



**UNIVERSITI KUALA LUMPUR  
MALAYSIAN INSTITUTE OF INDUSTRIAL TECHNOLOGY**

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**FINAL EXAMINATION  
JANUARY 2016 SEMESTER**

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**COURSE CODE : JFB 40203**  
**COURSE TITLE : COMPUTERISED MAINTENANCE MANAGEMENT SYSTEM (CMMS)**  
**PROGRAMME LEVEL : BACHELOR**  
**DATE : 24 MAY 2016**  
**TIME : 2.30 PM – 5.30 PM**  
**DURATION : 3 HOURS**

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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. This question paper consists of ONE (1) section.**
  - 4. Answer FOUR (4) questions only.**
  - 5. Please write your answers on the answer booklet provided.**
  - 6. Please answer all questions in English only.**
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**THERE ARE 3 PAGES OF QUESTIONS EXCLUDING THIS PAGE.**

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**INSTRUCTION : Answer FOUR (4) questions.**

**Please use the answer booklet provided.**

**Question 1**

A Computerized Maintenance Management Software (CMMS) is easily the most important key to success for a maintenance systems manager. Once implemented, CMMS systems are quite useful to a vast spectrum of industries.

- (a) Clarify **FIVE (5)** importance factors of CMMS to manage the maintenance of a facility. (10 marks)
- (b) Discuss **FIVE (5)** benefits of Radio-Frequency Identification (RFID) technology with Computerized Maintenance Management System (CMMS). (15 marks)

**Question 2**

A well-planned and executed Computerized Maintenance Management System (CMMS) project can yield a maximum return of investment (ROI) realized through increased efficiency, productivity and profits. However, a poorly planned and executed CMMS project can result in a loss of revenues.

- (a) By using a simple diagram, define the step by step processes for the implementation of a Computerised Maintenance Management System (CMMS) project. (10 marks)
- (b) Discuss the factors of failure that resulting Computerized Maintenance Management System (CMMS) projects fail to reach its full potential. The factors must base on the:-
- (i) Employee Turnover
  - (ii) Employee Resistance
  - (iii) Management Support
  - (iv) Lack of Training
  - (v) Advance functionalities
- (15 marks)

**Question 3**

A problem frequently encountered in maintenance management is the optimal time for replacing a machine. An existing machine or equipment needs replacement for a variety of reasons such as deterioration, costs, obsolescence, excessive downtime and new requirement of the marketplace.

- (a) Define the terms of Capital Recovery Factor ( $A/P, i\%, n$ ) and Equivalent Uniform Annual Cost (EUAC) that being used in the Machine Replacement Analysis.

(5 marks)

- (b) Initial investment for a machine is \$15,000 and its expected market value, annual operation and maintenance expenses in each year are as given in Table 1. Interest rate is 5 percent per year. Analyse the economic life of the new machine.

Table 1: Machine Market Value and Maintenance Cost.

End of Year	Market Value (\$)	Annual Operation and Maintenance Expense (\$)
0	15,000	-
1	10,000	600
2	7,000	850
3	5,000	1,100
4	3,500	2,500
5	2,000	4,000

(20 marks)

**Question 4**

Total Productive Maintenance (TPM) is defined as a strategy that introduces elements of a good maintenance program to increase overall equipment effectiveness (OEE) and improve manufacturing processes.

- (a) Identify FIVE (5) key roles of implementing Total Productive Maintenance (TPM)

(10 marks)

- (b) Analyse the role of Computerised Maintenance Management System (CMMS) in supporting the key elements of TPM as stated in Question 4(a).

(15 marks)

### Question 5

Prior to implementing a Computerised Maintenance Management system (CMMS), it is advisable to consider other systems that the CMMS should or must be interfaced to or integrated with. The difference between interfacing and integration can be significant in the time it takes to develop the software and in the cost of development.

- (a) Besides inventory modules, identify **FIVE (5)** modules that most likely to be integrate with a CMMS and state the reasons for doing so.

(10 marks)

- (b) Integration of inventory system with CMMS is a mandatory if you are to receive full benefit from your CMMS. Explain **SEVEN (7)** key benefits of having inventory integrated with the CMMS.

(15 marks)

**END OF EXAMINATION PAPER**