Examination Period 3: 2016/17

MODULE Title
Lean Manufacturing and Quality Applications
Level
Six
Time Allowed
Two hours

Instructions to students:

- Enter your student number not your name on all answer books.
- Answer four out of six questions.
- All questions are equally weighted.
- Begin each question in a separate answer book; label each answer book clearly with the number of the question you are answering.
- Neither books nor notes may be taken into the examination.

No. of Pages 5
No. of Questions 6
Answer four out of six questions.

Question 1

a. You need to describe fully an automated production process. Choose one from the following:
   - Automotive
   - Aerospace
   - Food Industry
   - Public Services

   You must consider essential factors such as process layout, inventory and visual management. Explain briefly why your chosen sector has decided to follow the continuous improvement path, and state clearly the benefits/disadvantages

   (15 marks)

b. Draw a simple process map for a process (e.g. making a cup of tea). Identify areas for improvement from the aspect of waste.

   Your process map should be a visual system that identifies the wastes within the process, each step should be broken down to an amount of time. Produce a future state map that would show improvements, such as reduction in walking. You should also identify value added and non-value added.

   (10 marks)

   Total: 25 marks
Question 2

a. Consider a Kaizen system within the Automotive Sector, Aerospace or Food Industry. Prepare a small report to management explaining the meaning of Kaizen. Include in your answer explanations of what Kaizen means, where the technique was initially devised and then developed, and by whom.

Following on from your report explain your strategy for implementing the kaizen system and identify what other Quality Tools could help in making improvements to Quality.

(15 marks)

b. Give a full and detailed explanation of value and non-value added in relation to a product or service. State a minimum of two examples of consumer related products that have experienced problems in 2016/17 and how the company addressed the concerns of the consumer.

(10 marks)

Total: 25 marks

Question 3

a. Explain what Poke Yoke is and its importance.

(5 marks)

b. Sketch a design for a simple Poke Yoke system that could be implemented into a Manufacturing Environment.

(5 marks)

c. There are seven DTI KPI measures that can be used to take specific measurements to achieve World Class Manufacturing, list them all and give a brief description of them.

(10 marks)

d. Explain the importance of displaying Data, list some visual ways Data can be displayed, this can be local data or at company specific levels.

(5 marks)

Total: 25 marks
Question 4

5 C/S.

a. Present a logical argument for its use by identifying the five areas that this technique concentrates on. Identify in the correct sequence all five steps. Give a visual sketch example showing before and after 5s/c.

(15 marks)

b. Use examples to demonstrate how 5S methodology would operate and could be used to reduce mistakes and improve quality. List some 5s/c simple, effective systems you would expect to see within a manufacturing SME.

(10 marks)

Total: 25 marks

Question 5

Visual Management needs no interpretation in the workplace, an environment where things are obvious from the minute you walk into an area.

You have been asked to introduce a Visual management system for a process.

a. Suggest and identify a minimum of eight Visual management systems that would improve QCD. Refer to examples seen during both flipped learning and lectures.

(15 marks)

b. Consider the importance of Visual management, choose one good example from the ones identified in a. and fully explain it. Consider reasons why it’s good or not good, suggest a possible alternative method of visually showing the same.

Eg; Digital car dash displaying mph, compared to a clock version where the needle/pointer moves to align with a number or value.

(10 marks)

Total: 25 marks
Question 6

Toyota has **three** Japanese words that describe conditions for improvement known as the 3Ms Muri, Mura and Muda. They are key concepts in the Toyota Production System of Lean Manufacturing.

You have been asked to introduce and co-ordinate a sustainable MUDA initiative within your Organisation.

**a.** Identify the types of waste that MUDA would address and appraise the characteristic causes associated with each of the problems.  

(15 marks)

**b.** Suggest other Quality Tools that can enhance the implementation of MUDA within your organisation.  

(10 marks)

**Total: 25 marks**

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End of Paper