GALGOTIAS UNIVERSITY

ADMISSION NUMBER												

School of Business

Bachelor of Business Administration
Semester End Examination - May 2024

Duration : 180 Minutes
Max Marks : 100

Sem VI - D1UA612T - Lean Manufacturing and Six Sigma

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1)	Describe a scenario where you could apply the 5S methodology to improve workplace organization and efficiency.	K3	(6)
2)	You're a production manager at a manufacturing plant tasked with improving the quality of a particular product line. The company has identified a high defect rate in the final product, resulting in increased rework and customer complaints. As part of your initiative to implement Six Sigma principles, you've been asked to lead a project to reduce defects and enhance overall product quality. Describe how you would apply the DMAIC (Define, Measure, Analyse, Improve, Control) methodology of Six Sigma to address the high defect rate in the manufacturing process.	K3	(9)
3)	How would you apply value stream analysis to identify and prioritize areas for improvement within a business process?	K4	(4)
4)	Discuss the steps you would take to apply motion waste reduction techniques to streamline work processes and improve worker productivity.	K4	(8)
5)	Three bagging machines at the Crunchy Potato Chip Company are being evaluated for their capability. The following data are recorded: Bagging machine are A, B and C. The standard deviation for A, B and C is 0.2, 0.3 and 0.05 respectively.If specifications are set between 12.35 and 12.65 ounces, deter_x0002_mine which of the machines are capable of producing within specification	K4	(8)
6)	How would you apply TPM principles to optimize equipment reliability and minimize unplanned downtime in a manufacturing facility?	K5	(10)
7)	How does the A3 problem-solving approach facilitate communication and collaboration within teams?	K5	(10)

8) A quality control inspector at the Parle agro company has taken twenty-five samples with four observations each of the volume of bottles filled. The data and the computed means are shown in the table. If the standard deviation of the bottling operation is 0.14 ounces, use this information to develop control limits of three standard deviations for the bottling operation. K5 (15)

Sample Number	Observations (bottle volume in ounces) 1	2	3	4
1	15.85	16.02	15.83	15.93
2	16.12	16.00	15.85	16.01
3	16.00	15.91	15.94	15.83
4	16.20	15.85	15.74	15.93
5	15.74	15.86	16.21	16.10
6	15.94	16.01	16.14	16.03
7	15.75	16.21	16.01	15.86
8	15.82	15.94	16.02	15.94
9	16.04	15.98	15.83	15.98
10	15.64	15.86	15.94	15.89

9) How do you apply Kanban systems to regulate the flow of materials and maintain optimal inventory levels at an aerated beverage compay like Pepsico? K6 (12)

10) In the cotton industry, maintaining consistent quality throughout the production process is crucial to meet customer requirements and ensure competitiveness in the market. Statistical Process Control (SPC) plays a vital role in achieving this objective by monitoring and controlling production processes. This case study illustrates the concept of "in-control" and "out-of-control" processes in SPC within a cotton industry context. SPC involves using statistical methods to monitor and control production processes, aiming to ensure that they operate within specified tolerances and produce consistent quality output. Key components of SPC include establishing control limits, collecting and analyzing data, and taking corrective actions when processes deviate from the desired performance. An in-control process is one that is operating consistently and predictably within established control limits. In a cotton manufacturing setting, an in-control process would exhibit stable performance, with variations in product quality or production output occurring within expected limits. Control charts, such as X-bar and R charts, are used to monitor key process parameters (e.g., fiber quality, yarn strength) over time and determine if the process is in control. An out-of-control process is characterized by unpredictable variations or deviations from the established control limits. In the cotton industry, an out-of-control process may result in defects in the final product, such as irregular yarn thickness or uneven dyeing. When a process is out of control, it may exhibit trends, shifts, or patterns in the data that indicate non-random variation. Prompt identification of out-of-control processes is critical to prevent the production of defective products and minimize waste. In a cotton spinning mill, the production process involves several stages, including carding, combing, spinning, and winding. The quality of the yarn produced is influenced by various factors, such as fiber length, cleanliness, and moisture content. To ensure consistent quality, the mill implements SPC techniques and monitors key process parameters using control charts. K6 (18)

Questions:

1. Why is Statistical Process Control (SPC) important in the cotton industry, and how does it contribute to maintaining product quality? (6 Marks)
2. Can you explain the concept of control limits and their significance in monitoring production processes in a cotton spinning mill? (6 Marks)
3. How are control charts used to distinguish between in-control and out-of-control processes in the context of cotton manufacturing? (6 Marks)