**JAIPURIA INSTITUTE OF MANAGEMENT, INDORE**

**PGDM**

**FIRST TRIMESTER (Batch 2019-21)**

**MID TERM EXAMINATION, AUGUST-2019**

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| Course Name | **Quantitative Techniques** | Course Code | OM-101 |
| Max. Time | **1 hour** | Max. Marks | **20** |

*Attempt all questions. Statistical tables will be provided on request.*

Q1. “Fun & Cream Bakery” produces specialised birthday cakes. The demand of cake is fairly even and is not dependent on day of the week or festive seasons etc. Each cake costs Rs. 200/- and is sold in Rs. 600/-. However, at the closing hour of the bakery, all the unsold cakes can be sold at Rs. 50/- per cake to “Need-n - Food” (a charitable organisation, for distribution of food in slum areas) for under privileged citizens.

Mr. Shyam Kishan, the owner of the bakery wishes to optimise his profit. So he has gathered data for cake demand for past 50 days: -

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 30 | 30 | 32 | 31 | 33 | 35 | 35 | 32 | 33 | 31 | 33 | 30 | 34 | 34 | 35 | 33 | 32 |
| 33 | 31 | 32 | 33 | 33 | 33 | 34 | 35 | 34 | 32 | 31 | 33 | 32 | 31 | 34 | 34 | 35 |
| 33 | 32 | 33 | 31 | 34 | 35 | 33 | 34 | 32 | 31 | 32 | 33 | 33 | 34 | 35 | 32 |  |

 At the same time, “Evolution Research” a consultancy company has offered marketing research service with 100 % accuracy on cake demand at a consulting charge of Rs. 300/- per day as consulting fees.

1. Perform exploratory data analysis on the above data.
2. Does above data support Chebyshev theorem?
3. How many cakes Mr. Ravi Kumar should make?
4. Should Evolution Research be engaged for market research?

**(12 Marks)**

Q2. “Acumen” is a training organisation imparting sales training to corporate clients. The company has developed a software for training of participants. This unique software allows each trainee to complete the training programme at his/her own pace. Acumen further observed that the training completion time of participants on this software follows normal distribution with an average of 20 hours and standard deviation of 3 hours.

 Mr. Kaushik Sharma, General Manager (HR) of a FMCG company, approached “Acumen” for training of his employees on this software. His company has 200 salesmen who were identified for this training programme. In addition to providing training, Mr. Sharma also wanted to classify his salesmen into four different categories: - Genius (GN) who could complete training in 13 hrs or less, Above Average (AA) who can complete training in 13 – 17 Hrs, Average (AV) who could complete training in 17 -24 hrs and Laggards (LG) who will need more than 24 hrs to complete the training program. This information will help Mr. Sharma in conducting performance appraisal, manpower planning and for infusion of new talent. How many employees are expected in each of these four categories? **(8 Marks)**