MASTER OF ARTS EXAMINATION, 2024

(1st Year, 2nd Semester)

EDUCATION

[METHODOLOGY OF EDUCATIONAL RESEARCH AND EDUCATIONAL STATISTICS - II]

Time : Two Hours Full Marks : 30

1. Answer any ***one*** of the following : 12×1=12

   a) An achievement test was administered to a randomly selected sample of 18 students from section A and 18 students from section B of class X of a school. The scores are given below. Based on the given information, **Identify the dependent and independent variable, formulate a null hypothesis,** and **test (at 0.05 level of significance)** whether the mean achievement of the two groups differ significantly or not. [Table attached] 12

Section A	15	16	15	12	13	17	18	20	15	26	24	25	26	16	13	14	17	18
Section B	18	20	22	23	16	18	16	15	12	14	17	18	22	22	23	18	16	13

   b) An educational researcher wanted to compare the academic achievement of HS-level students of two different schools in Kolkata. For this purpose, the researcher collected the percentage of marks in their class-XII final examination, which has been presented in the below table. Based on the given information, **identify the dependent and independent variable, formulate a null hypothesis,** and **test (at 0.05 level of significance)** whether the two groups of students represent the same population or not. [Table attached] 12

School-A	60	70	56	50	64	76	72	80
School-B	56	44	72	78	64	50	44	36

2. Answer any ***two*** in about 200 words : 6×2=12

   a) Briefly discuss the characteristics of different measurement scales. 6

   b) Write a note on common unethical practices in conducting educational research. 6

   c) Prepare a flow chart on the steps of testing statistical hypotheses. 6

   d) Find out the Pearson's coefficient of correlation between the two sets of scores given below table, and comment on the results. 6

Set-1	62	45	66	50	64	62	72	80
Set-2	56	44	72	56	64	50	67	78

3. Answer ***any three*** in about 60 words each: 2×3=6

   a) Which one is the most reliable measure of central tendency? 2

   b) What is 'Type-I error' in hypothesis testing? 2

   c) What is meant by data triangulation? 2

   d) How regression is different from correlation? 2

   e) Mention the different types of rating scales. 2

Table C Critical Values of t

Degrees of freedom	Probability P 0.10	0.05	0.02	0.01
1	$t = 6.34$	$t = 12.71$	$t = 31.82$	$t = 63.66$
2	2.92	4.30	6.96	9.92
3	2.35	3.18	4.54	5.84
4	2.13	2.78	3.75	4.60
5	2.02	2.57	3.36	4.03
6	1.94	2.45	3.14	3.71
7	1.90	2.36	3.00	3.50
8	1.86	2.31	2.90	3.36
9	1.83	2.26	2.82	3.25
10	1.81	2.23	2.76	3.17
11	1.80	2.20	2.72	3.11
12	1.78	2.18	2.68	3.06
13	1.77	2.16	2.65	3.01
14	1.76	2.14	2.62	2.98
15	1.75	2.13	2.60	2.95
16	1.75	2.12	2.58	2.92
17	1.74	2.11	2.57	2.90
18	1.73	2.10	2.55	2.88
19	1.73	2.09	2.54	2.86
20	1.72	2.09	2.53	2.84
21	1.72	2.08	2.52	2.83
22	1.72	2.07	2.51	2.82
23	1.71	2.07	2.50	2.81
24	1.71	2.06	2.49	2.80
25	1.71	2.06	2.48	2.79
26	1.71	2.06	2.48	2.78
27	1.70	2.05	2.47	2.77
28	1.70	2.05	2.47	2.76
29	1.70	2.04	2.46	2.76
30	1.70	2.04	2.46	2.75
35	1.69	2.03	2.44	2.72
40	1.68	2.02	2.42	2.71
45	1.68	2.02	2.41	2.69
50	1.68	2.01	2.40	2.68
60	1.67	2.00	2.39	2.66
70	1.67	2.00	2.38	2.65
80	1.66	1.99	2.38	2.64
90	1.66	1.99	2.37	2.63
100	1.66	1.98	2.36	2.63
125	1.66	1.98	2.36	2.62
150	1.66	1.98	2.35	2.61
200	1.65	1.97	2.35	2.60
300	1.65	1.97	2.34	2.59
400	1.65	1.97	2.34	2.59
500	1.65	1.96	2.33	2.59
1000	1.65	1.96	2.33	2.58
∞	1.65	1.96	2.33	2.58

Table M Probabilities Associated with Values as Small as Observed Values of U in the Mann-Whitney Test* (*cont.*)

(f) $N_L = 8$

N_S / U	1	2	3	4	5	6	7	8	t	*Normal*
0	.111	.022	.006	.002	.001	.000	.000	.000	3.308	.001
1	.222	.044	.012	.004	.002	.001	.000	.000	3.203	.001
2	.333	.089	.024	.008	.003	.001	.001	.000	3.098	.001
3	.444	.133	.042	.014	.005	.002	.001	.001	2.993	.001
4	.556	.200	.067	.024	.009	.004	.002	.001	2.888	.002
5		.267	.097	.036	.015	.006	.003	.001	2.783	.003
6		.356	.139	.055	.023	.010	.005	.002	2.678	.004
7		.444	.188	.077	.033	.015	.007	.003	2.573	.005
8		.556	.248	.107	.047	.021	.010	.005	2.468	.007
9			.315	.141	.064	.030	.014	.007	2.363	.009
10			.387	.184	.085	.041	.020	.010	2.258	.012
11			.461	.230	.111	.054	.027	.014	2.153	.016
12			.539	.285	.142	.071	.036	.019	2.048	.020
13				.341	.177	.091	.047	.025	1.943	.026
14				.404	.217	.114	.060	.032	1.838	.033
15				.467	.262	.141	.076	.041	1.733	.041
16				.533	.311	.172	.095	.052	1.628	.052
17					.362	.207	.116	.065	1.523	.064
18					.416	.245	.140	.080	1.418	.078
19					.472	.286	.168	.097	1.313	.094
20					.528	.331	.198	.117	1.208	.113
21						.377	.232	.139	1.102	.135
22						.426	.268	.164	.998	.159
23						.475	.306	.191	.893	.185
24						.525	.347	.221	.788	.215
25							.389	.253	.683	.247
26							.433	.287	.578	.282
27							.478	.323	.473	.318
28							.522	.360	.368	.356
29								.399	.263	.396
30								.439	.158	.437
31								.480	.052	.481
32								.520		

*Adapted from Mann, H.B., and Whitney, D.R. 1947. On a test of whether one of two random variables is stochastically larger than the other. *Ann. Math. Statist.*, 18, 52–54.