Let P1 and P2 be the true population proportions population 1 and population 2 respectively.

given that,

n1=110,x1=40 & n2=140, x2=60

significance level, α=0.01

We have,

sample proportions are

 p^ 1= x1n1

= 40110

 p^ 1 =0.3636

**Claim:** Is to test that, is there is sufficient evidence to conclude p1<p2 .

**a)** **Option a) A hypothesis test regarding the difference between two population proportion from independent samples.**

**b) The null and alternative hypotheses are,**

**Option B) Ho:P1=P2 vs H1: P1<P2**

**Test Statistic:**

{hatp1-hatp2}/{\sqrt{barP\*barQ({1}/{n1}+{1}/{n2}}}

where,

barP=

{x1+x2}/{n1+n2}

{40+60}/{110+140}

therefore barp

and

barQ=1-barP

thereforebarQ=0.6

therefore Z

{0.3636-0.4286}/{\sqrt{0.4\*0.6({1}/{110}+{1}/{140})}}

c) P-value

Since, distribution of z is symmetric

**Decision rule**: We reject Ho at α % significance level

If, P-value <α

Here,α=0.01 i.e. 1% and **p-value =0.149**

Here, P-value> α

**Therefore we do not reject Ho at 1% significance level.**

**d)**

**Conclusion: There is sufficient evidence at 1% significance level to conclude p1<p2 .**

**a)** **Option a) A hypothesis test regarding the difference between two population proportion from independent samples.**

**b) The null and alternative hypotheses are,**

**Option B) Ho:P1=P2 vs H1: P1<P2**

**c) p-value=0.149**

**d)Conclusion: There is sufficient evidence at 1% significance level to conclude p1<p2 .**