NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF INDUSTRIAL TECHNOLOGY

DEPARTMENT OF INDUSTRIAL AND MANUFACTURING ENGINEERING

Masters in Engineering: Manufacturing Systems and Operations Management

1ST SEMESTER EXAMINATIONS – FEBRUARY 2010

QUALITY SYSTEMS - TIE 6230

Time Allowed 3 Hours

Instructions to Candidates

1. **Answer 3 Questions in Section A**
2. **Answer 2 Questions in Section B**
3. **Each question carries 25 marks**

SECTION A

QUESTION 1

Discuss the difference between Total Quality Management,QMS of ISO 9000 and Six Sigma. [20]

QUESTION 2

Compare and contrast the following quality Gurus.

a) Joe Juran
b) Bill Conway
c) Phil Crosby
d) Edward Deming

Whose views do you support ? [20]

QUESTION 3

Discuss in detail the following problem solving techniques and tools

a) Organisational techniques. [8]
b) System modelling techniques. [7]
c) Statistical tools. [5]

QUESTION 4

a) If quality becomes every Zimbabwean's ,Company business plan and everyone complains after receiving poor quality products and services then Zimbabwe will develop faster. Discuss [10]
b) Discuss and compare the following quality tools:
   i) Department Purpose Analysis.
   ii) Acceptable Quality Level.
   iii) Failure Mode and Effect Analysis. [10]

SECTION B

QUESTION 5

(a) Define Taguchi's Quality Loss Function. Use a typical product and its functionality to explain this concept. [10]
(b) Explain why the concept of "noise" is useful in product design and design of industrial experiments. [5]
(c) Comment on the statement: "Is quality improvement always worth pursuing?" [5]

QUESTION 6

(a) How do companies operating a monopoly suffer from competition with regards to quality? [4]
(b) Explain, referring to the Loss function, how a grading procedure on input components can be used to improve the quality of the final product. [6]
(c) If a product is subject to a routine maintenance schedule, comment on how this would affect the choice of components to use in that product to assure quality. [5]
(d) How would you relate quality based on the C_p index to quality based on the loss function? [5]

QUESTION 7

(a) Discuss Process Capability Ratio, and using figures, discuss what such figures (ratios) may mean in an organisation. [10]
(b) Compare piece to piece monitoring and control to traditional Statistical Process Control (SPC) Methods and outline their comparative effectiveness. [10]

END OF EXAMINATION