JAIPURIA INSTITUTE OF MANAGEMENT

JAIPURIA INSTITUTE OF MANAGEMENT, NOIDA

PGDM / PGDM (M) / PGDM (SM)

FIFTH TRIMESTER (Batch 2023-25)

ENDTERM EXAMINATION, Jan-2025

Course Name	Total Quality Management (TQM)	Course Code	20528
Max. Time	2 hours	Max. Marks	40 MM

INSTRUCTIONS:

a. This is a closed book exam.
b. Answering all questions is compulsory.
c. Using calculators is allowed; however, exchange of calculators is strictly prohibited.

1) Monika works for a software company as a technical support representative. Her duties include answering the telephone, providing information to customers, and troubleshooting technical problems. Her supervisor told her to be courteous and not to rush callers. However, the supervisor also told her that she must answer an average of 15 calls per hour so that the department's account manager can meet his or her budget. Monika comes home each day frustrated because the computer is slow in delivering information, causing her to search for the information in complex manuals. When she is pressed for time, she often cuts the call off prematurely or provides only the minimal information necessary.
   a. Assuming yourself to be Supervisor Deming, examine the present situation? Explain which of the 14 Points might be violated. (5 Marks)
   b. Drawing upon Deming's principles, develop a plan to improve this situation. (5 Marks)
2) During one month, MegaInvCo (MIC) processed 51,000 invoices for Apiha Corp; 49,000 for Beta Corp; and 25,000 for Gamma Corp. Of these, 510 of the Alpha, 525 of the Beta, and 480 of the Gamma invoices had to be reprocessed for errors.
   a. Determine the overall defect rate for all of the combined batches? Also, compute and discuss for each individual batches? (5 Marks)
   b. Develop a fishbone diagram for the possible causes of flight delays. (5 Marks)
3) Nexinia, Inc. is working on a design for a new smart phone. Marketing staff conducted extensive surveys and focus group discussions with potential customers to determine the characteristics that the customers want and expect in a smart phone.
   a. Compile the possible customer requirements, voice of customers at least five, identified from the above-mentioned exercise. (5 Marks)
   b. Develop a set of technical requirements to incorporate into the design of a House of Quality relationship matrix. (5 Marks)

4) Completed forms from a particular department of an insurance company were sampled daily to check the performance quality of that department. To establish a tentative norm for the department, one sample of 100 units was collected each day for 15 days, with these results.

Sample	Sample Size	Number of forms with Errors	Sample	Sample Size	Number of Forms with Errors
1	100	4	9	100	4
2	100	3	10	100	2
3	100	5	11	100	7
4	100	0	12	100	2
5	100	2	13	100	1
6	100	8	14	100	3
7	100	1	15	100	1
8	100	3			

a. Compute the control limits for developing a p-chart using a 95 percent confidence interval (z=1.96) for the data. (5 Marks)

b. Plot the collected 15 samples and construct the p-chart using. Interpret the process based on the observations made after constructing the chart. (5 Marks)

Important indices and formulas:

$$UCL = \bar{p} + zs_p$$

$$LCL = \bar{p} - zs_p; \text{ or 0 if less than 0}$$

$$s_p = \sqrt{\frac{\bar{p} * (1 - \bar{p})}{n}}$$

	Control Chart Factors						
n	A2	D3	D4	d2	A3	B3	B4
2	1.88	0	3.267	1.128	2.659	0	3.267
3	1.023	0	2.574	1.693	1.954	0	2.568
4	0.729	0	2.282	2.059	1.628	0	2.266
5	0.577	0	2.114	2.326	1.427	0	2.089
6	0.483	0	2.004	2.534	1.287	0.03	1.97
7	0.419	0.076	1.924	2.704	1.182	0.118	1.882
8	0.373	0.136	1.864	2.847	1.099	0.185	1.815
9	0.337	0.184	1.816	2.97	1.032	0.239	1.761
10	0.308	0.223	1.777	3.078	0.975	0.284	1.716