SET A

UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION

JULY 2010 SESSION

SUBJECT CODE	:	FID 36302
SUBJECT TITLE	:	INDUSTRIAL MAINTENANCE MANAGEMENT
LEVEL	:	DIPLOMA
TIME / DURATION	:	12.30pm – 2.30pm (2 HOURS)
DATE	:	08 NOVEMBER 2010

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) questions only.

6. Answer all questions in English.

THERE ARE 4 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)

INSTRUCTION: Answer ALL questions.

Please use the answer booklet provided.

Question 1

Fault Tree Analysis (FTA) is one of maintenance tools/techniques. List another four (4).

(4 marks)

Question 2

Name two (2) types of maintenance organization.

(4 marks)

Question 3

Arrange in sequence the given activities below to describe the flow of improvement task.

"Verify result"　　　"Analyze"　　　"Investigate"　　　"Act"　　　"Standardization"

(4 marks)

Question 4

Give a reason, for the need to practice Total Productive Maintenance (TPM).

(5marks)

Question 5

What is the purpose of calculating the Overall Equipment Effectiveness (OEE)?

(5 marks)

Question 6

List six (6) big losses that will affect the equipment efficiency.

(6 marks)

Question 7

State in percentage (%) the ideal equipment efficiency of the following:

- Availability greater than ....%
- Performance greater than ....%
- Quality greater than ....%
- OEE ....%

(8 marks)

Question 8

Give three (3) benefits on keeping and use of maintenance record.

(9 marks)

Question 9

a) List five (5) types of maintenance record.

(5 marks)

b) Explain any two (2) types of maintenance record.

(10 marks)

SECTION B (Total: 40 marks)

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

Question 10

A machine operates for twelve hours per day with two shifts; with 15 minutes snap break mid shift and 10 minutes planned autonomous maintenance exercise at the beginning of the shift. During the operation time a total of 80 minutes was lost due to breakdowns, 20 minutes were lost to minor stoppage and a further 50 minutes for setup and adjustments. During the operation 680 items were produced, with an actual cycle time of 0.7 minutes, assuming the specification cycle time was 0.6 minutes and a total of 25 parts were reworked and 50 parts were rejected due to quality defect.

Calculate the following:

a) Availability rate

(8 marks)

b) Performance rate

(5 marks)

c) Quality Rate

(5 marks)

d) Overall Equipment Efficiency (OEE).

(2marks)

Question 11

Figure 1 shows the Fault Tree Analysis (FTA) of LCD display. What is the probability that the LC Display survives? Probability of survival for each failure event is given in Table 1.
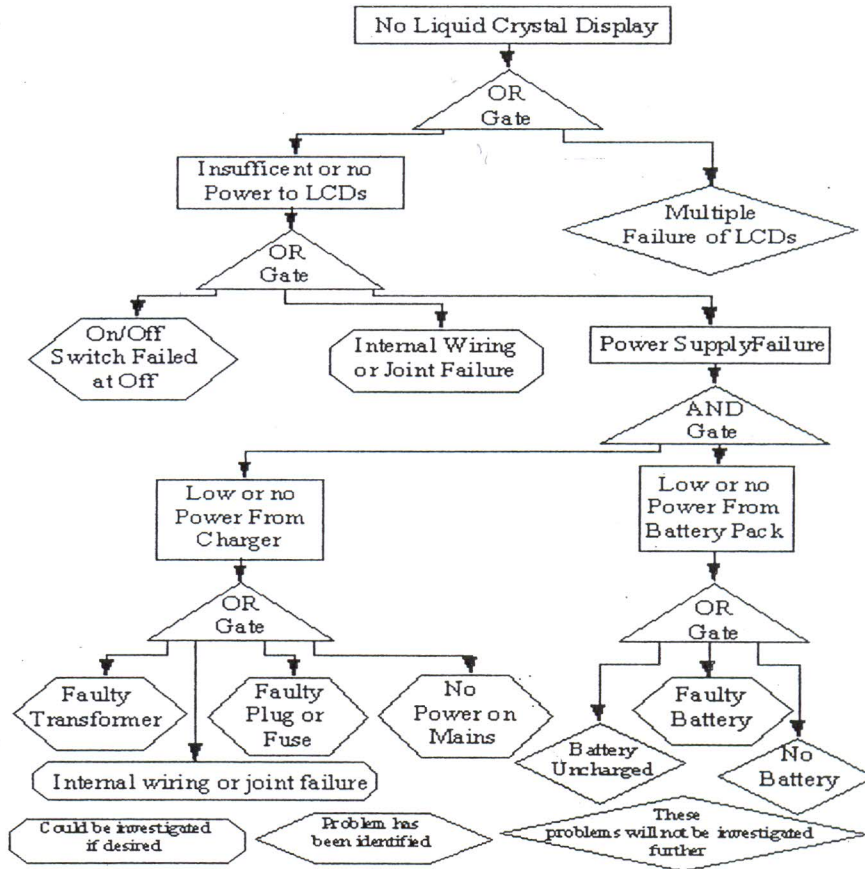
(20 marks)

Figure 1: Fault Tree Analysis for Liquid Crystal Display (LCD)

Table 1: Probability of survival (Reliability)

Event no.	Prime Event	Probability of Survival
1	Multiple failure of LCD's	0.999
2	On/off switch failed at off	0.995
3	Calculator internal wiring or joint failure	0.999
4	Transformer failure	0.995
5	Charger wiring or joint failure	0.999
6	Faulty plug or fuse	0.99
7	No power at mains	0 (ignored)
8	Battery uncharged	0.90
9	Faulty battery	0.99
10	No battery	0.95

Question 12

As Maintenance Engineer, you have to plan a maintenance action for machines given in Table 2. From the data taken with the help of Pareto Law, you must:

a) Create cumulative distribution and construct the Pareto diagram.

(10 marks)

b) Give a recommendation to perform maintenance planning.

(10 marks)

Table 2: Machine Breakdown data

Machine No. (i)	Hours downtime (C_i)	No. of Failure (F_i)
1	5	1
2	9	4
3	1	3
4	2	6
5	4	8
6	9	9
7	4	2
8	8	1
9	5	7
10	7	9
11	10	5
12	3	3
13	11	2
14	8	10
15	2	11

END OF QUESTIONS