NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF INDUSTRIAL TECHNOLOGY

DEPARTMENT OF INDUSTRIAL & MANUFACTURING ENGINEERING

MASTER OF ENGINEERING IN MANUFACTURING SYSTEMS & ENGINEERING AND OPERATIONS MANAGEMENT

1st SEMESTER EXAMINATIONS DECEMBER 2011

QUALITY SYSTEMS **COURSE CODE - TIE 6230**

EXAMINATION DURATION 3 HOURS

INSTRUCTIONS TO CANDIDATES

Answer THREE questions in Section A and TWO in Section B

SECTION A : Answer 3 Questions in this Section.

QUESTION 1

a) Distinguish between “manufacturing” and “value” based definitions of quality. [4]
b) Discuss parameters by which “service quality” and “product quality” are measured. [4]
c) Outline the factors affecting product quality. [6]
d) How would you convince your company’s management on the benefits of Quality Cost measurement ? [6]

QUESTION 2

a) Discuss the organization of quality under a Total Quality Management System. [10]
b) Discuss elements addressed by ISO9000 2008 quality system. [10]

QUESTION 3

Discuss the purposes of marketing, research, production purchasing, services, stores, transport, quality assurance and finance in a manufacturing firm defining clearly their quality responsibilities. [20]

QUESTION 4

a) Identify the weakness of the quality views by quality gurus and explain why such views cannot be practised in Zimbabwe. [10]
b) Identify quality problem solving techniques, discuss their weaknesses [10]

SECTION B : Answer 2 Questions in this Section

QUESTION 5

(a) What are the advantages of measuring quality in terms of loss to the consumer? [4]
(b) “In sampling for statistical control, balancing the risk of occurrence between Type I and Type II errors is a major consideration in determining the sample size and the control limits”. Discuss this statement and explain how the notion affects delivery of quality? [10]

(c) Assume Acceptable Quality Levels (AQLs) are in widespread use in your company. One of your staff proposes a scheme whereby products failing the AQL test are distributed among those which pass readily. This would save sorting and still meet contractual requirements. Would you agree with this philosophy for :-

i. External customers [3]
ii. Internally, for the next manufacturing stage. [3]

QUESTION 6

(a) How does Taguchi define quality and how is his definition an improvement on other definitions? [5]
(b) Under what circumstances would it be permissible for a manufacturer to save on costs when the consequence would be a larger average loss on the part of consumers? [5]
(c) Define control variables and noise variables in design of experiments. [5]
(d) What is the purpose of Control Charts in attaining Quality Improvement? [5]

QUESTION 7

a) Show by use of equations, the relationship between the Manufacturer's Tolerance and the Consumer's Tolerance. [5]
b) Quality inside the tolerance range is not necessarily at the same level. Discuss this statement according to Taguchi's principles. [10]
c) Explain the behaviour of products using the LD50 point principle at the Upper and Lower Tolerance limits. [5]

END OF EXAM