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DEPARTMENT OF MATHEMATICS UNIT – I TESTING OF HYPOTHESIS

JESJ FOR SINGLE PROPORTION : a certain attributes in a sample q 'n' êtems ou person then the sample proposition, $p' = \frac{n}{n}$ Nall hypothesis, Ho: p=po where p'is population proportion HI: P# P Test statistic, $z = \frac{p'-p}{\sqrt{\frac{p_v}{p}}}$ where q = 1-p. 1) A coin is based 256 times and 132 heads are Obtained . would you conclude that The cos is a biared one? soln: epiven: n=256, n=132 noig heads population prop? $P = \frac{1}{2}$ & $p' = \frac{3L}{n} = \frac{132}{256} = 0.5156$ & q = 1-P q-yetting head $= \frac{1}{2}$ & $p' = \frac{3L}{n} = \frac{132}{256} = 0.5156$ $= \frac{1}{2}$ Ho: The coin is unbiased one (u) Ho: P= 1/3 H1: The coin & brased one (is H, : p = 1/2 Slep 2: Los, x = 5 1/ = 0.05

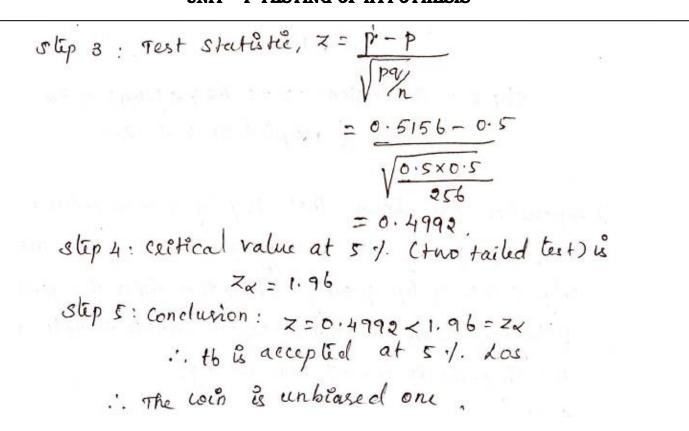




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An a big city 325 men out q boomen were found to be smokers. Does this information support the conclusion that the majority of men in this city are mokers? [7=2.06, H:P>0.5 Majority of men in this city are mokers]





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2) Twenty people were affected by cholera and out of them only eighteen survived, would you reject the hypotheses that the survival rate, if affected by cholese is 85% is favour of the hypothesis that it is more at 5% Los <u>Soln:</u> given: n= 20, p= 85% (2) p= 85 = 0.85 n = 18 $p' = \frac{18}{20} = 0.9$ 89 = 1-p= 0.15 Step 1: Formulating Ho and H, Ho: p = 0.85, a) pepoles serviced ofter attack H1: p \$ 0.85 (one tailed bet) step 2: Los x = 5% = 0.05 steps: Test statistic, Z = P-P VP9/n $= \frac{0.9 - 0.85}{\sqrt{0.85 \times 0.15}}$ sliph: critical value at 57. (one tailed test) is $Z_{x} = 1.645$





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steps: Conclusion: z=0.626×1.645=Zx ... Ho is accepted at 5 1/. LOS.





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=-3.75 (2 = 3.75 step 4: critical value at 5 %. (two tailed test) is $Z_{x} = 1.96$ steps: Condución: z= 3.75>1.96 = zx : Ho is rejected at 5.1. Los The dauperduction of the day taken was not a representative sample of the hypothesis of 20% was wrong 4) In a sample of 500 peoples is kerala 280 are tea drinkers, othe rest are cappee drinkers. It can be arrune that both coffee and tea are equally popular to the state at 5% Los. Soln: given: n = 500, n = 280, $p' = \frac{n}{n} = \frac{280}{500} = 0.56$ $p = \frac{1}{2}$ That is, population proportion of tea durkers $8 q = 1 - p = y_2$ Step1: Formulating How HI Ho : P=1 HI: P = 15 (two tailed test) slip 2: Los at 5.1. (2) x=0.05 step 3: Test statistic, $z = \frac{p!-p}{\sqrt{p_{1/n}}} = \frac{0.5b - 0.5}{\sqrt{\frac{0.5 \times 0.5}{500}}} = 2.68$ step 4: critical value at 5.1. (two tailed test) is 7~ = 1.96



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UNIT - I TESTING OF HYPOTHESIS

JEST JOR DIFFERENCE OF PROPORTIONS;

.

Null hypothesis, Ho:
$$P_1 = P_2$$
.
Test statistic, $Z = \frac{P_1 - P_2}{\sqrt{PQ(\frac{1}{n_1} + \frac{1}{n_2})}}$ where $P_1 = \frac{n_1}{n_1} \frac{a_1 P_2}{a_1 P_2} \frac{n_2}{n_1}$
and $P = \frac{P_1 n_1 + P_2 n_2}{n_1 + n_2} = \frac{n_1 + n_2}{n_1 + n_2} = \frac{a_1 + n_2}{n_1 + n_2}$





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) Random Samples of 400 men and 600 women were asked whether they would like to have a flyover near their sendence, 200 men and 325 women were in favour of the propusal. Test the Rypothesis that peoportions of men and women is favour & the peoposal, are same against that they are not, at 5% level. Soln: Given: n= 400, men, x= 200 ng= 600, women, ng= 325 $P_1 = \frac{\chi_1}{n_1} = \frac{200}{400} = 0.5 \quad \& P_2 = \frac{\chi_2}{n_2} = \frac{325}{400} = 0.541$ $P = \frac{\lambda_1 + \lambda_2}{n_1 + n_2} = \frac{200 + 325}{400 + 600} = 0.525 \quad \& q = 1 - P$ step 1: Formulating Ho and H, Ho: PI = P2, is favour & peoposal ino diff. but them) H1: PIF P2 (two failed test) Step 2: LOS X=51/ =0.05





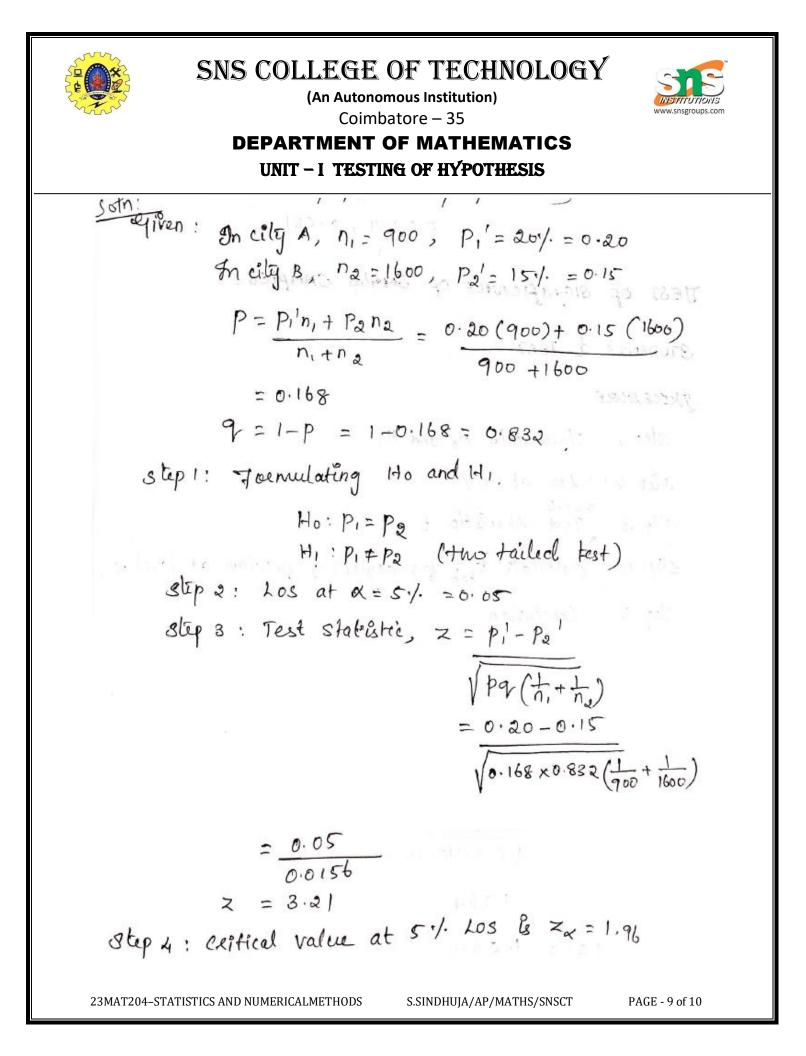
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step 3 : Test statistic,
$$z = P_1! - P_2!$$

 $\sqrt{Pq} \left(\frac{1}{n_1} + \frac{1}{n_2}\right)$
 $= 0.5 - 0.541$
 $\sqrt{0.525 \times 0.475} \left(\frac{1}{4100} + \frac{1}{6x0}\right)$
 $= -\frac{0.041}{\sqrt{0.001039}}$
 $= -1.269$
 $Izl = 1.269$
 $Izl = 1.269$
 $Step 4 : Cliffical value at 5.1. Los & $z_x = 1.96$.
 $Step 5 : Conclusion : $z = 1.269 \times 1.96 = 2x$
 \therefore Ho & accepted the 5.1. Los .
 \therefore Hie men & women do not differ significantly
as regards proposal of Hyover & concerned.
 as regards proposal of Hyover & concerned.
 as An a large alty A, so 1. 9 a Random sample of 900 school
children had dejective eye-sight. In other large city B, 15%.
 g random sample of 1600 children had the same
 $deject. Is the difference between the two proportions
 $significant ?[Obtain 95%. confidence limits for the
difference G the population proportions $J$$$$$







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step 5 : Conclusion: $z=3.21 > 1.96 = Z_{x}$... Ho & reflected at 5%. Los. ... The difference between the two proportions is Significant. Confidence Limit: difference $P_{1}'-P_{2}' =$ $(P_{1}'-P_{2}') \pm 1.96 \int Pq(\frac{1}{n}, \pm \frac{1}{n_{2}})$ $= (0.20 - 0.15) \pm 1.96 (0.156)$ $= 0.05 \pm 0.031$ = 0.019, 0.081