Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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|  |  |  |  |
| **Code :** | **18MS3004** | **Duration :** | **3hrs** |
| **Sub. Name :** | **QUANTITATIVE TECHNIQUES FOR MANAGEMENT** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q. No. | Sub Div. | **Questions** | **CO** | **Marks** |
| 1. | a. | Discuss the application of Statistics in Business with examples. | CO1 | 20 |
| **(OR)** | | | | |
| 2. | a. | Determine the Mean, Median and Mode from the following frequency distribution.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Class | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | | Frequency | 45 | 46 | 43 | 67 | 56 | 45 | | CO2 | 20 |
|  |  |  |  |  |
| 3. | a. | Find the third, fifth and ninth deciles for the given data set.   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Class | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | | Frequency | 3 | 6 | 10 | 12 | 16 | 12 | 9 | 6 | 2 | | CO3 | 10 |
|  | b. | Find the 14th and 83rd percentile of the frequency distribution given:   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Class | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | | Frequency | 9 | 10 | 14 | 17 | 19 | 16 | 11 | 4 | | CO3 | 10 |
| **(OR)** | | | | |
| 4. | a. | State Chebyshev’s Theorem. Illustrate the empirical rule using the normal curve. | CO5 | 10 |
|  | b. | The price of two commodities over 10 weeks are given below.   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | A | 54 | 55 | 53 | 56 | 52 | 52 | 58 | 49 | 50 | 51 | | B | 108 | 107 | 105 | 106 | 105 | 103 | 102 | 104 | 104 | 101 |   Find out the Standard deviations and calculate the Coefficients of variation of the two sets of data and find out which set of data shows less variation. | CO4 | 10 |
|  |  |  |  |  |
| 5. | a. | Assume that a firm has selected a random sample of 100 from its production line and obtained the data shown in table below:   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | class | 130-134 | 135-139 | 140-144 | 145-149 | 150-154 | 155-159 | 160-164 | | Freq | 3 | 12 | 21 | 28 | 19 | 12 | 5 |   Compute the Karl Pearson’s coefficient of skewness | CO5 | 20 |
| **(OR)** | | | | |
| 6. | a. | Define Probability. Explain the types of Probability with real time examples. | CO4 | 10 |
|  | b | Smoothing techniques are used to smooth out the random variations due to irregular variations. Elucidate the various types of smoothing techniques. | CO5 | 10 |
|  |  |  |  |  |
| 7. | a. | Ten newly recruited engineers of Prudential Technology Solutions are given an intensive 3 months training on two topics, namely Design of algorithm and Project management. At the end of the training, the ten engineers took a test for both the topics. The ranks obtained by them in both the tests are given in table below. Using the Spearman rank coefficient of correlation, find if there is any relationship between the marks scored in design of algorithm and project management.  Rank of the score in two tests   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Newly recruited engineers | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | Algorithm score rank (X) | 5 | 10 | 6 | 1 | 8 | 2 | 9 | 3 | 4 | 7 | | Project Mgt Score rank (Y) | 1 | 6 | 2 | 7 | 4 | 5 | 8 | 9 | 10 | 3 | | CO6 | 20 |
| **(OR)** | | | | |
| 8. |  | Calculate the correlation coefficient from the following data of marks obtained in Commerce (X) and Economics (Y) and verify if there is any relation between the two:   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | X | 50 | 60 | 58 | 47 | 49 | 33 | 65 | 43 | 46 | 68 | | Y | 48 | 65 | 50 | 48 | 55 | 58 | 63 | 48 | 50 | 70 | | CO6 | 15 |
|  | b. | Describe the procedure for hypothesis testing for F statistics. | CO6 | 5 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | In an industry, 200 workers employed for a specific job, were classified according to their performance and training received/not received to test the independence of a specific training and performance. The data is summarized as follows:   |  |  |  |  | | --- | --- | --- | --- | |  | Performance | | Total | |  | Good | Not Good |  | | Trained | 100 | 50 | 150 | | Untrained | 20 | 30 | 50 | | Total | 120 | 80 | 200 |   Use Chi-Square test of independence at 5% level of significance and state your conclusion.  Extract of Chi Square table is given below:   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Degree of freedom | Level of Significance | | | | |  | 0.20 | 0.10 | 0.05 | 0.02 | | 1 | 1.642 | 2.706 | 3.841 | 5.412 | | 2 | 3.219 | 4.605 | 5.991 | 7.824 | | 3 | 4.642 | 6.251 | 7.815 | 9.837 | | 4 | 4.989 | 7.779 | 9.488 | 11.668 | | CO5 | 20 |