SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)
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COIMBATORE-641 035, TAMIL NADU

Department of Mathematics
UNIT 1

PART B

1. A random sample of 10 boys had the following I.Q's 70,120,110,101,88,83,95,98,107,100. Do these data support the assumption of a population mean I.Q's of 100? Find a reasonable range in which most of the mean I.Q's values of sample of 10 boys lie.

2. Below are given the gain in weights of pigs fed on two diets A and B

Diet A	**25**	**32**	**30**	**34**	**24**	**14**	**32**	**24**	**30**	**31**	**35**	**25**	**-**	**-**	**-**
Diet B	**44**	**34**	**22**	**10**	**47**	**31**	**40**	**30**	**32**	**35**	**18**	**21**	**35**	**29**	**22**

Test if the two diets differ significantly as regards their effect on increase in weight.

3. Two random samples gave the following results

Sample	Size	Sample mean	Sum of squares of deviations from the mean
1	10	15	90
2	12	14	108

Test whether the samples come from the same normal population.

4. A cigarette manufacturing firm claims that its brand A line of cigarettes outsells its brand B by 8%. If it is found that 42 out of a sample of 200 smokers prefer brand A and 18 out of another sample of 100 smokers prefer brand B, test whether the 8% difference is a valid claim.

5. The random samples were drawn from two normal populations and the following results were obtained.

Sample I 16 17 18 19 20 21 22 24 26 27

Sample II 19 22 23 25 26 28 29 30 31 32 35 36

Obtain estimates of the variances of populations and test whether the two populations have the same variances.

6. In one sample of 10 observations from a normal population, the sum of the squares of the deviations of the sample values from the sample mean is 102.4 and in another sample of 12 observations from another normal population, the sum of the squares of the deviations of the sample values from the sample mean is 120.5. Examine whether the two normal populations have the same variances.

7. The number of automobile accidents per week in a certain community are as follows: 12, 8, 20, 2, 14, 10, 15, 6, 9, 4. Are these frequencies in agreement with the belief that accident conditions were the same during this 10 week period.

8. The following figures show the distribution of digits in numbers chosen at random from a telephone directory.

Digits	0	1	2	3	4	5	6	7	8	9
Frequency	1026	1107	997	966	1075	933	1107	972	964	853

Test whether the digits may be taken to occur equally frequently in the directory.

9. **In an experimental on immunization of cattle from tuberculosis the following**

research were obtained.

	Affected	**Not affected**
Inoculated	**12**	**26**
Not Inoculated	**16**	**6**

Calculate ψ^2 and discuss the effect of vaccine in controlling susceptibility to tuberculosis.

10. The Mean breaking strength of the cables supplied by a manufacturer is 1800 with an SD of 100. By a new technique in the manufacturing process, it is claimed that the breaking strength of the cable has increased. To test this claim a sample of 50 cables is tested and is found that the mean breaking strength is 1850. Can we support the claim at 1% level of significance.

11. A simple sample of heights of 6400 English men has a mean of 170 cm. and a S.D of 6.4 cm, while a simple sample of heights of 1600 Americans has a mean of 172cm. and a S.D of 6.3 cm. Do the data indicate that Americans are the average taller than the English men?

12.

In a sample of 600 students of a certain college 400 are found to use dot pens. In another college, from a sample of 900 students 450 were found to

use dot pens Test whether the two colleges are significantly different with respect to the habit of using dot pens.

13 .Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favour of the proposal. Test the hypothesis that proportions of men and women in favour of the proposal are same, at 5% level.

14. In a sample of 400 parts manufactured by a factory, the number of defective parts was found to be 30. The company, however, claimed that only 5% of their product is defective. Is the claim tenable?

15. 40 People were attacked by a disease and only 36 survived. Will you reject the hypothesis that the survival rate, if attacked by this disease, is 85% in favour of the hypothesis that it is more at 5% level of significance.