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SET A

UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION

JANUARY 2014 SESSION

SUBJECT CODE	:	**FID 26102**
SUBJECT TITLE	:	**INDUSTRIAL MANAGEMENT**
LEVEL	:	**DIPLOMA**
TIME / DURATION	:	**2 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) questions only.**
6. **Answer all questions in English.**
7. **Graph paper is appended**

THERE ARE 5 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)

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

Question 1

Define the means of quality

(3 marks)

Question 2

State the five (5) elements of relation between quality and profit.

(5 marks)

Question 3

Define and explain the two (2) combinations of failure.

(6 marks)

Question 4

List the four (4) basic maintenance activities.

(6 marks)

Question 5

Differentiate the Predictive Maintenance and Preventive Maintenance related to its purpose and features.

(8 marks)

Question 6

Give four (4) elements in Reliability definition and explain any one (1) of the elements.

(10 marks)

Question 7

Explain briefly the failure costs stated below:-

a) Internal Failure Costs

(3 marks)

b) External Failure Costs

(3 marks)

c) Appraisal Cost

(3 marks)

d) Prevention Cost

(3 marks)

Question 8

Table 1 below are the elements of cost of quality. Arrange them into four (4) categories which are Internal Failure Cost, External Failure Cost, Appraisal Cost and Prevention Cost.

Table 1: Element cost of quality

Verification	Repair and Servicing	Scrap
Quality Planning	Warranty Claims	Complaints
Vendor Rating	Quality Assurance	Returns
Waste	Quality Audits	Rework
Liability	Inspection Equipment	Loss of Goodwill

(10 marks)

SECTION B (Total: 40 marks)

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

Question 9

The system in Figure 1 shows a Reliability Block Diagram consisting of series, parallel and backup components. Each component has reliability as shown in the diagram.

a. What will be the total system reliability?

(10 marks)

b. If Machine X must have a reliability of 0.98, calculate the Machine X :-

i. The required operation time (t)

(5 marks)

ii. The failure rate

(5 marks)

Note: Given mean life for machine X, 450 hours.

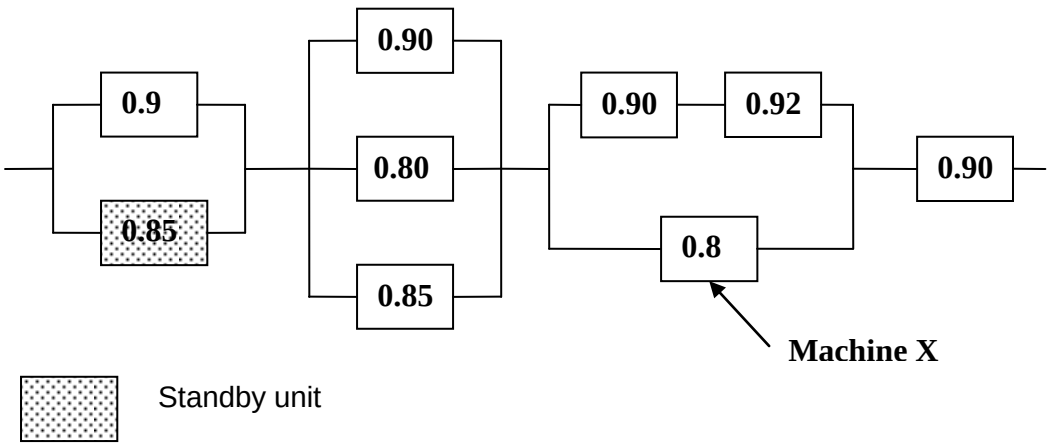

Figure 1: Reliability Block Diagram

Question 10

Figure 2 shows the Production Defect Check Sheet in a production line. Base on the defect data given:

a) Calculate the defect accumulative percentage.

(8 marks)

b) Construct the Pareto diagram.

(7 marks)

c) Interpret the diagram then states your explanation.

(5 marks)

(defect tracking sheet) No._____

PRODUCTION DEFECT CHECK SHEET

Product Line	3G Line	Date	12 / 09 / 02
Product Type	3G Alternators	Factory	Church Street
No. of Inspections	280	Data Collector	I. M. Quality
Total Number_____		Group Name	Day Shift
Lot Number_____		Remarks:_____	

TYPE	OCCURRENCE	SUBTOTAL
HIGH TURN ON SPEED	||||||||||||||||||	18
HIGH RIPPLE CURRENT	||||||||||||||||||||||||||||||||||||||||	38
HIGH LEAKAGE	||||||||||||	12
LOW OUTPUT AT LOW SPEED	||||||||||||||||	15
LOW OUTPUT AT HIGH SPEED	||||||||	7
DEAD UNIT	||||	4
BAD REGULATOR	||||||||||||||||||||||	22
BAD VOLTAGE SETPOINT	|||||||	6

Figure 2: Production Defect Sheet

Question 11

The Bangi Electric Company produces incandescent light bulbs. Table 2 shows the following data on the number of lumens for 40-watt light bulbs were collected when the process was in control.

Table 2: 40-watt light bulbs data

	OBSERVATION			
SAMPLE	1	2	3	4
1	604	612	588	600
2	597	601	607	603
3	581	570	585	592
4	620	605	595	588
5	590	614	608	604

a) Calculate $\overline{X}$ and R for each subgroup

(6 marks)

b) Plot the $\overline{X}$ chart

(7 marks)

c) Plot R chart

(7 marks)

Reference

Table for Constants of $\overline{X}$ and *R* chart:

Sample size *n*	$\overline{X}$ Chart A2	*R* Chart	
		D3	D4
3	1.023	0	2.574
4	0.729	0	2.282
5	0.577	0	2.114
6	0.483	0	2.004
7	0.419	0.076	1.924
8	0.373	0.136	1.864
9	0.337	0.184	1.816
10	0.308	0.223	1.777

END OF QUESTION