



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF APPLIED CHEMISTRY
BACHELOR OF SCIENCE HONOURS DEGREE
END OF SECOND SEMESTER EXAMINATIONS – MAY 2013
QUALITY ASSURANCE MANAGEMENT AND CONTROL – SCH 2211
TIME: 3 HOURS

Instructions to candidates

Answer **All** Questions from Section A and **any three (3)** from Section B. Section A carries forty (40) marks and each question in Section B carries twenty (20) marks.

Start your answers to each question on a new page. This paper comprises 5 printed pages.

SECTION A [Answer All Questions from this Section. This Section carries forty (40) marks].

Study the attached case and answer all the questions that follow.

1. (a) What is the real change maker in McDonald's operations? Why do you think they will continue to lead the pack in the fast food industry? (10 marks)
- b) Identify what challenges McDonald's is likely to face in the coming decades. Suggest preemptive measures that the organisation should undertake to minimize the negative effects of these challenges. (6 marks)
- c) What do you think is McDonald's quality system and how do you think it operates? (6 marks)
- d) Which characteristics of McDonald's production system have been most important in building its record of success and growth in the industry? (6 marks)
- e) Suggest an organizational structure for McDonald's. Why is the organizational structure important in TQM implementation? (8 marks)
- f) Why is it important for McDonald's to invest in the training of its franchises? (4 marks)

SECTION B [Answer any three (3) questions from this Section. Each question carries twenty (20) marks.]

2. a) Explain the importance of *poka-yoke* in TQM. (4 marks)

b) Mistake-proof this:

A local countertop company makes and then loads the countertop pieces on to a truck and goes to the customer's home and installs the countertop.

More than 15% of all installation jobs have to be done with more than one trip to the customer's home because one or more pieces of the countertop was not loaded on the truck.

(6 marks)

b) **The intensive care unit lab process has an average turnaround time of 26.2 minutes and a standard deviation of 1.35 minutes.**

The nominal value for this service is 25 minutes with an upper specification limit of 30 minutes and a lower specification limit of 20 minutes.

The administrator of the lab wants to have three-sigma performance for her lab. *Is the lab process capable of this level of performance?*

(6 marks)

c) Write down the NUST mission statement and comment on its validity for an innovative institution. (4 marks)

3 a)

Sample	n	Defectives	p
1	100	4	0.04
2	100	2	0.02
3	100	5	0.05
4	100	3	0.03
5	100	6	0.06
6	100	4	0.04
7	100	3	0.03
8	100	7	0.07
9	100	1	0.01
10	100	2	0.02
11	100	3	0.03
12	100	2	0.02
13	100	2	0.02
14	100	8	0.08
15	100	3	0.03

Construct the p-chart and comment on the status of the process shown by the above table
(8 marks)

b) Explain the two types of errors that can occur with control charts. How best can you tackle these errors?
(4 marks)

c) Explain the term 'Quality policy'. Give five elements of a good quality policy of an organisation.
(8 marks)

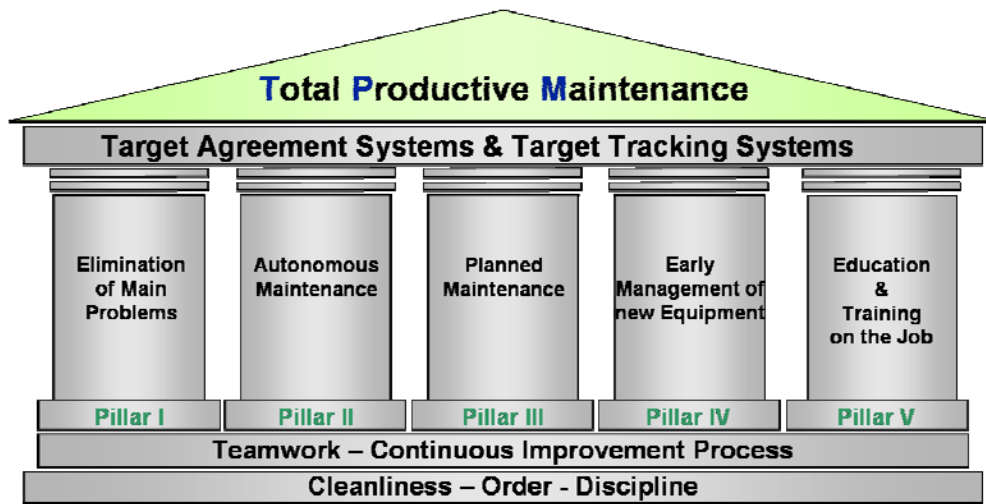
4 a) Define what employee empowerment is.
(3 marks)

b) What are the three conditions necessary to create the empowered environment for employees
(6 marks)

c) Explain how Hwange Colliery Company can implement the TQMEX Model. Use information gathered or observed during your educational visit to the company in March, 2013.
(11 marks)

5. The diagram below shows 5 pillars of TPM. Explain how each pillar supports the whole structure in a manufacturing organisation.
(20 marks)

The 5 Pillars of TPM-Concept



THE CASE



CASE STUDY Mc Donald's

INTRODUCTION

- McDonald's, the leader in the fast-food wars, faced a crossroads in the early 1990s.
- Domestically, sales and revenues were flattening as competitors like Burger King, Wendy's, and Taco Bell encountered new challenges
- Sonic and Rally's competed using a back-to-basics approach of quickly serving up burgers, just burgers, for timeless consumers.
- McDonald's was gathering flak from environmentalists who decried all the litter and solid waste its restaurants generated each day
- To counter some of the criticism, McDonald's partnered with the Environmental Defense Fund (EDF) to explore new ways to make its operations more friendly to the environment.
- Together, EDF and McDonald's considered its impact on a wide range of stakeholders—customers, suppliers, franchisees, and the environment. The company gave its franchisees much autonomy in finding ways to eliminate environmental blight

FACTS

- McDonald's roots go back to the early 1940s when two brothers opened a burger restaurant that relied on standardized preparation to maintain quality the Speed Service System.
- So impressed was Ray Kroc with the brothers' approach that he became their national franchise agent, relying on the company's proven operating system to maintain quality and consistency.
- Over the next few decades, McDonald's used controlled experimentation to maintain the McDonald's experience, all the while expanding the menu to appeal to a broader range of consumers. For example, in June 1976, McDonald's introduced a breakfast menu as a way to more fully utilize the physical plant. In 1980, the company rolled out Chicken McNuggets.

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FACTS

- Introduction of brown paper bags with a considerable percentage of recycled content.
- Solicitation of suppliers to produce corrugated boxes with more recycled content, which had the twin effect of reducing solid waste and building a market for recycled products.
- Abandonment of polystyrene clamshell containers to hold sandwiches in favor of new paper-based wraps that combined tissue, polyethylene, and paper to keep food warm and prevent leakage.

MCDONALD'S SUSTAINED PROSPERITY

- The secret of McDonald's success is its willingness to innovate, even while striving to achieve consistency in the operation of its many outlets. For example, its breakfast menu, salads, Chicken McNuggets, and the McLean Deluxe sandwich were all examples of how the company tried to appeal to a wider range of consumers.
- The company has also made convenience its watchword, not only through how fast it serves customers, but also in the location of its outlets. Freestanding restaurants are positioned so that you are never more than a few minutes away by foot in the city or by car in the suburbs. Plus McDonald's is tucking restaurants into schools, stores, and more.

KEY THREATS

- The key threats to McDonald's domestically are the lack of growth opportunities. The market is well saturated, and it would be difficult to achieve double-digit growth. Other concerns are a newfound emphasis on healthier eating. Most of McDonald's most popular fare probably in some small way contributes to the increasing incidence of cancer, heart disease, and diabetes among the population.
- McDonald's are everywhere, the dining experience is never special. And as Baby Boomers age and become more affluent, it is likely that they will leave behind their fast-food ways, if only to step up to moderately priced restaurants like Olive Garden, Bennigans, and Pizzeria Uno. These chains have the added advantage of serving higher-margin alcoholic drinks. McDonald's, meanwhile, has to continually battle Burger King and Wendy's, which leads to an erosion of margins for everyone. Even alliances with toy manufacturers, while popular with consumers, do little for the bottom line because the cost to run these promotions can be quite expensive.

MCDONALD'S AND THE ENVIRONMENTAL DEFENSE FUND

- In some ways, partnering with the Environmental Defense Fund was a masterstroke. It brought both respectability and valued expertise to its environmental efforts. It also provided a primetime venue for EDF to make a difference. Any successes, even if only incremental improvements, would have major ramifications because of the sheer size of McDonald's operations.
- McDonald's should continue its partnership with EDF. With ecology a growing concern among consumers, it makes sense to be a good corporate citizen and get all the public relations accolades that go along with such an alliance. It also pays off in the bottom line by reducing shipping costs for supplies as well as garbage removal fees.
- McDonald's would do well to stay in the vanguard of corporations who have become environmentally aware. If it tries to shirk its responsibilities, it can foresee a public relations nightmare in the making. But if it does manage to come up with some breakthroughs through its collaboration with EDF, it can score a tremendous amount of goodwill with the public, which may even provide a halo effect to mitigate any other PR troubles.

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- How far should McDonald's go on environmental issues? There is definitely a public relations benefit in being seen as an environmental leader, and the collaboration with EDF goes a long way in making that happen. Still McDonald's has had a lot of success in giving its franchisees some latitude in developing new solutions.
- The line in the sand in determining how far McDonald's should go with its environmental efforts is determined by the cost of the initiative relative to the hard-dollar benefits and harder-to-quantify public relations buzz it gets from being in the forefront on environmental issues

CONCLUSION

- McDonald's faces some difficult challenges. Key to its future success will be maintaining its core strengths—an unwavering focus on quality and consistency—while carefully experimenting with new options. These innovative initiatives could include launching higher-end restaurants under new brands that wouldn't be saddled with McDonald's fast-food image. The company could also look into expanding more aggressively abroad where the prospects for significant growth are greater.
- The company's environment efforts, while important, should not overshadow its marketing initiatives, which are what the company is all about.

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