



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**FACULTY OF NATURAL RESOURCES AND SPATIAL SCIENCES**

**DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES SCIENCES**

QUALIFICATION:	Bachelor of Agriculture		
QUALIFICATION	07BAGR		
COURSE CODE:	RME620S	COURSE NAME:	Basic Research Methodology
NQF LEVEL:	6	NQF CREDITS:	10
SESSION:	January 2019	PAPER:	Theory
DURATION:	3 Hours	MARKS:	100

**SECOND OPPORTUNITY / SUPPLEMENTARY EXAMINATION QUESTION PAPER**

EXAMINER(S):	Mr. Brian J. Mhango
MODERATOR:	Dr T. Nzuma

**INSTRUCTIONS**

1. Write clearly and legibly.
2. **Answer ALL the Questions**
3. Number the answers clearly

**PERMISSIBLE MATERIALS**

1. Calculators may be used

**THIS QUESTION PAPER CONSISTS OF 6 PAGES (Including this Front Page)**

ANSWER ALL QUESTIONS IN THIS SECTION

[100 MARKS]

**QUESTION 1**

With examples, explain how an APA reference list can be compiled from Web articles.

[10]

**QUESTION 2**

Briefly, explain the meaning of a peer-reviewed article and the processes followed in peer-reviewing articles.

[10]

**QUESTION 3**

According to the APA referencing style, explain in-text citations highlighting capitalization, quotes, and italics/underlining, provide an example of how a short quotation would be done.

[20]

**QUESTION 4**

- a) What is the name of a diagram or a plot that is used to detect a relationship between two quantitative variables? (1)
- b) Provide a sketch of your diagram named in (a) above (1)
- c) A land use Planner conducted a study to determine whether there is a linear relationship between donations to conservancies (in thousands of dollars) and percent of income donated to nature conservation charities. The data are listed in the table below. Display the data in a scatterplot and determine the type of correlation. Donations to conservancies (in 1000s),  $X = 42, 48, 50, 59, 65, 7$ , and Donating Percent,  $Y = 9, 10, 8, 5, 6, 3$ . (8)

[10]

**QUESTION 5**

The data below is ungrouped raw data of average rainfall (mm) frequencies over the last 73 years

Raw Data	Frequency	Raw Data	Frequency
10	1	75	6
15	2	78	1
28	1	80	3
30	2	82	1
33	1	85	3
40	1	90	4
45	5	95	3
46	1	99	1
50	3	100	1
52	1	105	1
55	3	115	1
58	1	120	2
60	2	125	2
65	8	137	1
68	2	140	1
70	5	145	1
73	1	200	1

- a) Draw a stem and leaf plot of data above the 50th percentile (5)
- b) Draw a box-whisker plot of the rainfall over the last 73 years (5)
- c) Assuming that the rainfall is normally distributed what is the probability of picking a year with rainfall below 50<sup>th</sup> percentile of the average rainfall recorded over the past 73 years? (5)
- d) How many years had average rainfall of less than 85.5mm? (15)

[30]

**QUESTION 6**

In the garden pea, yellow cotyledon colour is dominant to green, and inflated pod shape is dominant to the constricted form. Considering both of these traits jointly in self-fertilized dihybrids, the progeny appeared in the following numbers:

- 193 green, inflated
- 184 yellow constricted
- 556 yellow, inflated
- 61 green, constricted

Genes are said to assort independently if they follow the 9:3:3:1 Rule from a dihybrid cross. Based on these experimental observations answer the following questions:

- a) State the appropriate hypotheses (4)
- b) Do these genes assort independently? (16)

[20]

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## APPENDIX 1: STATISTICAL FORMULAS

$$\bar{x} = \frac{\sum_{i=1}^n x_i}{n}$$

$$s^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}$$

$$i = \left( \frac{p}{100} \right) n$$

$$z = \frac{X - \bar{X}}{S}$$

$$r = \frac{1}{n-1} \sum_{i=1}^n \left( \frac{x_i - \bar{x}}{s_x} \right) \left( \frac{y_i - \bar{y}}{s_y} \right)$$

$$\chi^2 = \sum \frac{(o - e)^2}{e}$$

## APPENDIX 2: CHI-SQUARE DISTRIBUTION TABLE

d.f.	.995	.99	.975	.95	.9	.1	.05	.025	.01
1	0.00	0.00	0.00	0.00	0.02	2.71	3.84	5.02	6.63
2	0.01	0.02	0.05	0.10	0.21	4.61	5.99	7.38	9.21
3	0.07	0.11	0.22	0.35	0.58	6.25	7.81	9.35	11.34
4	0.21	0.30	0.48	0.71	1.06	7.78	9.49	11.14	13.28
5	0.41	0.55	0.83	1.15	1.61	9.24	11.07	12.83	15.09
6	0.68	0.87	1.24	1.64	2.20	10.64	12.59	14.45	16.81
7	0.99	1.24	1.69	2.17	2.83	12.02	14.07	16.01	18.48
8	1.34	1.65	2.18	2.73	3.49	13.36	15.51	17.53	20.09
9	1.73	2.09	2.70	3.33	4.17	14.68	16.92	19.02	21.67
10	2.16	2.56	3.25	3.94	4.87	15.99	18.31	20.48	23.21
11	2.60	3.05	3.82	4.57	5.58	17.28	19.68	21.92	24.72
12	3.07	3.57	4.40	5.23	6.30	18.55	21.03	23.34	26.22
13	3.57	4.11	5.01	5.89	7.04	19.81	22.36	24.74	27.69
14	4.07	4.66	5.63	6.57	7.79	21.06	23.68	26.12	29.14
15	4.60	5.23	6.26	7.26	8.55	22.31	25.00	27.49	30.58
16	5.14	5.81	6.91	7.96	9.31	23.54	26.30	28.85	32.00
17	5.70	6.41	7.56	8.67	10.09	24.77	27.59	30.19	33.41
18	6.26	7.01	8.23	9.39	10.86	25.99	28.87	31.53	34.81
19	6.84	7.63	8.91	10.12	11.65	27.20	30.14	32.85	36.19
20	7.43	8.26	9.59	10.85	12.44	28.41	31.41	34.17	37.57
22	8.61	9.54	10.98	12.34	14.04	30.81	33.92	36.78	40.29
24	9.89	10.86	12.40	13.85	15.66	33.20	36.42	39.36	42.98
26	11.16	12.20	13.84	15.38	17.29	35.56	38.89	41.92	45.64
28	12.46	13.56	15.31	16.93	18.94	37.92	41.34	44.46	48.28
30	13.79	14.95	16.79	18.49	20.60	40.26	43.77	46.98	50.89