



(An Autonomous Institution)

Coimbatore– 35

DEPARTMENT OF MATHEMATICS

UNIT- IV TESTING OF HYPOTHESIS

JEST OF SIGNIFICANCE OF LARGE SAMPLES : JEST JOR SINGLE MENN : Null Hypothesis, 110 : H. Mo Most statistics, $z = \frac{5i - \mu}{\sigma/v_n}$ (or) $z = \frac{5i - \mu}{s/v_n}$ 1) A sample of goo members is found to have a mean of 3.4 cm and s.D. 2.61 cms. Is the sample from a large population of mean 3.25 cm and 8. D. 2.61 cms. by the -population & normal and its mean is untender -find the 95% confidential (geducial) limits of true mean. Soln: Given: n= 900, n= 3.4, H= 3.25, J= 2.61 Slepis Formulating Ho & H1: Ho: H= 3.25 H1: H\$ 3.25 (two failed but) Step 2: Level of right ficance = 5 % = 0.05 slep 3 : Test statestic, z = - 1/10 = 3.4 - 3.25 2.61 V900 =1.724 step 4: critical value at 5% is Za=1.96. steps: conclusion: since 121=1.724 < 1.96= 24, Ho & accepted at 5%. Level & significance. . The sample & taken from population where mean 3.25 cm .

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2) A random sample a 200 employees at a large corporation schewed theis average to be the systems with a s.D.g 6.89 years. Fest The hypotheries Ho: H= 40, HI: H>40 at a : c. c. level g significan Sofn: given: n= 200, n= 42.8, H=40, J=689 step 1: Formulating Ho and H, : Ho: M= 40 H1: 4>40 (one fail test - right) steps : Level of significance, x= 0.01. slaps: Test statistic, Z= 51-H = 42.8 - 40 6.89 = 5.747 step 4: Critical value at 1.1. (one tailed - sight) \$ Zy = 2.33 step 5: Conclusion: since 121=5.444 > 2.33 - 2. : Ho & rejected at 1% Level 9 significance . The hypothesis, M, : H>40 is accepted.



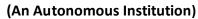


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3) The mean height of college students in a city are normally distributed with 3.2.6 cms. A-sample of 100 students has mean height of 158 cms. Test the hypothesis that the mean height of college students In the city the (mi Ale obtain 99% confidence limits for the true mean . An: given: n= 100, 7 = 158, H= 160, J=6 step 1: Formulating Ho and HI, : Ho: N= 160 HI : H # 160 (two tailed test) steps : Level & significance, a =14 sleps: Test statister, z = 2-H = 158 - 160 6/100 = 3.33 Step 4: ceitical value at 1%. (two side test) is 20 = 2.58. steps: conclusion; Sunce 121= 3.33 > 2.58 = 22 . Ho is rejudic at 1% level of significance. . . The mean height of the college students in the city is 160 cms is not true.







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UNIT-IV TESTING OF HYPOTHESIS

JEST JOR DIFFERENCE FOR TWO MEANS : Null -hypothesis : Ho : H1 = H2 -lest statistic, $z = \frac{\overline{x_1} - \overline{x_2}}{\sqrt{n_1} + \frac{\sigma_2^2}{n_2}}$ $\sigma_1 = \sigma_2 = \sigma$ = n1 - 22 $(or) \qquad Z = \frac{\overline{2}c_1 - \overline{3}c_2}{\sqrt{\frac{5}{0}} + \frac{5a^2}{02}},$ Whe means of two principle large samples of loco or of a 2000 members are 67.5 inches and 68 inches reys. Can the samples be regarded as drawn from the same population of standard deviation of as incher, Test at 5% level of highificance (Los) <u>soln:</u> -given: n, = 1000, n, = 67.5, ng= 2000, x2= 68, & J= 2.5 estep 1: Formulating Ho and HI ! $H_0 = \mu_1 = \mu_2$ HI: HI & Ha (two tailed test) slepa: Level q significance, a = 5% = 0.05

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Slép 3: Test statistie, $z = \frac{\pi_1 - \pi_2}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$ $= \frac{6\pi \cdot 5 - 68}{2 \cdot 5\sqrt{\frac{1}{1000} + \frac{1}{2000}}}$ = -5.164 $1z_1 = 1 - 5.1641$ = 5.164Step 4: certical value, at 5%. Ctroo scioled test) $g \ z_x = 1.96$. Step 5: Conclusion: $z = 5.164 > 1.96 = z_x$ \therefore Ho is sufficient of z < 1.05. \therefore The samples cannot be regarded as drawn from the same population of 3.0.25 inches.

MA rimple sample q height q 6400 sailors has a mean q 67.85 inches and s.D. g 2.56 inches while a simple sample q heights q 1600 sotoliers has a mean q 68.55 inches and s.D. g 2.50 inches. Do The data, indicate that sotoliers are on the average talles than sailors? use 51. Los.





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<u>Soln:</u> equiven: Spilors: n, = 6400, 5, =67.85, 8, =2.56 Soldier: no = 1600, no= 68.55, So= 2.52 Step 1: Formulating Ho and H, Ho: HI = H2. H1: M1 < H2 cone tailed test- heft) Step 2 : Los at 5 %. as x=0.05 step 3: Test statistic, Z = X1 - X2 $\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}$ = 67.85-68-55 (2.56)2 + (2.52)2 6400 + (600 = - 9.91 121=1-9.91) = 9.91 step 4: critical value at 5% (one tail but) is xy = 1.645 step 5: Conclusion: z= 9.91>1.645= zx . Ho is rejected at 5% g Los ... The data indicates that soldiers are on the average faller than sailors.

> * A semple sample of heights of 6400 English men thas a mean of 170 cm & 3.D. of 64 cm, while a simple sample of theights of 1600 Americans has a mean of 172 cm & 3.D. of 6.3 cm. No the clata indicate that Americans are the arg. talks than the english men ? [z = 11.32, H, < M. Americans are talle than English mer]

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