

UNIVERSITY

UNIVERSITY EXAMINATIONS

NJORO CAMPUS

SECOND SEMESTER 2011/2012

FOURTH YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURAL ENGINEERING AND BACHELOR OF SCIENCE IN WATER AND ENVIRONMENTAL ENGINEERING

AGEN 462: RESEARCH METHODS

STREAM: 2008 (Y4) AGEN/WEEN

TIME: 2 hours

DAY/TIME: Wednesday, 03.00 - 05.00 pm

DATE: 09/05/2012

INSTRUCTIONS:

- 1. The paper consists of FOUR (4) questions.
- 2. Answer ALL questions.
- 3. All questions carry equal marks.
- 4. Marks for each question are shown in parenthesis ()
- 5. Use clear and well-labeled diagrams/illustrations where necessary
- 6. EACH QUESTION SHOULD BE STARTED ON A NEW PAGE.

QUESTION ONE

- (a) Describe the following terminologies as used in a research process:
 - (i) Research.
 - (ii) Population.
 - (iii) Data.
 - (iv) Hypothesis.

(12 marks)

(b) Why must review of literature of a research problem be done intensively, extensively, thoroughly and with a lot of diligence? (13 marks)

QUESTION TWO

(a) Briefly discuss the various sources of literature material in a research process.

(18 marks)

- (b) A wheat flour packager is concerned that one of their machines has a mean fill per package of more than 2000 g which is the labeled net weight. While this will not raise any complaints from the customers, it could cost the company a lot of money. From past experience, the standard deviation of the package fill is about 21 g. Using $\alpha = 0.05$, determine the sample size to make $\beta \le 0.01$ when the actual mean is 2008 gm:
 - (i) For one-tailed hypothesis testing, and
 - (ii) For two-tailed testing

(7 marks)

QUESTION THREE

- (a) With the aid of a simple diagram, describe the generalized research process outlining its cyclic nature and the inter-relationship of the various stages with theory. (15 marks)
- (b) Giving examples, briefly explain the FIVE recognized sources of knowledge.

(10 marks)

QUESTION FOUR

- (a) Distinguish between the following terms as used in research:
 - (i) Conceptual research and Analytical research
 - (ii) Descriptive research and Fundamental research
 - (iii) Probability sampling and Non-probability sampling
 - (iv) Accessible population and Target population.

(8 marks)

(b) A population in a study comprised of three strata such that:

 N_1 = 8,000, N_2 = 3,000 and N_3 = 4,000 and the respective standard deviations are: σ_1 = 18, σ_2 = 25 and σ_3 = 9.

- (i) How should a sample size of 120 be optimally allocated to the three strata using disproportionate sampling design?
- (ii) If the respective costs of sampling in Kenyan shillings were $C_1 = 10,000$, $C_2 = 6,000$ and $C_3 = 9,000$, what would be the respective strata allocation?

(17 marks)

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Table 1: Statistical Tables

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1,313 1,701 2,648 2,467 2,763 1,311 1,699 2,6045 2,462 2,756	F	1415	1,703	2.052	2,473	277	N
1311 1,699 2,045 2,462 2,156	i	1,313	1.701	2,048	2,467	2,763	Ã.
	F	1111	1600	25.00	131.0	3366	8

Research Methodology An entry in the table is the proportion under the entry or the hashes between z=0 and a positive value of z. Areas for negative values for z are oranied by symmetry. Table 1: Area Under Normal Curve

376

		0.01	315	8	Ş	90'	3	Œ.	8	(6)
	(XIX)	(30.3)	(1638)	Ω.	0910	6610	(F.C.)	0720	9150	0359
	8880	80,40	.047H	1150	7850	90800	0636	5290	1111	0753
	5050	08.17	1581	0160	0948	(987	9701	1001	1303	===
	2	- 111	1155	1393	1331	1368	1405	1413	(B)7	1517
	135	165	. 1628	199	COLL	.1736	1777	1808	<u> </u>	9781
	5161	0561	SHULL	23819	305	3188	212	2157	2190	15.12
	2527	1655	1374	7357	2389	27.2	Z.Z.	2.186	1155	23,40
	CNA	3Pol 5	2642	3673	2903	77.75	2764	45.5	2823	28.52
	1881	0105	2939	73X67	21935	3023	309	3078	3108	3133
	1150	981	3212	323K	13261	3289	3315	375	3365	3389
	11.13	39) 11,	1000	X188	1506	3531	3554	3533	3500	3623
	2613	1665	3686	3708	3739	3749	E STE	3330	3810	3830
	21.81	1986	3888	3907	3925	3044	3963	SAME.	38017	5 6
	- F	1049	400F	.4082	DOUN"	41115	1614.	21:17	.4162	4137
	4192	TIKE.	4323	4236	A251	4265	4279	4782	9000	4319
	4131	\$707	1357	.4370	.4382	139:1	4400	4418	6717	77
1	1152	1011	4174	.4484	.4495	4505	4515	.4525	.4535	52.54.
	1554	75.7	457.3	.4582	1881	450	1608	31919	34625	.1633
	104	5494	.1656	1997	1795	4678	9894	.4693	4699	.4706
	4713	27.19	4775	4732	4738	474	1730	4756	.4761	1914
Di	1771	8777	.4783	4788	.4793	4798	4803	4808	.4812	11817
	134	1826	DEST.	4834	,4838	2787	2846	.4850	1584.	4857
	1981	1984	4868	4871	4875	4878	1888	1881.	1884	4890
	:893	9684	8887	4901	+ 4904	9000	6061	4911	4913	多三
	300	CYAST	4972	4925	49Z7	67.64	1661	JE172	#6 4 °	1936
	1938	Chest	19041	4943	\$76°	91617	8165	4949	1561	4952
7.6	1953	5501	9567	4957	4959	4960	1961	4962	1961	1584
r-	4965	90/15	1967	4968	(961	07.64	1161	4972	4073	1972
or.	Tilit	4075	4976	H977	1764.	87.60	4979	STORT.	4980	1931
	4981	C86F	4987	4983	7867	4984	4985	4985	4986	4986
	1001	Local	7.507	HOOM	4040	ADGO	CONOT	CROOL	DOOD	100th