

THE UNIVERSITY OF ZAMBIA

SCHOOL OF HUMANITIES AND SOCIAL SCIENCES

2014 ACADEMIC YEAR FINAL EXAMINATIONS

DEM 2414: RESEARCH AND STATISTICAL METHODS IN DEMOGRAPHY

INSTRUCTIONS:

SECTION A AND B ARE COMPULSORY. ANSWER TWO MORE QUESTIONS: ONE FROM SECTION C AND ANOTHER FROM SECTION D

TIME: THREE HOURS

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SECTION A

ANSWER ALL QUESTIONS IN THIS SECTION

THIS SECTION CARRIES 30% OF THE TOTAL MARKS.

1. Indicate which of the following are examples of primary or secondary sources of data.
  - a) Newspaper article in the Daily Nation
  - b) Census data from the CSO
  - c) Data collected in DEM 2414
  - d) An article in a demographic journal
  - e) Original data collected from the field by a researcher
  
2. Indicate what is wrong with the hypotheses below:
  - a) There is a relationship between education and job success
  - b) The more religious an individual is, the greater the likelihood of going to heaven
  - c) The higher an individual's level of education, the better the chances of job success
  - d) Female students are less likely to succeed in more demanding jobs
  - e) There is a relationship between social class and performance in examinations
  
3. Indicate which of the following statements refer to popular modes of knowledge or characteristics of the scientific method:
  - a) Separation of values and prejudices from influencing the researcher's judgment
  - b) Believing that all valid knowledge resides in the divine deity
  - c) Basing research on observations and experiences
  - d) Reducing data into a more ordered form using analytical tools such as statistics
  - e) Believing something will happen on the basis of a premonition
  - f) Coming to a conclusion on the basis of widely held opinions
  - g) Basing one's judgment on the advice of a witchdoctor
  - h) Using reasoning and logic to come to a conclusion

- i) Applying the findings of research to the whole population and different socioeconomic contexts
  - j) Making a judgment on the basis of what is traditionally taken to constitute the truth
4. Which of the following situations are indicative of disproportionate or proportionate stratified random sampling, systematic sampling, simple random sampling or cluster sampling or none?
- a) A researcher selects students in his class for a research on gossiping after which he generalizes the findings
  - b) A researcher selects every tenth student after having selected the first one randomly from the first interval
  - c) A researcher selects ten hostels randomly and then interviews all the students from these hostels
  - d) A researcher selects 100 students randomly from a population 4,500 students and then gives them self-administered questionnaires
  - e) A researcher subdivides the student population into male and female categories and then selects equal numbers of male and female students in a population where the ratio of males to females is four to one.
5. Supposing you are given two concepts, sociability and racial/ethnic prejudice, indicate which of the following are conceptual or operational definitions:
- a) **Prejudice**
    - i. Discriminatory tendencies
    - ii. Do you like blacks?
    - iii. Cultural hostility
    - iv. Xenophobia
    - v. Dislikes other tribes and races
  - b) **Sociability**
    - i. Gregariousness
    - ii. Likes attending parties
    - iii. Affability
    - iv. Likes making friends
    - v. Anti-social behavior
6. Indicate the scales of measurement for the variables below:
- a) The religious affiliation of UNZA students
  - b) The test scores of DEM 2414 students as a measure of statistical ability
  - c) UNZA academic staff classified in terms of their favourite toothpaste
  - d) Classification of students at CBU by social class
  - e) The ranking of workers in in the private, parastatal, and public sectors in terms of an occupational prestige scale
  - f) The amount of time spent doing the DEM 2414 examination
  - g) The savings account at ZANACO in an overdraft situation

7. Identify the main variables in the passage below, and then answer the questions that immediately follow.

A sociologist studying the process of social mobility finds that higher socioeconomic status of one's parents translates into higher earnings in late life. When the variable, educational attainment, is introduced into the equation however, he finds that the correlation between earnings and parents' socioeconomic status nearly disappears. Which in this situation is:

- a) Independent variable?
- b) Intervening variable?
- c) Dependent variable?
- d) Antecedent variable?
- e) Control variable?
- f) Confounding variable?

8. Match the statements given below with the four aims of the social sciences – description, explanation, etc. *prediction, analysis*

- a) A researcher studying AIDS concludes that the more promiscuous one's behavior, the greater the probability of contracting AIDS
- b) The same researcher states that that due to the unchanging sexual behavior of Zambians, he foresees in an increase in the number of aids victims in the next 10 years.
- c) At the start of his analysis, the researcher finds that 65% of AIDS cases are among prostitutes and 35 percent among the rest of the population
- d) A researcher learns about the problems
- e) A social scientist investigating the increasing levels of recidivism among juvenile delinquents concludes, after an exhaustive study, that this is due breakdown of the family in Zambia.
- f) A social scientist gives a breakdown of the percentage of juvenile delinquents from broken families, their sex and their average age.
- g) A social scientist joins a group of juvenile delinquents at Inter-City Bus Terminal and tries to learn their way of life.
- h) After his study of juvenile delinquents, the social scientist suggest, on the basis of increasing divorce rates among Zambian couples that in ten years' time one out of every ten youths will be a juvenile delinquent.

9. Indicate which of the following statements best describes a paradigm, theory, or model:

- a) The rules and procedures that govern the conduct of scientific research
- b) A mathematical representation of patterns of social interaction
- c) A relationship between the subject inquiry and a set of interrelated factors
- d) The positivist or phenomenological perspective in research
- e) A purported attempt to explain the relationship between two variables, X and Y.
- f) A computer simulation of the relationship between demographic and economic variables used to predict changes in GDP.

10. In which of the following nonrandom sampling techniques does the researcher ask the research participants to identify other potential participants?

- a) Snowball
- b) Convenience
- c) Purposive
- d) Quota

**SECTION B**

**ANSWER ALL QUESTIONS IN THIS SECTION  
THIS SECTION CARRIES 30% OF THE TOTAL MARKS.**

1. Briefly respond to the following questions on probability.

- a) What are the three axioms of probability
- b) What is a mutually exclusive event
- c) What is an independent event?
- d) What is a dependent event?

$$0 \leq P(E) \leq 1$$

2. Indicate which measure of central tendency – mean, median, and mode- would be appropriate in the situations below:

- a) In trying to determine who a typical Zambian is.
- b) In trying to estimate the total income of all UNZA employees on the basis of the sample of them.
- c) In trying to estimate whether at least half of the students passed the DEM 2414 examination last year.

3. With what type of data and scale of measurement are the following types of graphs appropriate?

- a) Pie chart
- b) Bar chart
- c) Frequency polygon
- d) Frequency histogram

4. Given below are examination scores of 20 Physics students:

76	56
48	74
24	20
72	62
82	46
80	82
90	78

... of ...  
... when the ...  
... an ...

52	38
30	28
58	40

Use the data to compute and interpret the following measures:

- a) Mean
  - b) Median
  - c) Mode
  - d) Standard deviation
5. Against each of the statements below, indicate whether it is true or false.
- a) The standard deviation of the sampling distribution is called the standard error
  - b) An estimate of a parameter is unbiased if the mean of the sampling distribution equals the population parameter
  - c) An estimate is efficient when the standard error of the statistic of the sampling distribution is large.
  - d) A percentile is the score below which  $p\%$  of the observations are located and above which  $(100 - p)\%$  are located.
6. Use the standard normal distribution table to complete the table below:

	z - score	Proportion of the area associated with score	Proportion of the area below the score	Proportion of the area above the score
a)	-1.20			
b)	-0.80			
c)	3.07			
d)	0.60			
e)	2.60			
f)	1.65			

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**SECTION C**

**ANSWER ANY ONE QUESTION IN THIS SECTION  
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1. Answer the questions below, with examples where possible.
- a) Explain what sampling is and draw out the differences between representative and nonrepresentative sampling.

b) Define or explain the terms below, making sure you also give the formulas where required:

- i. Sampling fraction
- ii. Sampling interval
- iii. Sampling frame
- iv. Blank foreign element
- v. Incomplete frame
- vi. Parameter
- vii. Statistic

c) Discuss, in the correct sequence and with brief examples/illustrations, the stages in the sampling process.

d) Given below are data on UNZA students, you are required to do the following:

- i. Select a sample 100, the criteria of stratification being sex and social class.
- ii. Indicate the type of selection method you have used.

Social class	Sex	
	Male	Female
Low	400	200
Middle	300	500
Upper	500	100

600

800

600

1,200

800

*Simple random  
stratified  
systematic  
cluster  
multistage*

2. Demonstrate your understanding of measurement by responding to the questions below:

- a) Define and then then discuss the importance of measurement in research.
- b) Explain why knowledge of the scale of measurement is important in research.
- c) Use examples to discuss the properties of the major scales of measurement.
- d) Using the example of the relationship between socioeconomic status and contraceptive use, demonstrate the difference between conceptual definitions, operational definitions, and indicators.
- e) Using the same example in d), explain the link between hypothesis-formulation, measurement, and questionnaire construction.

3. Demonstrate your understanding of research design by responding to the questions below:

- a) Discuss, with relevant examples, what an exploratory study is.
- b) Using relevant examples to illustrate this, briefly explain the difference between an experimental and quasi-experimental design.
- c) Discuss the more salient advantages and drawbacks of experimental designs.
- d) In what way can a quasi -experimental design be said to be better than a classical experimental design

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1. A market survey carried out at Arcades Shopping Centre based on a random sample of 10 customers wants to find out if their trips to the Centre are influenced by the distance between their residence and the Centre. The data is presented in the table below:

Subjects	Trips <sup>x</sup>	Distance <sup>y</sup>
A	15	4
B	24	2
C	22	3
D	16	7
E	7	6
F	20	3
G	21	3
H	24	3
I	18	4
J	10	5

- a) Find the correlation between the number of trips and distance and interpret the result.
  - b) Find the regression of the number of trips on the distance travelled.
  - c) Interpret the constants of the regression equation.
  - d) Predict the number of trips one is likely to make, given a distance of 20 kilometers from Arcades.
  - e) Compute the coefficient of determination and interpret it.
2. A company is implementing a smoke – free workplace policy and is interested in whether smoking affects worker accidents. Since the company has complete reports on on-the-job accidents, a sample of names of workers is drawn from those who were involved in accidents during the last one year. A similar sample from among workers who had no reported accidents in the last year is also drawn. Members of both groups are interviewed to determine if each is a smoker or non – smoker and if a smoker whether the person classifies himself or herself as a heavy or moderate smoker. The results are given in the table below:

	On the job accident		Total
	Yes	No	
Smoker			
Heavy smoker	12	4	16
Moderate	9	6	15
Nonsmoker	13	22	35
Total	34	32	66

- a) What statistical test is appropriate for this situation?

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SECTION A

ANSWER ALL QUESTIONS IN THIS SECTION  
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1. Which form of reasoning is the process of drawing a specific conclusion from a set of premises?
  - a) Rationalism
  - b) Deductive reasoning
  - c) Inductive reasoning
  - d) Probabilistic
  
2. Research that is done to examine the findings of someone else using the "same variables but different people" is which of the following?
  - a) Exploration
  - b) Hypothesis
  - c) Replication
  - d) Empiricism
  
3. Which of the following is not a form of nonrandom sampling?
  - a) Snowball sampling
  - b) Convenience sampling
  - c) Quota sampling
  - d) Purposive sampling
  - e) They are all forms of nonrandom sampling
  
4. Which of the following best describes quantitative research?
  - a) The collection of nonnumeric data
  - b) Research involving the use of statistics
  - c) Research that is exploratory
  
5. A condition or characteristic that can take on different values or categories is called         
  - a) A constant