Name: **Enrolment No:**	UPES UNIVERSITY OF TOMORROW

UPES

End Semester Examination, May 2025

Course: Total Quality Management **Semester: VI**

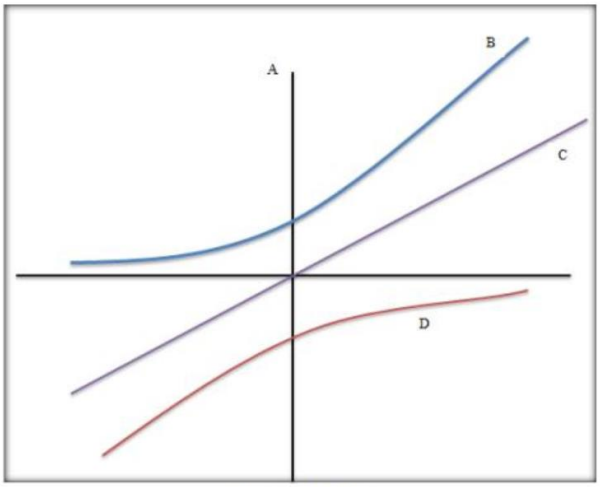
Program: INT-BBA-MBA-VI **Time: 03 hrs.**

Course Code: LSCM3004 **Max. Marks: 100**

SECTION A

10Qx2M=20Marks

S. No.		Marks	CO
Q 1	Statement of question		
1.1	A car manufacturer introduces stricter quality control checks during production to minimise product variability and maintain uniform standards. Which quality concept are they implementing? a) Right the First Time b) Meeting Customer's Requirements c) Consistency d) Continual Improvement	**2**	**CO1**
1.2	Twenty samples of size 8 are taken from a stable process. The average means of the sample means is 31.5, and the average range of the samples is 2.9. What is the LCL for the X-bar chart?	**2**	**CO1**
1.3	A manufacturer ensures that its televisions meet all the specified standards and quality guidelines, with each unit adhering strictly to design specifications. This is a typical example of which specific dimension of manufacturing quality? a) Performance b) Reliability c) Conformance d) Aesthetics	**2**	**CO1**
1.4	Which of the following statements are correct? a. The OC curve plots the probability of accepting the lot for a range of proportions of defective items b. A graphic display of the performance of a sampling plan, showing the probability of accepting the lot for a range of proportions is called Exponential curve c. Chance of committing type I error which means accepting a good lot d. None of the above	**2**	**CO1**
1.5	**Assertion:** A robust VOC program can increase customer engagement and loyalty. **Reason:** Customers are more likely to remain loyal to companies that demonstrate they value and act on customer feedback.	**2**	**CO1**

	a) Both assertion and reason are true, and the reason is the correct explanation for the assertion. b) Both assertion and reason are true, but the reason is not the correct explanation for the assertion. c) The assertion is true, but the reason is false. d) The assertion is false, but the reason is true.		
1.6	Which statement is correct? a) In a stable process, the gap between UCL & LCL is always higher than tolerance b) In a stable process, the gap between UCL & LCL is always lower than tolerance c) There is no relationship between UCL, LCL & tolerance. d) All of the above.	**2**	**CO1**
1.7	When a product is robust, it is _____?	**2**	**CO1**
1.8	The roof of the House of Quality shows the interrelationships between_____and _____.	**2**	**CO1**
1.9	The quality loss function is given by $L(x) = k(x-N)^2$. What does 'N' stand for?	**2**	**CO1**
1.10	The following figure represents a Kano model. The symbols A, B, C and D represent……  Kano Model	**2**	**CO1**
SECTION B **4Qx5M= 20 Marks**			
Q 2	Statement of question	**Marks**	**CO**
2.1	Consider a multi-specialty hospital. Describe special causes and common causes of variation in this setting. Discuss briefly.	**5**	**CO2**
2.2	Explain briefly the difference between a p-chart and a np-chart.	**5**	**CO2**
2.3	Illustrate with a simple, real-world example where applying DFMEA would add significant value.	**5**	**CO2**
2.4	You are the Quality Manager at a manufacturing unit in Govind Industries that produces precision components for the automotive sector. Lately, there has been a rise in customer complaints regarding components not meeting	**5**	**CO2**

	the required tolerance specifications. On evaluating the production process, you discover that the process capability index is low and there is considerable variation in the output. What measures would you implement to enhance the process capability and ensure consistent product quality?		
SECTION-C 3Qx10M=30 Marks			
Q 3	Statement of question	**Marks**	**CO**
3.1	In what ways could control charts be applied to your everyday life? Consider how they might be useful in tracking things like your academic progress or performance in sports. Discuss in detail.	**10**	**CO3**
3.2	A regional airline is concerned about its record of on-time performance. The Memphis hub experiences 20 flight operations each day of the week, with the following record of on-time departures for the previous 10 days: 17, 16, 18, 19, 16, 15, 20, 17, 18, and 16. Prepare a control chart to monitor daily on-time performance.	**10**	**CO3**
3.3	Chai Junction, a rapidly growing tea chain in India, is known for its popular "Full Cutting Chai," advertised as containing 150 ml of tea. Recently, a consumer rights group raised concerns that the actual quantity served is less than what is promised. As the quality assurance manager, you have been asked to look into this issue. Describe how you would apply the Six Sigma methodology to investigate and address the problem.	**10**	**CO3**
SECTION-D 2Qx15M= 30 Marks			
Q 4	Statement of question	**Marks**	**CO**
4.1	A laptop manufacturer is in the process of redesigning its laptop casing to better align with user expectations for security, durability, portability, noise minimization, lightweight construction, and aesthetic appeal. As part of this initiative, translating these user needs into actionable technical specifications—such as material selection, locking mechanisms, thermal insulation, and hinge design—becomes essential. During this process, attention must be paid to potential trade-offs or conflicts among the technical requirements. Emphasis should be placed on identifying which specifications will have the greatest impact on user satisfaction and product performance. Prioritizing these elements effectively can guide engineering and design decisions to ensure a successful product redesign.	**15**	**CO4**
4.2	A restaurant believes that two of the most important factors that help it attract and retain customers are the price of the item and the time taken to serve the customer. Based on the price for similar items in other neighboring restaurants, it is estimated that the customer tolerance limit for price is $8, and the associated customer loss is estimated to be $50. Similarly, the customer tolerance limit for the service time is 10 minutes for which the associated customer loss is $40. A random sample of size 10 yields the following values of price: 6.50, 8.20, 7.00, 8.50, 5.50, 7.20, 6.40,	**15**	**CO4**

	5.80, 7.40, 8.30. The sample service times (in minutes) are 5.2, 7.5, 4.8, 11.4, 9.8, 10.5, 8.2, 11.0, 12.0, 8.5. Find the total expected loss per customer. If the restaurant expects 2000 customers monthly, what is the expected monthly loss?		