

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY



FACULTY OF INDUSTRIAL TECHNOLOGY

DEPARTMENT OF INDUSTRIAL AND MANUFACTURING ENGINEERING

Masters of Engineering in Manufacturing Engineering /Systems and Operations Management

Supplementary Examination

COURSE : QUALITY SYSTEMS
CODE : TIE 6230
DATE : JULY 2013
DURATION : 3 HOURS

INSTRUCTIONS AND INFORMATION TO CANDIDATE

1. Answer **two questions** from Section A and **two questions** from section B.
 2. This paper contains six **(6)** questions (Three in each section)
 3. There are 3 **(3)** printed pages.
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REQUIREMENTS

SECTION A

QUESTION 1

- a). Discuss in detail the following problem solving techniques and tools
- i) Organizational techniques [5]
 - ii) System modeling techniques [5]
 - iii) Statistical tools. [5]
- b) The tastes of customers towards a product are dynamic, they change with time and exposure pursuing quality issues is like chasing a shadow, you will never catch up with it. Using material drawn from lectures discuss this statement and if it reflects the view of your top management. [10]

QUESTION 2

Discuss the merits and demerits of applying the four quality organizing techniques, which are quality control, quality assurance, total quality management (TQM) and six sigma Which one would be the best for your organization? [20]

QUESTION 3

- a). Discuss the common points and divergent points of the American quality gurus that have been covered in your quality course. How will these points affect the performance of your company? [15]
- b). Comment on the factors which affect product quality. [10]

SECTION B

QUESTION 4

- (a) Distinguish between Quality and Variety of products using examples [3]
- (b) What are the advantages of measuring quality in terms of loss to the consumer? [6]
- (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 [4]
 - ii. Internally, for the next manufacturing stage. [4]
- (e) Discuss the advantages and disadvantages of the AQL. [8]

QUESTION 5

- (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]
- (c) Explain the circumstances in which piece-to-piece control is counter productive. [5]

QUESTION 6

- (a) What is the purpose of Control Charts in attaining Quality Improvement? [5]
- (b) Explain Tolerance based control charting and Performance based control charting. [10]
- (c) What should be done when processes go out of control on either side of the control limits? [5]
- (d) Explain the link between the Central Limit Theorem and the Six Sigma Principle. [5]

END OF EXAMINATION