SOMAIYA VIDYAVIHAR UNIVERSITY

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Course: PSOT
Experiment / assignment / tutorial No.
Grade: Signature of the Faculty with date

FA2 C03

Q1) $n_1 = n_2 = 200$
$\bar{x}_1 = 140$
$\bar{x}_2 = 120$
$S_1 = 14$
$S_2 = 12$

1) H_0 : $\bar{x}_1 = \bar{x}_2$
2) H_1 : $\bar{x}_1 > \bar{x}_2$
3) LOS = 1%
4) $\therefore Z_{table} = 2.33$

4) For $Z_{cal} = \dfrac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}} = \dfrac{140 - 120}{\sqrt{\frac{14^2}{200} + \frac{12^2}{200}}} = 15.34$

5) $\because$ $Z_{cal} = 15.34$
$Z_{table} = 2.33$
$\therefore Z_{cal} > Z_{table}$
$\therefore$ Null hypothesis is rejected
$\therefore$ new serum helps to cure disease

$$t_{cal} = \frac{44.67 - 47.5}{13.524/\sqrt{8}} = -0.5919$$

6) $|t_{cal}| < t_\alpha$
null hypothesis is accepted
the mean of 9 items does not differ significantly

Q2) $\bar{x} = \frac{45+47+50+52+48+7+49+53+51}{9}$

$= 44.67$

x	45	47	50	52	48	7	49	53	51
$x-\bar{x}$	0.33	2.33	5.33	7.33	3.33	-37.67	4.33	8.33	6.33
$(x-\bar{x})^2$	0.1089	5.4289	28.4089	53.7289	11.0889	1419.0289	18.7489	69.3889	40.0689

$s^2 = \frac{\Sigma(x-\bar{x})^2}{n} = 182.8889$

$s = 13.5236$

1) $H_0: \mu = 47.5$
2) $H_1: \mu \neq 47.5$
3) Degree of freedom $= 9-1 = 8$
4) Let LOS be 5%
   so $t_\alpha = 2.131$
5) $t_{cal} = \frac{\bar{x}-\mu}{s/\sqrt{n-1}} = \frac{44.67-47.5}{13.5236/\sqrt{8}} = -0.5919$
6) $|t_{cal}| < t_\alpha$
   null hypothesis is accepted
   The mean of 9 items does not differ significantly

SOMAIYA VIDYAVIHAR UNIVERSITY

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Q3)

	Men	Woman	Total
Favour	1154	1103	2257
opposed	475	442	917
Undecided	243	342	585
Total	1872	1897	3769

1) H_0: Sex & attitude have no association
2) H_1: Sex & attitude have association

Table for expected freq:

	Men	Women
Favour	1124	1133
opposed	457	460
undecided	291	294

$$\chi^2_{calc} = \sum \frac{(O-E)^2}{E} = \frac{(1154-1124)^2}{1124} + \frac{(1103-1133)^2}{1133} + \frac{(475-457)^2}{457} + \frac{(442-462)^2}{460} +$$

$$\frac{(243-291)^2}{291} + \frac{(342-294)^2}{294}$$

$$= 0.8 + 0.7944 + 0.70897 + 0.7044 + 7.9175 + 7.8367$$
$$= 18.762$$

Deg of freedom $= (3-1)(2-1) = 2$

LOS $\alpha = 5\%$ $\therefore \chi^2_\alpha = 5.991$

$|\chi^2_{calc}| > \chi^2_\alpha$

H_0 is rejected

There exists relation between sex & attitude.