



University of Cape Coast
College of Humanities and Legal Studies
School of Business
Department of Marketing & Supply
Chain Management

END-OF-FIRST SEMESTER EXAMINATIONS, 2019/2020 ACADEMIC YEAR
SBU 301: OPERATIONS MANAGEMENT

Miss Grant for SRC General Secretary hopeful '21

Time allowed: TWO (2) HOURS

Student ID																			
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INSTRUCTION:

Answer QUESTION ONE and any other TWO (2) QUESTIONS. EACH QUESTION CARRIES 20 MARKS

Examiners: Mr. Kwamena N. Mintah

Dr. Dominic Owusu

Mr. Kassimu Issau

Mr. Paul Agyei Mensah

Miss Grant

QUESTION 1

Mini Case (Compulsory) 20 Marks

Geneva Construction and Risk (GCR)

Geneva Construction and Risk (GCR) is an insurance company that specializes in providing insurance for construction projects, especially complex, high risk projects, where contractual and other legal issues, physical exposure and design uncertainty need 'customized' insurance responses. It is part of the larger Wichita Mutual Insurance Group. It is the company's intention to adopt a Six Sigma improvement methodology.

Unfortunately, the company's experience with 'quality initiatives' is not good. Some years ago Wichita Mutual had instructed all companies in its group to adopt a total quality management (TQM) initiative. It had done this in a very prescriptive way by issuing a handbook with detailed instructions of how TQM was to be implemented throughout the group. Although the TQM initiative had never been formally pronounced a failure, it had faded over the years without having the overall impact that once was hoped of it. This time, Tyko Mattson, the Six Sigma champion, a newly hired person at GCR, is convinced that an improvement initiative based on Six Sigma principles will be more of a success. The company describes the previous TQM initiative to Tyko Mattson and why it is hoped that the Six Sigma initiative will prove more effective. The description covered the following:

The handbook said that ^{everyone} everyone must be involved. The handbook said that all companies in the group must organize the TQM initiative in the same way 'according to the handbook'. Emphasis was put on measuring the cost of quality. Similar improvement techniques were used throughout the group. Everyone was assigned as part of a quality circle. Annual award ceremonies were conducted where 'certificates of merit' were awarded. The initiative was run by a company-wide quality committee. The quality committee organized groups and quality training. It also evaluated whether the suggestions for improvements should be implemented and allocated budget to their implementation. Eventually the evaluation procedures were taking up so much time and effort that the company moved towards a limited form of self-certification involving small improvement budgets on a group-by-group basis. Improvement budgets and improvement plans are still used in the company. The annual awards ceremony is now a 'general communications' meeting.

Upon examining TQM quality initiative, Tyko Mattson describes his views of some of the advantages and disadvantages of Six Sigma as an improvement approach and makes recommendations as to how it can be applied at GCR. He indicated that Six Sigma is a process-centred approach that includes process design, performance measurement, continuous improvement (using the DMAIC cycle), statistical process control, quantitative and evidence-based decision making, an emphasis on the negative effects of process variation and the 'normalization' of processes using the 'defects per million opportunities' (DPMO) principle. He further indicated that Six Sigma approach is a rigorous approach that incorporate the other initiatives and can help tackle operational risk.

Since GCR is already an insurance firm it can employ its insurance

Miss Grant

Source: Adapted from Slack, Chambers and Johnston, 2010, Operations Management, Sixth Edition, Instructor's Manual

Required: Use the case to answer the following questions;

1. How does the Six Sigma approach seem to differ from the TQM approach adopted by the GCR several years ago? (8 Marks)
2. Is Six Sigma a better approach for this type of company? *Advantages* (6 Marks)
3. Do you think that Tyko can avoid the Six Sigma initiative suffering the same fate as the TQM initiative? (6 marks)

QUESTION 2

- a. With operation-oriented example in each case, explain any **five (5)** short term capacity strategies that are employed by operations managers in their quest to achieve operational objectives. (10 Marks)
- b. Explain the following production systems in operations management context, given cognizance to their strengths and weaknesses. (2.5 Marks each)
 - i. Mass production system
 - ii. Batch production system
 - iii. Job-shop production system
 - iv. Continuous production system

QUESTION 3

- a. Differentiate between design capacity and system capacity (4 Marks)
- b. Explain **four (4)** strategies that can be employed to improve product reliability. (12 Marks)
- c. Advance **four (4)** reasons why firms keep stock. (4 marks)

QUESTION 4

- a. Forecasts enhance planning process of organizations. It enables managers to anticipate future to budget and plan for: capacity, production, sales and personnel requirements. Explain the basic processes firms engage in during forecasting. (12 Marks)
- b. Using practical examples, explain the differences among: (2 Marks each)
 - i. Product layout
 - ii. Process layout
 - iii. Fixed position layout
 - iv. Group layout

Design the problem
measure -
Analysis -
improvement -
Control -

QUESTION 5

- a. Many factors have to be analyzed in connection with development and design of a product, factors varying in character and complexity, factors affiliated with different fields in production and industrial engineering. Examine **five (5)** of such factors. **(10 Marks)**
- b. Explain **five (5)** benefits a firm may derive from employing Just-In-Time (JIT) production methodology. **(10 Marks)**