राष्ट्रियसंस्कृतविश्वविद्यालयः, तिरुपतिः

ONLINE CERTIFICATE PROGRAMME IN

RESEARCH METHODOLOGY IN SANSKRIT EDUCATION (RMSE)

सार्थकतापरीक्षणम्

डा. सोमाशि लक्ष्मीसीतारामशर्मा
सहायकाचार्यः, शिक्षाविभागः
राष्ट्रियसंस्कृतविश्वविद्यालयः, तिरुपतिः

उदा –

	1	2	3	4	5	M	Md.
अ	70	70	70	70	70	70	70
आ	50	60	70	80	90	70	70
इ	55	55	70	75	95	70	70
ई	40	50	70	90	100	70	70

सार्थकतापरीक्षणम्

- न्यादर्शस्य मध्यमानस्य सार्थकतापरीक्षणं क्रियते।
- तत्र T, F पराक्षणानि भवन्ति ।

तत्रापि small group

1. t परीक्षणम्	i. t. test for single mean.
	ii. t test for deference of means
	iii. Paired t test (to test depended variables)
2. F test	Equality of variance

सार्थकतापरीक्षणम् (लघुसमूहस्य)

t परीक्षणम्

i. t. test for single mean.

Single Group, Single mean, Single SD.

ii. t test for deference of means

2 groups, 2 Means, 2 SDs

iii. Paired t test (to test depended variables)

Paired Means & Paired SD

2. F test

Equality of variance (बहूनां समूहानां मध्ये सार्थकता परीक्षणम्)

सार्थकतापरीक्षणम्

t परीक्षणम्

i. t. test

T वितरणपट्टिका (Distribution table) द्वारा यत्र सार्थकतापरीक्षणं क्रियते ।

अत्र SD (σ) स्थाने न्यादर्शप्रामाणिकविचलनं भवति s ।

प्रक्रिया

1. सार्थकतास्तरस्य निर्धारणम्
2. 1 tailed or 2 tailed निर्धारणम् ।

$H_0 - u_1 = u_2$ $H_1 - u \neq u_1$ (1 Tailed) $H_1 - u$ </> u_1 (2 Tailed)

3. स्वतन्त्रसमूहः उत सहसम्बन्धः विद्यते वा ?

t परीक्षणम्

i. t. test

$$t\ cal = \frac{M_1 - M_2}{SED} \qquad SED = \sqrt{\frac{SD_1^2}{N_1} + \frac{SD_2^2}{N_2}} \qquad df = N_1 + N_2 - 2 = 68$$

उदा –	समूहः	संख्या	मध्यमानम्	प्रामाणिकविचलनम्
	बालका: (1)	30	20.5	4
	बालिका:(2)	40	16.2	5

$$t\ cal = \frac{M_1 - M_2}{SED} \qquad SED = \sqrt{\frac{SD_1^2}{N_1} + \frac{SD_2^2}{N_2}}$$

उदा –	समूहः	संख्या	मध्यमानम्	प्रामाणिकविचलनम्
	बालका: (1)	30	20.5	4
	बालिका:(2)	40	16.2	5

$$SED = \sqrt{\frac{SD_1^2}{N_1} + \frac{SD_2^2}{N_2}} \qquad SED = \sqrt{\frac{4^2}{30} + \frac{5^2}{40}}$$

$$SED = \sqrt{\frac{16}{30} + \frac{25}{40}} \qquad SED = \sqrt{\frac{139}{120}} \qquad 1.07$$

$$t\ cal = \frac{M_1 - M_2}{SED} \qquad t\ cal = \frac{20.5 - 16.2}{1.07} = \frac{4.3}{1.07} = 4.01$$

(0.01 = 2.374)

(0.05 = 1.664)

t परीक्षणम् (लघुसमूहस्य)

$$t\ cal = \frac{M_1 - M_2}{SED} \qquad SED = \sqrt{\frac{SD_1^2}{N_1} + \frac{SD_2^2}{N_2}} \qquad df = N_1 + N_2 - 2$$

उदा – समूहः	संख्या	मध्यमानम्	प्रामाणिकविचलनम्
Male (1)	45	27.5	5
Female(2)	40	32.5	4

	1	2	3	4	5
अ	70	65	68	75	80
आ	50	65	73	85	70

t Table

cum. prob	$t_{.60}$	$t_{.75}$	$t_{.80}$	$t_{.85}$	$t_{.90}$	$t_{.95}$	$t_{.975}$	$t_{.99}$	$t_{.995}$	$t_{.999}$	$t_{.9995}$
one-tail	0.50	0.25	0.20	0.15	0.10	0.05	0.025	0.01	0.005	0.001	0.0005
two-tails	1.00	0.50	0.40	0.30	0.20	0.10	0.05	0.02	0.01	0.002	0.001
df											
1	0.000	1.000	1.376	1.963	3.078	6.314	12.71	31.82	63.66	318.31	636.62
2	0.000	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	22.327	31.599
3	0.000	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	10.215	12.924
4	0.000	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	0.000	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	5.893	6.869
6	0.000	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	0.000	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	0.000	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	0.000	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	0.000	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	0.000	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	0.000	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	0.000	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	0.000	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	0.000	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	0.000	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	0.000	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	0.000	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	0.000	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	0.000	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.552	3.850
21	0.000	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.527	3.819
22	0.000	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.505	3.792
23	0.000	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.485	3.768
24	0.000	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.467	3.745
25	0.000	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.450	3.725
26	0.000	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.435	3.707
27	0.000	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.421	3.690
28	0.000	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.408	3.674
29	0.000	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.396	3.659
30	0.000	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.385	3.646
40	0.000	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.307	3.551
60	0.000	0.679	0.848	1.045	1.296	1.671	2.000	2.390	2.660	3.232	3.460
80	0.000	0.678	0.846	1.043	1.292	1.664	1.990	2.374	2.639	3.195	3.416
100	0.000	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.174	3.390
1000	0.000	0.675	0.842	1.037	1.282	1.646	1.962	2.330	2.581	3.098	3.300
z	0.000	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.090	3.291
	0%	50%	60%	70%	80%	90%	95%	98%	99%	99.8%	99.9%
	Confidence Level										

d_f	Level of Significance for Directional Test (t_{crit})					
	$\propto$=0.10	$\propto$=0.05	$\propto$=0.025	$\propto$=0.01	$\propto$=0.005	$\propto$=0.0005
	Level of Significance for Non-directional Test (t_{crit})					
	$\propto$=0.20	$\propto$=0.10	$\propto$=0.05	$\propto$=0.02	$\propto$=0.01	$\propto$=0.001
1	3.0780	6.3140	12.7100	31.8200	63.6600	636.6000
2	1.8860	2.9200	4.3030	6.9650	9.9250	31.6000
3	1.6380	2.3530	3.1820	4.5410	5.8410	12.9200
4	1.5330	2.1320	2.7760	3.7470	4.6040	8.6100
5	1.4760	2.0150	2.5710	3.3650	4.0320	6.8690
6	1.4400	1.9430	2.4470	3.1430	3.7070	5.9590
7	1.4150	1.8950	2.3650	2.9980	3.4990	5.4080
8	1.3970	1.8600	2.3060	2.8960	3.3550	5.0410
9	1.3830	1.8330	2.2620	2.8210	3.2500	4.7810
10	1.3720	1.8120	2.2280	2.7640	3.1690	4.5870
11	1.3630	1.7960	2.2010	2.7180	3.1060	4.4370
12	1.3560	1.7820	2.1790	2.6810	3.0550	4.3180
13	1.3500	1.7710	2.1600	2.6500	3.0120	4.2210
14	1.3450	1.7610	2.1450	2.6240	2.9770	4.1400
15	1.3410	1.7530	2.1310	2.6020	2.9470	4.0730