BERJAYA
UNIVERSITY COLLEGE

FACULTY OF BUSINESS

FINAL EXAMINATION

Student ID (in Figures)   :

Student ID (in Words)   :

Course Code & Name   :   **LSC2503 Six Sigma**
Semester & Year   :   September – December 2022
Lecturer/Examiner   :   Wan Ahmad Asrar Nik @ Wan Yahya
Duration   :   3 Hours

INSTRUCTIONS TO CANDIDATES

1. **This question paper consists of 2 parts:**
   PART A (60 marks)   :   **FOUR (4) short answer questions. Answers are to be written in the Answer Booklet provided.**
   PART B (40 marks)   :   **TWO (2) essay questions. Answers are to be written in the Answer Booklet provided.**
2. **Candidates are not allowed to bring any unauthorized materials except writing equipment into the Examination Hall. Electronic dictionaries are strictly prohibited.**
3. **This question paper must be submitted along with all used and/or unused rough papers and/or graph paper (if any). Candidates are NOT allowed to take any examination materials out of the examination hall.**
4. **Only ballpoint pens are allowed to be used in answering the questions, with the exception of multiple-choice questions, where 2B pencils are to be used.**

WARNING: The University Examination Board (UEB) of BERJAYA University College regards cheating as a most serious offence and will not hesitate to mete out the appropriate punitive actions according to the severity of the offence committed, and in accordance with the clauses stipulated in the Students' Handbook, up to and including expulsion from BERJAYA University College.

Total Number of pages = 4 (Including the cover page)

PART A : SHORT ANSWER QUESTIONS (60 MARKS)

INSTRUCTION (S) : Answer all **FOUR (4)** short answer questions.
Write your answers in the Answer Booklet (s) provided.

Question 1

a. Define Six Sigma. (1 mark)

b. Describe the **FOUR (4)** key metrics on which Six Sigma is focused. (8 marks)

c. State **THREE (3)** key principles on which Total Quality Management (TQM) is based. (3 marks)

d. Provide **THREE (3)** relevant examples of internal customers. (3 marks)

[Total: 15 marks]

Question 2

a. Define process. (1 mark)

b. Explain the term "non-conformance". (5 marks)

c. Describe **FOUR (4**) common causes of problem. (8 marks)

d. Provide **ONE (1**) relevant example of critical to quality. (1 mark)

[Total: 15 marks]

Question 3

a. Explain how the "Define" stage of the DMAIC process is structured. (5 marks)

b. Describe any **THREE (3)** tools of the seven management and planning tools used to assist in planning and managing Six Sigma projects. (6 marks)

c. Process capability indexes, Cp, Cpl, and Cpu, may be used to establish or improve quality policies in operating areas or with supplier.

    i. Define Cp, Cpl and Cpu (3 marks)

    ii. Briefly explain how they are used. (1 mark)

[Total: 15 marks]

Question 4

a. Define statistical process control. (1 mark)

b. Briefly explain **FIVE (5)** characteristics of Japanese Kaizen. (5 marks)

c. Describe the **THREE (3)** components of any control system. (6 marks)

d. State **THREE (3)** benefits of quality function deployment. (3 marks)

[Total: 15 marks]

END OF PART A

PART B : **ESSAY QUESTIONS (40 MARKS)**
INSTRUCTION (S) : Answer all **TWO (2)** essay questions.
Write your answers in the Answer Booklet (s) provided.
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Question 1

a) Assume that A & B Express expects the standard delivery time is within 3 days to 5 days. The branch manager wants to know how many percent of the deliveries were operating at Three Sigma. Therefore, he picked up randomly 20 delivery data of the previous week. The data are 3, 4, 3, 5,5, 4, 3, 6, 6, 2, 3, 4, 4, 5, 3, 3, 5, 6, 3 and 4 days respectively.

i. Calculate the mean, standard deviation and show the normal curve with labels. (5 marks)

ii. Calculate the percentage of all deliveries that were operating at Three Sigma. (2 marks)

b) The branch manager wants to start analyzing the company's quality. For each delivery, there are four types of customer complaints: (a) broken goods, (b) broken packages, (c) late delivery, and (d) wrong parcels. During the past week, his company delivered 280 parcels. He received 26 total complaints.

i. Calculate his company's defect per million opportunities (DPMO) for the past week. (2 marks)

ii. Determine his company's Six Sigma operating level. (1 mark)

c) Design of Six Sigma (DFSS) uses DMADV methodology to predict and avoid errors and defects in product development. Discuss DMADV process by providing **FIVE (5)** relevant examples.
(10 marks)

[Total: 20 marks]

Question 2

a) Assume that your restaurant has been facing long wait problem since 2020. Illustrate the causes and sub-causes by using a fish bone diagram to solve the problem.
(10 marks)

b) Waste exists in demand forecasting, procurement, inventory management and product manufacturing. Discuss **FIVE (5)** ways Lean Six Sigma can eliminate the seven wastes.
(10 marks)

[Total: 20 marks]

END OF EXAM PAPER