THE OPEN UNIVERSITY OF SRI LANKA
DEPARTMENT OF TEXTILE AND APPAREL TECHNOLOGY
POST GRADUATE DIPLOMA IN TECHNOLOGY
(APPAREL PRODUCTION AND MANAGEMENT)
FINAL EXAMINATION – 2016/2017
TTM7138- QUALITY MANAGEMENT
DURATION: THREE HOURS

Date: 26th November 2017 **Time:0930-1230 Hours**

Total number of questions = 07

Answer only 5 questions.

Marks for each question are indicated at the end of the question.

Q1. (a) Quality management has four main components. With referring these components, briefly explain how quality management can be implemented in a production organaisation. (20 marks)

(b) With referring the objectives of Total Quality Management(TQM), briefly explain why TQM is very important to be applied today in manufacturing industries. (20 marks)

(c) Following given are Deming's two points. Briefly explain what can you gain by these two , their importance and how you can apply them to your production organaisation.

(i) "Create and publish to every employee, statement of the aims and purposes (Mission Statement) of the company. The management must demonstrate constantly their commitment to this statement"

(ii) "Improve constantly and forever the system of production and service"

(60 marks)

Q2. (a) Dr. Juran focused on quality of a product as "Fit for use" it, with referring the concept "Quality trilogy". Briefly explain this concept and describe how fit for use of a product can be achieved using any one (01) component in the quality trilogy (30 marks)

(b) (i) How do you determine the Quality of a service? You may refer two factors with providing examples. (20 marks)

(ii) Quality of a service can be summerised into several factors . briefly explain any two (02) of them with providing practical examples. (20 marks)

(c) (i) Differentiate two terms "Quality" and "Productivity" (10 marks)

(ii) Briefly describe the "Quality Circle" concept" and describe its importance to the industry by referring its gains to the production organaisation. (20 marks)

Q3. (a) (i) Briefly explain how you use the check sheets, scatter diagrams pareto analysis and cause effect diagrams together to solve quality related issues in the production industry. (20 marks)

(ii) Briefly explain the purpose of using control charts as a quality control tool and give any formulas, that you can use to develop the main two types of control charts. (20 marks)

(b) Why quality functional deployment (QFD) is important in product designing and Manufacturing? You may use the house of quality (HOQ) structure. (20 marks)

(c) Briefly describe how you can manufacture a product for customer requirements using the four phases of QFD matrices. (40 marks)

Q4. (a) (i) Draw suitable diagrams and differentiate the capable process and incapable process. (20 marks)

(ii) How do you use the variations of Cp index to decide the stable or unstable situation of a production process? You may draw the process variation charts for each variation of Cp to support your answer. (20 marks)

(b) Differentiate single sampling and double sampling techniques used in quality control. (20 marks)

(c) (i) Draw a sample operating characteristic curve (OC) and explain how do you obtain

acceptable quality level (AQL) and lot tolerance percentage defective (LTPD) of a production. (20 marks)

(ii) Explain the difference between producer's risk and consumer risk using the OC curve you have already drawn. (20 marks)

Q5. (a) (i) Briefly explain why ISO 9000 standard is considered as a family of standards and the main areas covered by each of the member in the family. (20 marks)

(ii) List out eight quality management principles and briefly explain the importance of any two (02) of them. You may consider the key benefits of each of them. (20 marks)

(b) Draw a suitable diagram and explain the variations of four types of quality costs with giving the reasons. (40 marks)

(c) Differentiate the followings with providing suitable examples for each case.

(i) Manufacturing costs and non-manufacturing costs

(ii) Product cost and period cost (20 marks)

Q6. (a) Technical officer has noted the following data for the failure of 1000 electronic circuit components. Test was done for 5 days.

Day	Number of failures
01	03
02	09
03	10
04	15
05	28

Calculate the ,

(i) Average failure density for the considered time period

(ii) Mean failure rate (MFR)

(iii)Average reliability for the considered time period

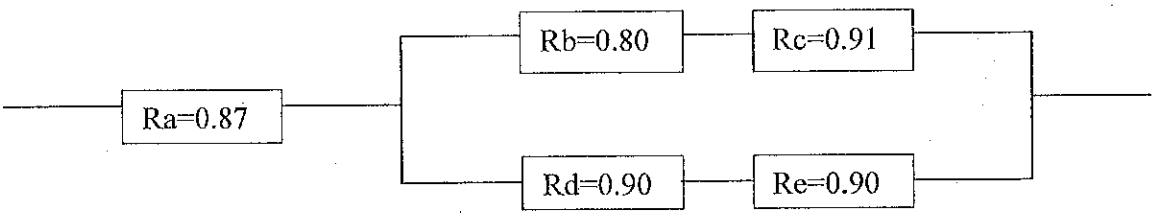
(30 marks)

(b) LED bulb manufacturing company collected the following data from the testing of 1000 bulbs for 3000hrs. The time interval is 500hrs. Calculate the Mean Time to Failures up to 8000hrs.

Time interval hours	No. of failures
T<500	10
500<T<1000	05
1000<T<1500	20
1500<T<2000	18
2000<T<2500	17
2500<T<3000	10

Determine the Mean Time to Failures (MTTF) at the 3000hour. (30 marks)

(c) Calculate the system reliability of the following electric circuit.



(40 marks)

Q7. (a) Briefly explain why bench marking used in production industry and explain any three (03) advantages of doing bench marking. (30 marks)

(b)(i) Briefly explain the Six sigma concept and its any three (03) advantages. (20 marks)

(ii) Briefly explain two methodologies of applying Six sigma to the industry. (20 marks)

(c) (i) Briefly explain Just in Time (JIT) philosophy and its importance of using in a production industry. (20 marks)

(ii) Why pull system is recommended to today in manufacturing industry over push system? (10 marks)