



MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS

2022/2023 ACADEMIC YEAR

SECOND YEAR FIRST TRIMESTER

SCHOOL OF PURE, APPLIED AND HEALTH SCIENCES

DIPLOMA IN FOOD, NUTRITION AND DIETETICS

COURSE CODE: DND 2107

COURSE TITLE: BIostatISTICS

DATE: 24/4/2023

TIME: 0830-1030 HRS

INSTRUCTIONS TO CANDIDATES

- i. Answer **ALL** Question in Section **One and two***
- ii. Answer two questions in section **Three***

This paper consists of 6 printed pages. Please turn over.

SECTION 1: MULTIPLE CHOICE QUESTIONS (20 MARKS)

1. What is the minimum sample required to estimate an estimator in research .
 - b) 100
 - c) 45
 - d) 30
 - e) 384

2. The following are advantages of simple random sampling method which one is not
 - a) The sample selected is representative
 - b) It gives every item an equal chance to participate
 - c) It is simple to use
 - d) The population is divided according to specific characteristics

3. At 99% level of confidence determine the upper and lower limit of sales for a company if the manager estimates that in a random sample of 100 out of 500 salesmen , the mean sales is shs 75000 and a standard deviation of Shs. 15000.
 - a) 75000 to 78464
 - b) 13420 to 13500
 - c) 71536 to 78464
 - d) 34640 to 35400

4. Estimate the standard error of two samples X and Y with mean = 7 and 10 respectively with standard deviations of 2 and 3 respectively. Determine the standard error of the samples.
 - a) 0.5
 - b) 0.25
 - c) 1.04
 - d) 0.76

5. In a study carried out at Narok county referral hospital where out of a sample of 800 patients, 560 were report to be female . at 95% level of confidence estimate the confidence levels within which the population proportion lies.
 - a) 0.54 to 0.64
 - b) 0.67 to 0.73
 - c) 0.60 to 0.70
 - d) 0.73 to 0.78

6. What statistical measure will you use to test the independence of statistical attributes
 - a) Regression analysis
 - b) Students t test
 - c) F test
 - d) Chi square test

7. What is the standard error value of two tailed test at a 5% level of significance
 - a) 1.96
 - b) 1.65
 - c) 2.33
 - d) 2.50

8. Which of the following is a non probability sampling method

- a) Simple random sampling
- b) Multistage sampling
- c) Purposive sampling
- d) Cluster sampling

9. The values which separate the rejection region from the acceptance region are called

.....

- a) Critical values
- b) Central limit theorem
- c) Standard error
- d) Confidence interval

10. When we accept a false hypothesis is called

- a) Type I error
- b) Type II error
- c) Standard error
- d) Mean deviation

11. A researcher noticed that the relationship between the mean weight of children and the height was represented by a regression line $y = 3.4 + 0.785x$, where x is the height. Estimate the value of y when x is 10.

- a) 11.25
- b) 8.5
- c) 19.0
- d) 4.485

12. Which one is not a measure of central tendency

- a) Mean
- b) Standard deviation
- c) Mode
- d) Median

13. Parametric tests assumes that the data under consideration fulfill normality condition and so standard statistical tests can be used.

- a) True
- b) False

14. *Test statistic*: A value, determined from sample information, used to determine whether or not to reject the null hypothesis

- a) True
- b) False

15. A statistical hypothesis is an assertion about a parameter of a population.

- a) True
- b) False

16. F test measures the mean difference of a distribution

- a) True

b) False

16. The data that assumes decimals is called discrete data

a) True

a) False

18. A variable that is being predicted or estimated is referred to as

a) Dependent variable

b) Intervening variable

C) Independent variable

D) None of the above

19. The statistic that provides a measure of the strength of association between two variables ; dependent variable and the independent is called

a) Coefficient of correlation

b) Analysis of variance

c) Students T test

d) Standard error

20. The following are estimators for measuring hypothesis test. Which one is NOT?

A. Normal distribution test

B. T-test

C. F-test

D. Mean distribution

Section 2: Answer all questions (40 marks)

1. The table shows whether or not the subjects suffered from heart disease and how their snoring habits were classified by their partners.

	Never	Occasionally Snores	Snores every night
Heart disease	50	90	120
No heart disease	70	90	80

Use a χ^2 test, at the 5% significance level, to investigate whether frequency of snoring is related to heart disease. **(10 marks)**

2. The probability of a rare disease striking a given population is 0.003. A sample of 10000 was examined. Find the expected number suffering from the disease and hence determine the variance and the standard deviation for the above problem. **(10 marks)**

3. Distinguish between the following concepts as used in hypothesis testing

a) Probability and non probability sampling **(3 marks)**

b) Nominal and ordinal data measurements **(3 marks)**

c) Null and alternative hypothesis **(2marks)**

d) Stratified and multistage sampling

(2 marks)

4. A medical survey was conducted in order to establish the proportion of the population which was infected with cancer. The results indicated that 40% of the population were suffering from the disease. A sample of 6 people was later taken and examined for the disease. Find the probability that the following outcomes were observed .

- a) Only one person had the disease
- b) Exactly two people had the disease
- c) At most two people had the disease

(10 marks)

Section C : Answer any two questions 40 marks

1. a.) In a certain country, the Bureau of Statistics has Census records indicating that 63.9% of the population is married, 7.7% widowed, 6.9% divorced (and not re-married), and 21.5% single (never been married). A sample of 500 adults from the one province showed that 310 were married, 40 widowed, 30 divorced, and 120 single. At the 95% confidence level can we conclude that the this province is different from the rest of the country? (10 marks)

b.) A sample of 200 people where a particular devise was selected of these 100 were given a drug and the others were not given any drug. The results are as follows.

	Drug	No drug	Total
Cured	65	55	120
Not cured	35	45	80
Total	100	100	200

Test whether the drug will be effective or not, at 5% level of significance.

(10 marks)

2.a)The following data gives the height in months of a child and the corresponding weight in Kg

Height (x)	15	17	19	21	23	25	27	29	31	33	35
Weight (y)	13	21	21	24	23	25	22	24	32	31	35

Calculate the regression line ($y = a + bx$) and use it to estimate the value of Y if X is 63

(10 marks)

$$[\text{intercept } a = \frac{\sum y - b \sum x}{n} ; \text{Slope } b = \frac{n \sum xy - \sum x \sum y}{n \sum x^2 - (\sum x)^2}]$$

b) In a Nutrition competition 2 assessors were asked to rank the 10 contestants using the professional assessment skills on their response to new food supplement. The results obtained were given as shown in the table below

Contestants	A	B	C	D	E	F	G	H
1 st assessor	61	14	32	70	81	28	46	51
2 nd assessor	54	33	45	61	76	19	80	79

Hint. $r = 1 - \frac{6 \sum d^2}{n(n^2 - 1)}$

REQUIRED

Calculate the rank correlation coefficient and hence comment briefly on the value obtained

(10 Marks)

3. From the data given compute the following .

Retirement benefits £ '000	No of retirees (f)
20 - 29	50
30 - 39	69
40 - 49	70
50 - 59	90
60 - 69	52
70 - 79	40
80 - 89	11

- i. Mean
- ii. mode
- iii. median
- iv. Standard deviation and
- v. Coefficient of variation

(20 marks)

//END //