UNIVERSITY OF SWAZILAND

RE-SIT/ SUPPLEMENTARY EXAMINATION

(Total Marks: 100)

PROGRAMME:	:	B.Sc. ABE YEAR 2
	:	B.Sc. AG. ECON. & AGBMGT YEAR 2
	:	B.Sc. AG. EDUCATION YEAR 2
	:	B.Sc. AG. EXTENSION YEAR 2
	:	B.Sc. AGRON. YEAR 2
	:	B.Sc. ANI. SCI. YEAR 2
	:	B. Sc. ANI. SCI. (DAIRY) YEAR 2
	:	B.Sc. COS YEAR 2
	:	B.Sc. COS. ED. YEAR 2
	:	B.Sc. FSNT YEAR 2
	:	B.Sc. HORT. YEAR 2
	:	B.Sc. TADM YEAR 2

PAPER   :   **AEM 202**

TITLE OF PAPER   :   **ELEMENTARY STATISTICS**

TIME ALLOWED   :   **TWO (02) Hrs.**

INSTRUCTIONS

1. ANSWER <u>ALL</u> QUESTIONS IN <u>ALL</u> SECTIONS (A, B, C & D)

2. QUESTIONS CARRY MARKS AS INDICATED IN THIS PAPER.
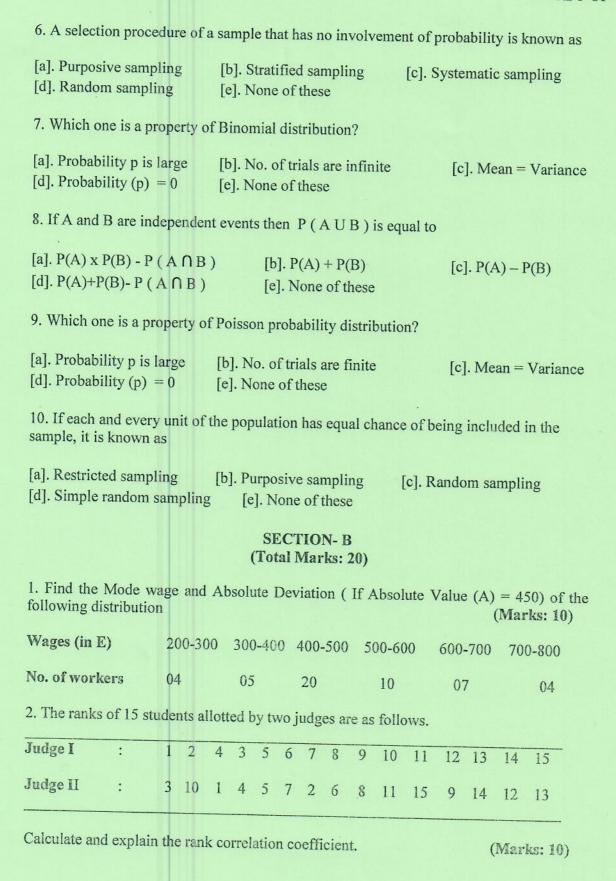
3. USE ANSWER SHEET FOR <u>ALL</u> QUESTIONS.

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SECTION – A
(Marks: 25)

I. Fill in the blanks (Only write the answers)   **(Total Marks: 05, 01 mark each)**

a. The strength of 7 colleges in a city are 1185, 1745, 1548, 1935, 1585, 2870, 2015, hence the median strength is ....

b. Fill the correct missing values, Mode = (------- x Mean + ------ Median)

c. .... is/are affected by extreme observations in measures of central tendency.

d. The most suitable measure of central tendency is ....

e. In a normal distribution the Mean, Median and Mode are ....

II. Select and Write the correct answer   **(Total Marks: 20, 02 marks each)**

1. Which statistic is/are not much affected by extreme values?

[a] Mode   [b] Median   [c] Mean   [d] St. Deviation   [e] a & b
[f] c & d   [g] None of these

2. If the mean of ten values is 70 and the nine of the values are 58, 72, 79, 56, 45, 96, 88, 75 and 66 then the tenth value will be

[a] 70   [b] 75   [c] 65   [d] 80   [e] None of these

3. Given the following nine observations 5, 6, 10, 9, 7, 8, 6, 6 and 8, hence what is the 6 in the observations?

[a] Mean   [b] Variance   [c] Mode   [d] Range [ ]   [e] None of these

4. The sum of squares of deviations is the least when measured from

[a] Median   [b] Mean   [c] Mode   [d] Zero   [e] One   [f] None of these

5. The coefficient of correlation will be zero when

[a] X is increasing, Y is decreasing   [b] Both X and Y are increasing
[c] Both X and Y is decreasing   [d] No change in X and Y   [e] None of these

6. A selection procedure of a sample that has no involvement of probability is known as

[a]. Purposive sampling   [b]. Stratified sampling   [c]. Systematic sampling
[d]. Random sampling   [e]. None of these

7. Which one is a property of Binomial distribution?

[a]. Probability p is large   [b]. No. of trials are infinite   [c]. Mean = Variance
[d]. Probability (p) = 0   [e]. None of these

8. If A and B are independent events then P (A U B) is equal to

[a]. P(A) x P(B) - P (A $\cap$ B)   [b]. P(A) + P(B)   [c]. P(A) – P(B)
[d]. P(A)+P(B)- P (A $\cap$ B)   [e]. None of these

9. Which one is a property of Poisson probability distribution?

[a]. Probability p is large   [b]. No. of trials are finite   [c]. Mean = Variance
[d]. Probability (p) = 0   [e]. None of these

10. If each and every unit of the population has equal chance of being included in the sample, it is known as

[a]. Restricted sampling   [b]. Purposive sampling   [c]. Random sampling
[d]. Simple random sampling   [e]. None of these

SECTION- B
(Total Marks: 20)

1. Find the Mode wage and Absolute Deviation (If Absolute Value (A) = 450) of the following distribution   (Marks: 10)

Wages (in E)	200-300	300-400	400-500	500-600	600-700	700-800
No. of workers	04	05	20	10	07	04

2. The ranks of 15 students allotted by two judges are as follows.

Judge I	:	1	2	4	3	5	6	7	8	9	10	11	12	13	14	15
Judge II	:	3	10	1	4	5	7	2	6	8	11	15	9	14	12	13

Calculate and explain the rank correlation coefficient.   (Marks: 10)

SECTION- C
(Total Marks: 35)

1. Two balls are drawn from a bag that contains 5 red and 7 white balls, find the probability that both the balls will be white. **(Marks: 05)**

2. A committee of 6 members is to be selected from a group of 5 men and 6 women. If the selection is made randomly, find the chance that there are 3 men and 3 women in the committee. **(Marks: 10)**

3. Samples of two types of electric light bulbs were tested for length of life and following data were obtained. **(Marks: 05)**

	Sample Size.	Sample Mean	Sample Standard deviation
Type I	8	1234 Hrs.	36 Hrs.
Type II	8	1186 Hrs.	29 hrs.

Is the difference in the means sufficient to warrant that type I is superior to type II regarding the length of life of the bulbs?

4. Two kinds of fertilizer were applied to 20 plots of equal size; other conditions are the same. The yields (in quintals) are given below **(Marks: 15)**

Fertilizer-A	19	22	18	20	21	20	20	23	20	17
Fertilizer-B	20	19	21	17	20	18	17	23	16	19

Examine the significance of the difference between the mean yields due to the application of different kind of fertilizer. ($t_{tab.,05\%} = 2.086$ and $t_{tab.,01\%} = 2.845$)

SECTION- D
(Total Marks: 20)

a. Match and Write the following   (05 marks total, 01 mark each)

1. Mean Deviation   [a]   3 Median - 2 Mean
2. Poisson Distribution   [b] $\Sigma [(O_i - E_i)^2 / E_i]$
3. Mode   [c] $[\Sigma (x - \mu)^2] / n$
4. Variance   [d] $e^{-\lambda} \lambda^x / x !$
5. Chi-Square Test   [e] $[\Sigma |x - \mu|] / n$

b. Write in short answers   (Total Marks: 15, 05 marks each)

(i) Describe the Binomial Distribution
(ii) Explain the maximum likelihood estimator.
(iii) Describe the Systematic Random Sampling.