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| **Small Samples: T test** |
| **Tutorial No. 1**   1. Nine items of a sample had following values 45, 47, 50, 52, 48, 47, 49, 53, 51. Does the mean of 9 items differ significantly from the assumed population mean 47.5? 2. The annual rainfall at a certain place is normally distributed with mean 30. If the rainfall during the past 8 years are 31.1, 30.7, 24.3, 28.1, 27.9, 32.2, 25.4 and 29.1, can we conclude that average rainfall during the past 8 years is less than the normal rainfall? (LOS 1%) [Ans. t=1.44, H0 accepted] 3. The average breaking strength of steel rods is specified to be 18.5 thousand kg. For this sample of 14 rods was tested. The mean and sd obtained were 17.85 and 1.955 respectively. Test the significance of the deviation.[Ans t=-1.24, Null hypothesis accepted] 4. An automobile tyre manufacturer claims that the average life of a particular grade of tyre is 20000 km when used under normal conditions. A random sample of 16 tyres was tested and a mean and SD of 22000 km and 5000 km, respectively were computed. Assuming the life of the tyres in km to be approx.. normally distributed, decide whether the manufacturer’s claim is valid. [Ans:t=1.735, H0 accepted.] 5. The following data relate to the marks obtained by 11 students in 2 tests, one held at the beginning of a year and the other at the end of the year after intensive coaching.  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Test 1 | 55 | 60 | 65 | 75 | 49 | 25 | 18 | 30 | 35 | 54 | 61 | 72 | | Test 2 | 63 | 70 | 70 | 81 | 54 | 29 | 21 | 38 | 32 | 50 | 70 | 80 |   Do the data indicate that the students have benefited by coaching?  [Ans. t=4.0, H0 rejected]   1. The mean life of a sample of 10 electric bulbs was found to be 1456 hrs with SD of 423 hrs. A second sample of 17 bulbs chosen from a different batch showed a mean life of 1280 hrs with SD of 398 hrs. Is there a significant difference between the means of the two batches.[ANs:1.085, H0 accepted] 2. 11 sales executive trainees are assigned selling jobs right after their recruitment. After a fortnight they are withdrawn from their field duties and given a month training. Sales executed by them in thousands of Rs. Before and after the training in the same period are listed below:  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Sales before training | 23 | 20 | 19 | 21 | 18 | 20 | 18 | 17 | 23 | 16 | 19 | | Sales after training | 24 | 19 | 21 | 18 | 20 | 22 | 20 | 20 | 23 | 20 | 27 |   Do these data indicate that the training has contributed to their performance? [Ans t=2.150, H0 accepted] |