



MACHAKOS UNIVERSITY

University Examinations 2016/2017

SCHOOL OF EDUCATION

DEPARTMENT OF EDUCATION MANAGEMENT AND CURRICULUM STUDIES

FIRST YEAR SECOND SEMESTER EXAMINATION FOR DOCTOR OF
PHILOSOPHY IN EDUCATION

EPS901/EMP 923: ADVANCED EDUCATIONAL STATISTICS

DATE: 4/8/2017

TIME: 8.30-11.30 AM

INSTRUCTIONS

Answer Question One and Any Other Two Questions

QUESTION ONE

- a) By the use of relevant examples, define the following terms as applied in statistics
- i Variable (2 marks)
 - ii Theory (2 marks)
 - iii Hypothesis (2 marks)
- b) Outline any four sample selection techniques that produce a representative of the population (4 marks)
- c) The following table shows the number of visitors received by 50 residents of Maskani Home for the aged. Use the data to answer the questions below:
- | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|
| 0 | 6 | 14 | 17 | 22 | 27 | 20 | 33 | 18 | 12 |
| 24 | 2 | 18 | 34 | 30 | 17 | 19 | 12 | 19 | 15 |
| 3 | 5 | 7 | 0 | 16 | 23 | 11 | 9 | 10 | 13 |
| 14 | 8 | 16 | 18 | 20 | 12 | 32 | 16 | 8 | 10 |
| 15 | 19 | 20 | 22 | 17 | 18 | 30 | 34 | 26 | 29 |
- i Summarize these data into a frequency distribution table starting with a class of 0-4. (3 marks)

- ii Compute the Mean of the distribution (3 marks)
- iii Construct a histogram for the data (4 marks)

QUESTION TWO

- a) Explain the steps of hypotheses testing (5 marks)
- b) Explain the limitations of the Chi-Square as an inferential statistics (5 marks)
- c) At Machakos University, about half of the students live off-campus while the other half live in hostels within the campus. The academic performance based on a random sample of 500 students is shown in table 1.0 below. Determine if there is an association between the students' academic performance and the living arrangement (10 marks)

Table 1.0: Living Locality and Students' Academic Performance

Academic Performance	Locality		
	Off Campus with Room mates	Off Campus with parents	On Campus
Low	32	50	54
Moderate	56	40	24
High	70	80	76

QUESTION THREE

- a) Assume that the distribution of a college entrance exam is normal with a mean of 500 and a standard deviation of 100. For each of the scores in table 2.0, find the equivalent Z-score, the percentage of the **area above** the score and the percentage of the **area below** the score

Table 2.0: Z Score Table

<u>X_i</u>	<u>Z Score</u>	<u>% Area Above</u>	<u>% Area Below</u>
650			
400			
375			
586			

- b) Assume that the Kenyan Police force gives all applicants an entrance examination and accepts only those applicants who score in the top 15% on this test. If the mean score this

i	93	(2 marks)
ii	86	(2 marks)
iii	67	(2 marks)
iv	98	(2 marks)

- A random sample of 423 students has finished an average of 12.7 years of formal education with a standard deviation of 1.7. Is this significantly different from the national average of 12.2 years? (10 marks)
- The coach of the Machakos University basket-ball team believes that his team plays better and scores more points in front of larger crowds. The number of points scored and attendance for the games last season are as reported in Table 3.0. Do these data support the coach's argument?

Game	Points Scored	Attendance
1	54	378
2	57	350
3	59	320
4	80	478
5	82	451
6	75	250
7	73	489
8	53	451
9	67	410
10	78	215
11	67	113
12	56	250
13	85	450
14	101	489
15	99	472

(10 marks)

QUESTION FIVE

- a) Using relevant examples, explain the limitations of Analysis of Variance (ANOVA) (6 marks)
- b) Table 4.0 display the voter turn-out for the Ward, National Assembly and the Presidency in a number of polling stations during a certain general elections. Use the data to answer the (i) and (ii)

Table 4.0: Voter Turn-Out

Ward	National Assembly	Presidency
32	40	30
45	48	40
42	50	40
47	55	45
48	55	45
50	60	50
51	65	52
55	70	55
60	75	55
65	75	60

- i Does the rate of voter turn-out vary significantly by the type of election?(10 marks)
- ii Assess the results for significance (4 marks)