



THE UNIVERSITY OF THE WEST INDIES

Semester I Semester II Supplemental/Summer School

Examinations of December /April/May /July 2018

Originating Campus: Cave Hill Mona St. Augustine

Course Code and Title: **MGMT6015 – BASIC STATISTICS**

Date:

Time:

Duration: **3 Hours**

Paper No:

Materials required:

Answer booklet: Normal Special Not required

Calculator: Programmable Non Programmable

(where applicable)

Multiple Choice answer sheets: numerical alphabetical 1-20 1-100

Auxiliary/Other material(s) – Please specify:

Candidates are permitted to bring the following items to their desks:

Instructions to Candidates: This paper has 5 pages & 5 questions.

Candidates are reminded that the examiners shall take into account the proper use of the English Language in determining the mark for each response.

- **Answer ANY THREE (3) questions.**
- **All questions carry equal marks.**
- **Statistical tables & Formula sheet is attached at the end of the question paper.**
- **Candidates are allowed to use non-programmable calculators.**

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1. It is imperative that students are able to identify and understand basic statistical inferences and make references to its applicability. Please answer the following below:
- Clearly define Quantitative and Qualitative data while providing an example for each to highlight the difference. **(3 marks)**
 - Define the following terms; mean, mode, median and standard deviation. **(4 marks)**
 - With the 2018 FIFA World Cup Football finals being held in Russia, there are several contenders for the Golden Boot title. The Golden boot is an award given to the footballer who scores the most goals for the world cup tournament. The following data gives the overall scores of ten (10) randomly selected Golden boot winners in the past.

7 13 10 6 9 4 11 8 5 6

Calculate the 20% trimmed mean, mean, median, mode, and range of these data. **(6 marks)**

- The following table gives the frequency distribution of the times (in minutes) that 50 UWI students spent waiting in line at the Bursary cashiers to be served in the summer of 2017.

| Time | Number of Students |
|--------------------|--------------------|
| 0 to less than 4 | 1 |
| 4 to less than 8 | 7 |
| 8 to less than 12 | 15 |
| 12 to less than 16 | 18 |
| 16 to less than 20 | 6 |
| 20 to less than 24 | 3 |

Find the variance and standard deviation. **(7 marks)**

(Total 20 marks)

2. Researchers are tasked with implementing the best research techniques in their research in order to collect adequate data and analysis. Please answer the corresponding questions below:
- Briefly explain the meaning of a population distribution and a sampling distribution. Give an example of each. **(4 marks)**
 - List and define two (2) probability sampling techniques and two (2) non-probability sampling techniques. Explain one (1) advantage and one (1) disadvantage of using probability sampling over the non-probability. **(6 marks)**
 - Explain the difference between a sampling error and a non-sampling. **(2 marks)**
 - Identify and define three (3) types of non-sampling errors. **(3 marks)**
 - Consider the following population of six (6) numbers.

51 38 1 79 1 2

- Find the population mean. **(2 marks)**
- John Brown selected one sample of four (4) numbers from this population. The sample included the numbers 13, 8, 9 and 12. Calculate the sample mean and sampling error for this sample. **(3 marks)**

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3. A recent study was carried out to evaluate the relationship between student GPA and number of hours spent 'liming' in the Student's Guild. After collecting information on the GPA of 150 students, and the number of hours spent 'liming' in the guild each week. The data was used to establish the following regression :

$$y = a + bx + e$$

Which yields:

$$\hat{y} = 3.6 - 0.16x$$

Where y represents the GPA of students sampled, and x represents the number of hours spent liming in the Guild.

- Define the intercept in a regression equation. **(3 marks)**
- Identify and interpret the intercept in the regression equation above. **(2 marks)**
- Define the slope coefficient in a regression equation. **(2 marks)**
- Identify and interpret the slope coefficient in the equation above. **(2 marks)**
- Describe whether there is a positive or negative correlation between Student GPA and the number of hours spent liming in the Guild. **(2 marks)**
- What is the predicted GPA (y) of a student who spends 10 hours liming in the guild each week? **(4 marks)**
- The r^2 for this simple regression is 0.64. Define the r^2 coefficient in a regression equation and interpret this value. **(5 marks)**

(Total 20 marks)

4. In statistics, it is necessary to consider unknowns or the possibilities of outcomes when examining data.
- Briefly describe an impossible event and a sure event. What is the probability of the occurrence of each of these two events? **(3 marks)**
 - A statistical experiment has eight equally likely outcomes that are denoted by 1, 2, 3, 4, 5, 6, 7, and 8. Let event $A = \{2, 5, 7\}$ and event $B = \{2, 4, 8\}$.
 - Are events A and B mutually exclusive events? Explain.
 - Are events A and B independent events? Explain.
 - What are the complements of events A and B , respectively, and their probabilities?**(4 marks)**
 - Three hundred (300) athletic fans were selected from the gate entrance of the 2018 World U20 Athletics Championship, and were asked whether they thought Christopher Taylor (CT) would win the 400m finals. Based on this information, the following two-way classification table was prepared.

| | Christopher Taylor (CT) to win | |
|-----|--------------------------------|----|
| | Yes | No |
| Men | 115 | 40 |

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| | | |
|--------------|-----|----|
| Women | 100 | 45 |
|--------------|-----|----|

- i. If one person is selected at random from these 300 fans, find the probability that this person:
 - a. is a woman
 - b. believes CT will win
 - c. is a man and believes that CT will win
 - d. is a woman and does not believe that CT will win
- ii. Are the events “man” and “yes” mutually exclusive? What about the events “yes” and “no?” Why or why not?
- iii. Are the events “woman” and “yes” independent? Why or why not?
- iv. What is the probability of the intersection of events “woman” and “yes?”
- v. What is the probability of the intersection of events “no” and “man?”
- vi. What is the probability of the union of events “woman” and “yes?”
- vii. What is the probability of the union of events “no” and “man?”

(13 marks)

(Total 20 marks)

5. The following table gives the result of a quick Instagram poll where the most recent post of eight (8) persons were selected to show where the amount of friends/popularity (in hundreds) they had determined the amount of likes (in hundreds) they received.

| Popularity (# of friends in hundreds) | Likes (in hundreds) |
|--|-----------------------------|
| 4 | 10 |
| 8 | 21 |
| 2 | 4 |
| 5 | 13 |
| 3 | 6 |
| 4 | 12 |
| 6 | 14 |
| 7 | 18 |

- a. Let the amount of friends/popularity be the independent variable and amount of likes be the dependent variable. Compute SS_{xx} , SS_{yy} and SS_{xy} . **(6 marks)**
- b. Draft the linear equation by computing a and b. **(4 marks)**
- c. Identify the y-intercept and the slope of this linear equation and interpret their meaning. **(4 marks)**
- d. Calculate and explain the Linear Correlation Coefficient. **(2 marks)**
- e. Graphically illustrate this linear equation and highlight the y-intercept and the slope. **4 marks)**

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END OF PAPER

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