



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF INDUSTRIAL TECHNOLOGY

DEPARTMENT OF INDUSTRIAL AND MANUFACTURING ENGINEERING

Bachelor of Engineering Honours Degree Industrial and Manufacturing Engineering

MAINTENANCE ENGINEERING

TIE 3110

First Semester Main Examination Paper

December 2014

This examination paper consists of 3 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements:

Examiner's Name: Eng. William M. Goriwondo

INSTRUCTIONS

1. Answer any five (5) Questions.
2. Each question carries 20 marks
3. Use of calculators is permissible

MARK ALLOCATION

QUESTION	MARKS
1.	20
2.	20
3.	20
4.	20
5.	20
6.	20
7.	20
TOTAL (Choose any 5 questions)	100

Question 1

- a) Explain how the maintenance function assists an organisation in the value creation system. [5]
- b) Discuss the nine (9) step approach for managing a maintenance program effectively. [15]

Question 2

- a) Under what circumstances is Corrective Maintenance suitable as a maintenance strategy? [4]
- b) Discuss the disadvantages of Corrective maintenance. [4]
- c) What are the benefits of implementing Reliability Centered Maintenance (RCM)? [8]
- d) Discuss the misconceptions about RCM and pitfalls in implementing RCM. [4]

Question 3

- a) Define Preventive Maintenance and state its disadvantages. [6]
- b) Choose any two Predictive Maintenance Technologies and explain how they can be utilised in an organisation. [14]

Question 4

- a) Differentiate Total Productive Maintenance (TPM) from Preventive Maintenance [5]
- b) Explain what transpires in each of the five Pillars of TPM. [15]

Question 5

You are the Maintenance Engineer in a manufacturing organisation. You have been tasked to put together an Asset Register that will be used for asset maintenance.

- a) Develop a typical numbering system that you would use in your Asset Register and explain the components of this numbering system. [8]
- b) Show using a diagram, a typical 3 level Asset Register structure that you would use for a specified machine. [8]
- c) What are the challenges with serial numbering in developing an Asset Register numbering system? [4]

Question 6

- a) Explain the role of computerisation in Maintenance Management. [5]
- b) If requested to recommend a Computerised Maintenance Management Systems (CMMS) vendor, which type of vendor would you recommend and why? [10]
- c) What benefits accrue in using CMMS at an organisation? [5]

Question 7

- a) Explain how the VED Analysis is used in Inventory Management. [8]
- b) Draw a matrix that explains all the components which combine the ABC and VED Analysis in Inventory Management. [12]