
<td>RM 1.00 per unit</td>
</tr>
<tr>
<td>Revenue</td>
<td>RM 1.60 per unit</td>
</tr>
<tr>
<td>Design Capacity</td>
<td>45000 per unit</td>
</tr>
<tr>
<td>Effective Capacity</td>
<td>40000 units per year</td>
</tr>
<tr>
<td>Anticipated output</td>
<td>36000 units per year</td>
</tr>
</tbody>
</table>

i. What is the break-even quantity (produced and sold)?

(2 marks)

ii. What are total revenues for the break-even quantity?

(2 marks)
iii. What are total costs for the break-even quantity? (2 marks)

iv. What quantity would be required for a profit of RM 2,000? (2 marks)

v. What profit (loss) would there be for a quantity of 27,000? (2 marks)

vi. What profit (loss) would there be for a quantity of 10,000? (2 marks)

vii. What is the anticipated utilization? (2 marks)

viii. What is the anticipated efficiency? (2 marks)
Question 6

a) Lean operation is a highly coordinated system that uses minimal resources and produces high-quality goods and services. Describe briefly one of the methods that are common to lean operation.

(10 marks)

b) Develop a material requirements plan for end item P and its components, as given in the tree diagram 1 below. Assume that all lead times are one week, and that lot-for-lot ordering is used except for item F, which is ordered in multiples of 400 units. One hundred units of P are needed at the start of each of weeks 4 and 8. Beginning Inventories are: 20 P, 100 A, and 200 F. Scheduled receipts are: 800 F at the start of week 1.

Diagram 1: Tree diagram of item P

(10 marks)
Question 7

a) Given the projected demands for the next six months, prepare an aggregate plan that uses inventory, regular time and overtime, and backorders. Regular time is 150 units per month. Overtime is a maximum of 20 units per month. Overtime cost is RM 30 per unit, backorder cost is RM 20 per unit, inventory holding cost is RM 5 per unit, regular time cost of RM 20 per unit, and beginning inventory is zero.

<table>
<thead>
<tr>
<th>Month</th>
<th>Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>180</td>
</tr>
<tr>
<td>2</td>
<td>170</td>
</tr>
<tr>
<td>3</td>
<td>140</td>
</tr>
<tr>
<td>4</td>
<td>150</td>
</tr>
<tr>
<td>5</td>
<td>130</td>
</tr>
<tr>
<td>6</td>
<td>150</td>
</tr>
</tbody>
</table>

(15 marks)

b) Based on table 4, forecast for period 14, by using exponential smoothing with alpha = 0.2

<table>
<thead>
<tr>
<th>Period</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>81</td>
</tr>
<tr>
<td>12</td>
<td>75</td>
</tr>
<tr>
<td>13</td>
<td>82</td>
</tr>
</tbody>
</table>

(5 marks)

-END OF QUESTION-