



**UNIVERSITI KUALA LUMPUR  
Malaysia France Institute**

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**FINAL EXAMINATION  
JANUARY 2010 SESSION**

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**SUBJECT CODE** : FID 26102  
**SUBJECT TITLE** : INDUSTRIAL MANAGEMENT  
**LEVEL** : DIPLOMA  
**TIME / DURATION** : 8.00pm–10.00  
( 2 HOURS )  
**DATE** : 26 April 2010

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**INSTRUCTIONS TO CANDIDATES**

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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) questions only.
  6. Answer all questions in English.
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**THERE ARE 5 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.**

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**SECTION A (Total: 60 marks)****INSTRUCTION: Answer all questions.****Please use the answer booklet provided.****Question 1**

Define the terms below:

- a) Maintenance (2.5 marks)
- b) Maintenance management (2.5 marks)
- c) Quality (2.5 marks)
- d) Quality control (2.5 marks)

**Question 2**

There are three (3) phases of failure as been described as "Bathtub curve". Illustrate the three phases of failure and explain each of the phases.

(10 marks)

**Question 3**

Explain the differences of Preventive Maintenance and Predictive Maintenance. List two (2) advantages of each.

(10 marks)

**Question 4**

- a) Give the definition of reliability of a system or product. (6 marks)
- b) State four (4) elements in reliability definition. (4 marks)

**Question 5**

a) What are the objectives of Quality Control (QC)?

(6 marks)

b) List four (4) activities of QC.

(4 marks)

**Question 6**

The QC tool would enable us to explain the problem regarding the quality measurement and its solution. Illustrate and explain the following QC Tools:

a) Cause and Effect diagram

(5 marks)

b) Control Chart

(5 marks)

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

**INSTRUCTION: Answer two (2) questions only.**  
**Please use the answer booklet provided.**

**Question 7**

Use Pareto analysis to investigate the following data (Table 1) collected on a printed-circuit-board (PCB) assembly line.

- a) Prepare a graph of the data. Please show all calculations steps. (15 marks)
- b) Analyze the graph by giving your explanation. (5 marks)

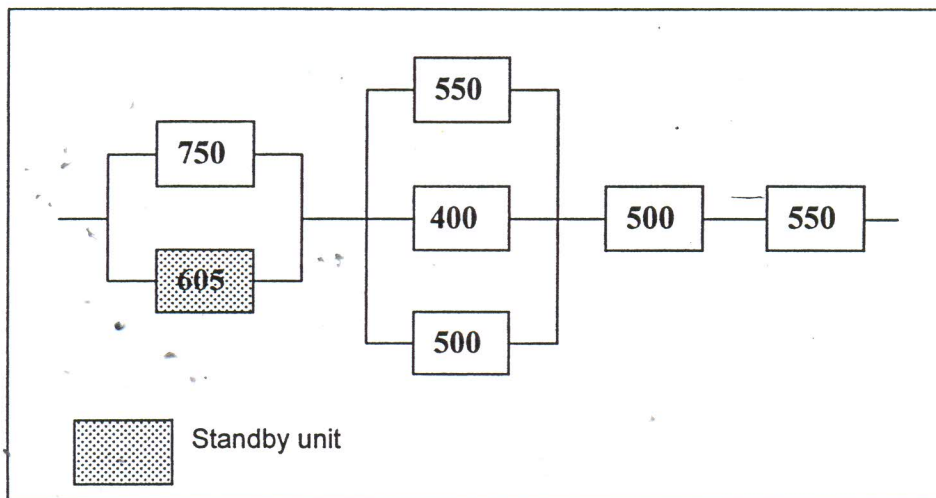
**Table 1: Defect detected on PCB assembly line**

Defect	Number of defect occurrences
Components not adhering	143
Excess adhesive	71
Misplace transistor	601
Defective board dimension	146
Mounting holes improperly positioned	12
Circuitry problems on final test	90
Wrong components	212

**Question 8**

The system in Figure 1 shows a Reliability Block Diagram (RBD) consisting of series, parallel and backup components. Each component has a mean time to failure (MTTF) as stated in the RBD. Determine the total system reliability for 24 hours operation. *(Please show all the calculation steps)*

(20 marks)



**Figure 1: Reliability block diagram**

## Question 9

Table 2 shows a breakdown data of Injection Molding machine of manufacturing company which produces plastics components. The company works 6 days per week with 16 hours operation per day.

May			June			July		
Week	Minutes / week	No. of breakdown	Week	Minutes / week	No. of breakdown	Week	Minutes / week	No. of breakdown
1	90	3	1	135	1	1	120	1
2	100	1	2	140	2	2	110	3
3	130	1	3	115	1	3	160	4
4	240	2	4	130	2	4	140	2

From the given data, calculate Injection Molding machine for:

- Mean Time Between Failure (MTBF) for the 3 months operation. (8 marks)
- Reliability. (Use  $t = 16$  hours) (5 marks)
- Availability. (3 marks)
- Give your comment on Injection Molding machine performance? (4 marks)

**END OF QUESTION**