

Tutorial Letter 101/3/2019

Statistics Education in Intermediate and Senior Mathematics

MAE202N

Semesters 1 and 2

Department of Mathematics Education

This tutorial letter contains important information
about your module.

BARCODE

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Dear Student

1 INTRODUCTION

Dear Student

We are pleased to welcome you to this module and hope that you will find it both interesting and rewarding. We will do our best to make your study of this module successful. You will be well on your way to success if you start studying early in the semester and resolve to do the assignment(s) properly.

You will receive a number of tutorial letters during the semester. A tutorial letter is our way of communicating with you about teaching, learning and assessment.

This tutorial letter contains important information about the scheme of work, resources and assignments for this module. We urge you to read it carefully and to keep it at hand when working through the study material, preparing the assignment(s), preparing for the examination and addressing questions to your lecturers.

In this tutorial letter (101), you will find the assignments and assessment criteria as well as instructions on the preparation and submission of the assignments. It also provides all the information you need with regard to the prescribed study material and other resources and how to obtain them. Please study this information carefully and make sure that you obtain the prescribed material as soon as possible.

We have also included certain general and administrative information about this module. Please study this section of the tutorial letter carefully.

Right from the start, we would like to point out that **you must read all the tutorial letters** you receive during the semester **immediately and carefully**, as they always contain important and, sometimes, urgent information.

We hope that you will enjoy this module and wish you all the best!!

2 PURPOSE AND OUTCOMES

2.1 Purpose

The purpose of this module, Statistics Education in Intermediate and Senior Mathematics, is to:

- To enable you to develop a professional attitude towards teaching and learning of basic statistics by improving your own teaching and classroom practices.

- To help you better understand how to teach basic statistics to learners in the intermediate and senior phases within the Curriculum Assessment and Policy Statement (CAPS) framework, and to introduce you to some fresh and exciting principles to use in your current practice.
- To teach you how to link statistics to real life.
- To help you gain a better understanding of how your learners learn about basic statistics.

2.2 Outcomes

On completion of this module you should be able to:

- Apply the professional standards for teaching basic statistics.
- Teach through problem solving and modelling, design problem-solving tasks, plan, and teach in a problem-based classroom.
- Explore various ways of representing, analysing and interpreting data.
- To develop your understanding of using technology in teaching and learning of basic statistics.
- Explain the concept of basic statistics.
- Demonstrate an understanding of basic statistics concepts.
- Apply basic statistics in other learning areas.

3 LECTURER(S) AND CONTACT DETAILS

3.1 Lecturer(s)

The following contact details are provided for your convenience (The dialing code for Pretoria is 012. (For foreign students: dial +27 12))

Lecturer

Ms E.G. Makwakwa AJH van der Walt Building, Office 7-14, Unisa. 012 429 4575 (Work) (08:00 - 13:00) Email: makwaeg@unisa.ac.za

You should have your student number at hand when you contact the University by telephone.

3.2 Department

The following contact details are for the department under which this module is offered.

Department of Mathematics Education
 (College of Education)
 P O Box 392
 Unisa
 0003

3.3 University

If you need to contact the University about matters not related to the content of this module, please consult the publication *Study @ Unisa* that you received with your study material. This booklet contains information on how to contact the University (e.g. to whom you can write for different queries, important telephone and fax numbers, addresses and details of the times certain facilities are open).

Always have your student number at hand when you contact the University.

Please note that all administrative enquiries should be directed to the *Study @ Unisa*. The details are as follows:

Fax number (RSA)	012 429 4150
Fax number (international)	+27 12 429 4150
E-mail	study-info@unisa.ac.za

4 RESOURCES

4.1 Prescribed books

Your prescribed textbook for this module for this year is:

Van de Walle, JA., Karp, K.S. & Bay-Williams, J.M. (2016). *Elementary and middle school Mathematics – teaching developmentally*. 9th edition. New Jersey: Pearson Education.

You must buy the prescribed book.



Earlier editions of the prescribed book, if available, may still be used. There are no major differences between the 8th & 9th editions of the prescribed book *Elementary and middle school Mathematics – teaching developmentally* by Van de Walle et al and below is a table that indicates the correspondence between them.

Eighth Edition (2014)	Ninth Edition (2016)
Chapter 1 (p.1)	Chapter 1 (p.25)
Chapter 2 (p.13)	Chapter 2 (p.37)
Chapter 3 (p.33)	Chapter 3 (p.57)
Chapter 4 (p.53)	Chapter 4 (p.81)
Chapter 5 (p.81)	Chapter 5 (p.108)
Chapter 6 (p.99)	Chapter 6 (p.128)
Chapter 7 (p.119)	Chapter 7 (p.151)
Chapter 8 (p.135)	Chapter 8 (p.166)
Chapter 9 (p.157)	Chapter 9 (p.191)
Chapter 10 (p.181)	Chapter 10 (p.218)
Chapter 11(p.203)	Chapter 11(p.246)
Chapter 12(p.229)	Chapter 12(p.271)
Chapter 13 (p.251)	Chapter 13 (p.301)
Chapter 14 (p.275)	Chapter 14 (p.323)
Chapter 15 (p.309)	Chapter 15 (p.363)
Chapter 16 (p.335)	Chapter 16 (p.395)
Chapter 17 (p.359)	Chapter 17 (p.427)
Chapter 18 (p.379)	Chapter 18 (p.453)
Chapter 19 (p.397)	Chapter 19 (p.477)
Chapter 20 (p.425)	Chapter 20 (p.512)
Chapter 21(p.459)	Chapter 21(p.550)
Chapter 22 (p.481)	Chapter 22 (p.582)
Chapter 23 (p.501)	Chapter 23 (p.606)
Appendix: Standards for Mathematical Practice (p.521)	Appendix A (A-1)
Appendix: Standards for Teaching Mathematics (p.523)	Appendix B (A-5)
Appendix: Guide to Blackline Masters (p.525)	Appendix C (A-7)
	Appendix D (A-13)
References (537)	References (R-1)
Index (557)	Index (I-1)

Please consult the list of official booksellers and their addresses listed in *Study @ Unisa*. If you have any difficulty obtaining books from these bookshops, please contact the Prescribed Books Section at telephone 012 429 4152 or e-mail vospresc@unisa.ac.za.

4.2 Recommended books

There are no recommended books for this module. We recommend you to read widely in order to keep abreast with contemporary statistics education literature.

4.3 Electronic reserves (e-reserves)

Check the myUnisa site for this module and look under “Resources”.

If you have access to a computer that is linked to the internet, you can quickly access resources and information at the University. The myUnisa learning management system is Unisa's online campus that will help you to communicate with your lecturers, other students and administrative departments of Unisa – all through the computer and the internet.

To go to the myUnisa website, start at the main Unisa website, <http://www.unisa.ac.za>, and then click on the “Login to myUnisa” link on the right-hand side of the screen. This should take you to the myUnisa website. You can also go there directly by typing in <http://my.unisa.ac.za>.

Please consult the publication *Study @ Unisa*, which you received with your study material, for more information.

4.4 Library services and resources

The Unisa Library offers a range of information services and resources:

- for detailed Library information go to <http://www.unisa.ac.za/sites/corporate/default/Library>
- for research support and services (e.g. personal librarians and literature search services) go to <http://www.unisa.ac.za/sites/corporate/default/Library/Library-services/Research-support>

The Library has created numerous Library guides:

<http://libguides.unisa.ac.za>

Recommended guides:

- Request and download recommended material: <http://libguides.unisa.ac.za/request/request>
- Postgraduate information services: <http://libguides.unisa.ac.za/request/postgrad>
- Finding and using library resources and tools: http://libguides.unisa.ac.za/Research_skills
- Frequently asked questions about the Library: <http://libguides.unisa.ac.za/ask>
- Services to students living with disabilities: <http://libguides.unisa.ac.za/disability>

You will be required to provide your login details, namely your student number and myUnisa password, in order to access the library's online resources and services. This will enable you to:

- view or print your electronic course material
- request library material
- view and renew your library material
- use the library's e-resources

Requesting books

Students are expected to purchase their own copies of the **prescribed books** listed in Tutorial Letters 101. A limited number of copies are housed in Unisa's libraries, subject to each branch library's lending regulations. Problems experienced in obtaining copies from booksellers should be directed to the Prescribed Book section at e-mail vospresc@unisa.ac.za or telephone +27 12 429 4152.

Electronic requests

The preferred way of requesting **recommended or additional books** is **online** via the library's catalogue. Go to <http://oasis.unisa.ac.za>; or via myUnisa, go to <http://my.unisa.ac.za>> Login > Library > Library catalogue; or for mobile access (AirPAC), go to <http://oasis.unisa.ac.za/airpac>.

Postal requests

Books may also be requested by completing one library book **request card** for each book. Request cards are included in your study package. These should be mailed to:

The Head: Request Services

Department of Library Services

PO Box 392

UNISA

0003

or faxed to +27 12 429 8128.

Enquiries about requested books should be sent to bib-circ@unisa.ac.za. Please note that requests should not be sent to this e-mail address, it is for enquiries.

Telephonic enquiries can be made at +27 12 429 3133/3134; there is also an after-hour voicemail service available at these numbers.

Postal requests

Journal articles may also be requested by completing an article **request card** for each item. These should be mailed to the same address as postal requests above or faxed to +27 12 429 8128.

Enquiries about requested articles should be addressed to bib-circ@unisa.ac.za and telephonic enquiries can be made at +27 12 429 3432.

5 STUDENT SUPPORT SERVICES

The *Study @ Unisa* brochure is available on myUnisa: www.unisa.ac.za/brochures/studies

This brochure has all the tips and information you need to succeed at distance learning and, specifically, at Unisa.

6 STUDY PLAN

Use the *Study @ Unisa* brochure for general time management and planning skills

7 PRACTICAL WORK AND WORK-INTEGRATED LEARNING

This module will assist you in the planning of your relevant teaching practice lessons on mathematics in the Intermediate and Senior Phase.

8 ASSESSMENT

8.1 Assessment criteria

When assessing your assignments, we will focus on the following:

- Your understanding of the question
- Your ability to reason and accurately perform meaningful computations
- Relevance in answering the question
- Your ability to give examples that enable learners to like and understand statistical concepts
- Mistakes in calculation or reasoning, or any mathematical error, for which marks will be deducted

8.2 Assessment plan

Assignments are seen as part of the learning material for this module. As you do the assignment, study the reading texts, consult other resources, discuss the work with fellow students or tutors or do research, you are actively engaged in learning. Looking at the assessment criteria given for assignments will help you to understand what is required of you more clearly.

There are **two** (2) assignments per semester. Assignment 01 contributes 20% and assignment 02 contributes 80% to the year mark.

In some cases, additional assessment might be available on the myUnisa site for your module. For students attending tutorial sessions, tutors may also set additional tasks and give feedback in class.

The nature of the module requires that the students study and cover a wide spectrum of module related knowledge. The content specified in the module should be delivered in a developmental format. As a result knowledge development for this module is addressed in a form of assignments. As you do the assignments you will get an opportunity to engage strongly with the content. **However the lecturer will sample certain questions (items) in the assignment for marking purposes, while others will not be marked. It is only the marked section of the assignment that will be used to compute the semester mark for each student. This arrangement is meant to encourage each student to study all sections (topics) of the module as the knowledge of all these sections will be required for examination purposes.** You are therefore advised to develop your own study schedule (plan, organise yourself and manage your time properly) and begin assignments soon after you received your study material

Please note: Although students may work together when preparing assignments, each student must write and submit his or her own individual assignment. In other words, you must submit your own ideas in your own words, sometimes interspersing relevant short quotations that are properly referenced. It is unacceptable for students to submit identical assignments on the basis that they worked together. That is copying (a form of plagiarism) and none of these assignments will be marked. Furthermore, you may be penalised or subjected to disciplinary proceedings by the university.

You will receive ZERO if you copy an assignment from a fellow student or directly from a memorandum.



You will receive the correct answers automatically for multiple-choice questions. For written assignments, markers will comment constructively on your work. However, feedback on compulsory assignments will be sent to **all students registered for this module in a follow-up tutorial letter, and not only to those students who submitted the assignments. Also, feedback on compulsory assignments will be uploaded on myUnisa under official study materials.** The tutorial letter number will be 201, 202, etc.

As soon as you have received the feedback, please check your answers. The assignments and the feedback on these assignments constitute an important part of your learning and should help you to be better prepared for the next assignment and the examination.

8.3 Assignment numbers

8.3.1 General assignment numbers

Assignments are numbered consecutively per module, starting from 01. This module requires two assignments which have to be submitted for the semester. You are compelled to number the assignments as stated in the table below. Incorrect numbering will result in assignments being delayed and maybe lost in the system.

8.3.2 Unique assignment numbers

Unique assignment numbers have to be used for multiple choice as well as for written assignments. Please use the numbers given in the table below.

8.4 Assignment due dates

The following assignments are compulsory and must be submitted:

Semester 1	Unique number	Due date	Contribution to year mark	Contribution to final mark
Assignment 01 (Multiple choice)	610079	1 March 2019	20%	20%
Assignment 02 (Written)	712466	25 March 2019	80%	
Exam		May/June	100%	80%
Semester 2	Unique number	Due date		
Assignment 01 (Multiple choice)	895669	8 August 2019	20%	20%
Assignment 02 (Written)	743341	6 September 2019	80%	
Exam		October/November	100%	80%

Please Note: The higher your semester mark, the better chance you have to pass the module. To pass this module you need a minimum of 50% final mark. Spend time, and put a lot of effort into Assignments.

Please make sure that your assignments reach the university well before the time.

8.5 Submission of assignments

PLEASE NOTE: Enquiries about assignments (e.g. whether or not the University has received your assignment or the date on which an assignment was returned to you) must be directed to *Study @ Unisa*.

You might also find information on myUnisa. To go to the myUnisa website, start at the main Unisa website, <http://www.unisa.ac.za>, and then click on the 'login to myUnisa' link under the myUnisa heading on the screen. This should take you to the myUnisa website. You can also go there directly by typing in <http://my.unisa.ac.za>.

Assignments should be addressed to:

Assignment Section
PO Box 392
UNISA
0003

You may submit written assignments and assignments done on mark-reading sheets either by post or electronically via myUnisa. Assignments may not be submitted by fax or email. For detailed information and requirements as far as assignments are concerned, see the brochure Study @ Unisa, which you received with your study material.

To submit an assignment via myUnisa:

- Go to myUnisa.
- Log in with your student number and password.
- Select the module.
- Click on assignments in the menu on the left.
- Click on the assignment number you want to submit
- Follow the instructions on the screen.

IMPORTANT

When assignments are handed in electronically:

- **Write or type your name and student number on the first page of the assignment.**
Number all questions ACCURATELY.
- Use a ruler and sharp pencil to draw graphs/diagrams. You may also draw diagrams electronically.
- All assignments must be submitted in pdf format. No zip or password protected files will be accepted

8.6 The assignments

Assignments 01 and 02 are compulsory and have been added to the end of this tutorial letter. Please complete them and submit them as required.

8.7 Other assessment methods

None.

8.8 The examination

DEMARCATION OR “SCOPING” FOR EXAMINATIONS AND ASSESSMENTS

NB: In terms of a decision reached by the College, lecturers may not demarcate or “scope” specific work for examination purposes and examination questions should be based on all the work covering the notional hours of modules. Lecturers should encourage students to learn everything. In cases where competencies or skills are assessed differently during the tuition period, the various methods of assessment will be spelled out clearly by the lecturer in Tutorial Letter 201.

According to Assessment Procedure Manual 2013, paragraph 4.5.2(e), the examination memoranda (guidelines, rubrics, and so on) shall not be made available to students.

8.8.1 Examination admission

The Department of Education requires the university to prove that a student was active during the period of tuition before the student will be subsidised by the Department of Education. Senate has approved that the submission of a compulsory assignment will be used to prove activity and also that students will be admitted to the examination by submitting the assignment. Examination admission is solely dependent on submission of Assignment 01 irrespective of the mark you obtain and whether you have passed or failed. However, should you fail this assignment it will influence your year mark. Admission to the examination is administered by the Examination Section and not your lecturers. Please read study @Unisa brochure and contact the Examination Section should you have a problem with admission to the examination. Applications for rechecking or remarking should also be submitted to the Examination Section.

8.8.2 How will this work in practice?

In terms of Unisa's assessment policy, a sub-minimum of 40% in the written component(s) of the examination is required. The final mark of a student is a combination of the semester mark and the examination mark but in the case where a student does not obtain the required sub-minimum of 40% in the examination, the semester mark does not count. In such case, the final mark is the mark obtained in the examination.

8.8.3 Examination period

This module is offered in a semester period of 15 weeks. This means that if you are registered for the first semester, you will write the examination in May/June 2019 and the supplementary examination will be written in October/November 2019. If you are registered for the second semester, you will write the examination in October/November 2019 and the supplementary examination will be written in May/June 2020.

During the semester, the Examination Section will provide you with information regarding the examination in general, examination venues, examination dates and examination times.

8.8.4 Previous examination papers

Previous examination papers are available to students. We advise you, however, not to focus on old examination papers only as the content of modules and therefore examination papers changes from year to year. You may, however, accept that the type of questions that will be asked in the examination will be similar to those asked in the activities in your study guide and in the assignments.

9 FREQUENTLY ASKED QUESTIONS

The Study @ Unisa brochure contains an A-Z guide of the most questions that students ask. Please refer to this brochure for frequently asked questions.

10 SOURCES CONSULTED

None.

11 IN CLOSING

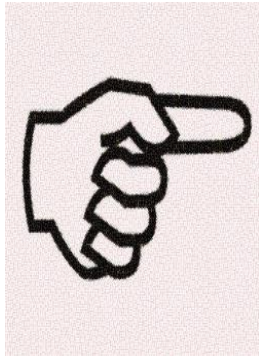
I wish you every success with your studies.

12 ADDENDUM

12.1 ADDENDUM A – ASSIGNMENTS FOR FIRST SEMESTER

NO EXTENSION WILL BE GRANTED.

Take note of this important information:



READ THE FOLLOWING SECTIONS **AGAIN** BEFORE WRITING YOUR ASSIGNMENTS:

- **Section 8.2, Paragraph 4**
- **Section 8.8**
- **Section 8.4**

12.1.1 ASSIGNMENT 01 (COMPULSORY), SEMESTER 1

Due date: 1 March 2019

Unique number: 610079

Contributes 20% to semester mark.

Assignment 01 is compulsory for **examination admission.**

INSTRUCTIONS:

- Answer the questions on the mark-reading sheet provided.
- The method for answering the questions is explained on the mark-reading sheet. Please read the instructions carefully.
- Write the unique number provided above in the space provided on the mark-reading sheet.
- Make sure that you use the correct module code.

Question 1

Which of the following is/are an example(s) of a source(s) of data?

- A. newspapers
- B. peers
- C. observation
- D. Both B and C.
- E. Both A and B.

Question 2

Which of the following is/are an example(s) of a data-collection method(s)?

- A. newspapers
- B. books
- C. observation
- D. peers
- E. None of the above.

Question 3

The Laduma soccer magazine believes that it has a 52% share of the national male readership market of male magazines. When 3 000 readers of male magazines were randomly selected and interviewed, 1 560 stated that they read Laduma regularly. What is the population of interest?

- A. the male-magazine readership
- B. all male (as opposed to female) magazine readers
- C. the 3 000 randomly selected male readers of magazines
- D. the 1 560 male readers of magazine
- E. a male

Question 4

Which of the following options are sampling methods?

- A. the questionnaire sampling method and the interview sampling method
- B. the observation sampling method and the experiment sampling method
- C. the probability sampling method and the non-probability sampling method
- D. the internet sampling method and the newspaper sampling method
- E. All of the above.

Question 5

A probability sampling method is any selection method where the sample members are selected from the target population on a purely random basis. Which one of the following is/are a probability sampling method(s)?

- A. systematic random sampling
- B. cluster random sampling
- C. convenience sampling
- D. Both A and B.
- E. Both C and D.

Question 6

Which of the following techniques yields a simple random sampling?

- A. choosing volunteers from an introductory psychology class to participate
- B. numbering all the elements of a sampling frame and then using a random number table to pick cases from the table
- C. randomly selecting schools, and then sampling everyone within the school
- D. listing the individuals by ethnic group and choosing a proportion from within each ethnic group at random
- E. None of the above.

Question 7

The process of drawing a sample from a population is known as _____.

- A. a census
- B. a survey research
- C. sampling
- D. All of the above.
- E. None of the above.

Question 8

Determining the sample interval (represented by n), randomly selecting a number between 1 and n , and including each n^{th} element in your sample, are the steps in _____.

- A. simple random sampling
- B. cluster sampling

- C. systematic sampling
- D. stratified random sampling
- E. None of the above.

Question 9

All of the following are classifications of data EXCEPT _____.

- A. primary versus secondary
- B. categorical versus numeric (or qualitative versus quantitative)
- C. nominal, ordinal, interval and ratio-scaled
- D. discrete versus continuous
- E. All of the above are classifications of data.

Question 10

A random variable is any attribute or characteristic that is being measured or observed. All the following random variables are of the *data type*: numeric, the *measurement scale*: ratio-scaled, and continuous, EXCEPT _____.

- A. the *ages* of Grade 3 learners (7,10 years; 8,6 years)
- B. the *floor area* of Edgars stores (419,2 m²; 3336,8 m²)
- C. the *mass (in kg)* of bags of books (12,8 kg; 15,9 kg)
- D. the *time taken (in minutes)* to work (28,55 minutes; 42,38 minutes)
- E. None of the above are numeric, ratio-scaled and continuous variables.

Question 11

Which of the following is/are true about a bar chart?

- A. It displays data on a categorical variable.
- B. The width of the bars is arbitrary (but constant).
- C. The categories can be displayed in order.
- D. All of the above.
- E. Both A and B.

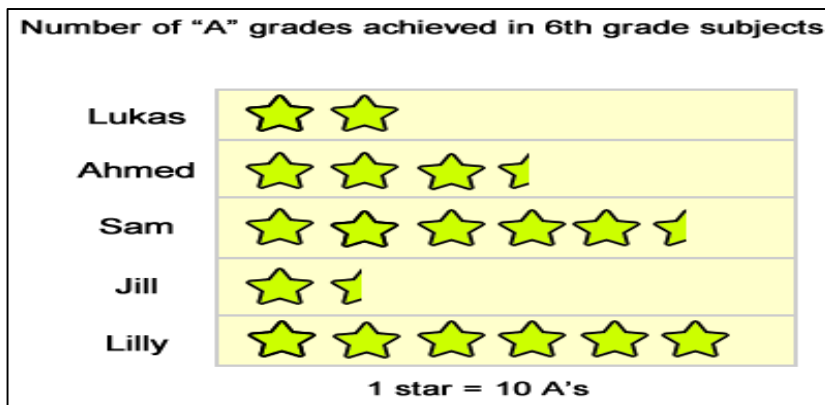
Question 12

Which of the following is/are true about a histogram?

- A. A histogram displays numeric data.
- B. The intervals must be continuous (joined and in sequence).
- C. The width of the bars is determined by the interval width.
- D. All of the above.
- E. Both B and D.

Question 13

The pictogram below shows the number of "A" grades achieved in 6th-grade subjects.




How many more A's did Lilly get than Jill?

- A. 40
- B. 35
- C. 45
- D. 20
- E. None of the above.

Question 14

Among the ninth graders, Siphon, Mpho, Vusi, Carol, Katlego, Precious and Piet are golfers. Which of the following shows how this would look on a tally chart?

- A. IIII I
- B. IIII II
- C. IIII III

D. 

E. None of the above.

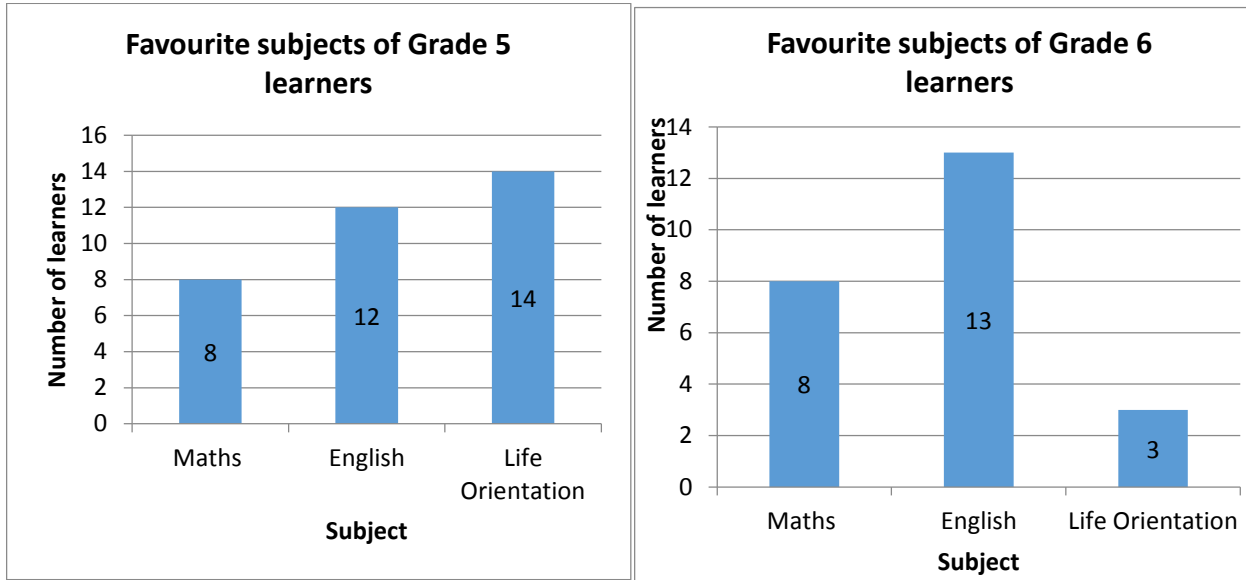
Question 15

The data: 22; 52; 24; 50; 28; 46; 28; 41; 28; 41; 29; 41; 29; 38; 30; 36; 32; 36; 34; 34 shows the scores that 20 students received in a test. Which of the following stem-and-leaf plots represents the scores that the 20 students received in their test?

A	Stems	Leaves	C	Stems	Leaves
	2	2 4 8 8 8 9 9		2	2 4 8 8 9 9 9
	3	0 2 4 4 6 6 8		3	0 2 2 4 6 6 8
	4	1 1 1 6		4	1 1 4 6
	5	0 2		5	0 2
B	Stems	Leaves	D	Stems	Leaves
	2	2 4 8 8 8 9 9		2	2 4 8 8 8 9 9
	3	0 2 2 4 6 6 8		3	0 2 4 4 6 6 8
	4	1 1 5 6		4	1 1 4 6
	5	0 2		5	0 2
E	None of the above.				

Question 16

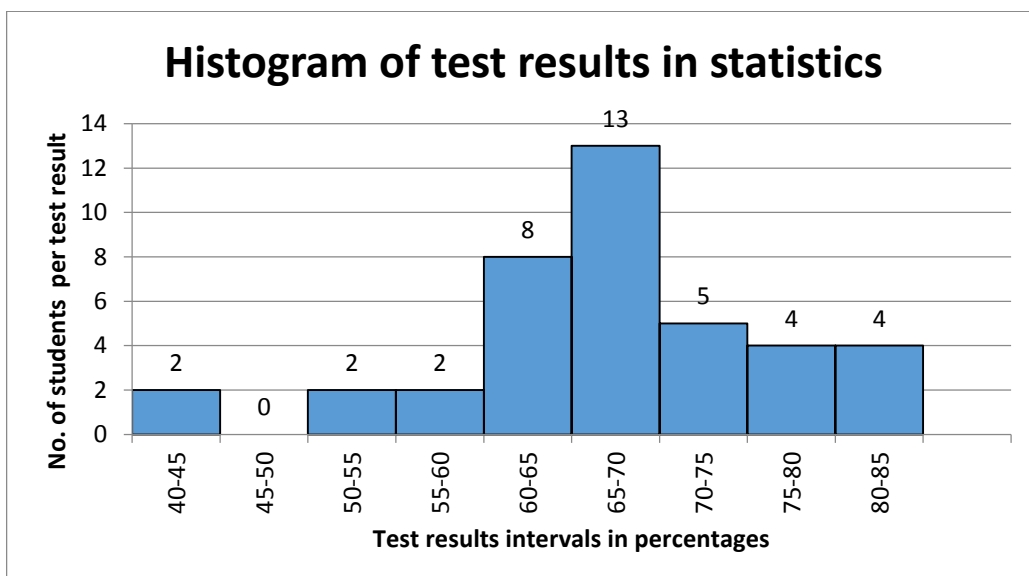
Which statement about the data in the bar graph is FALSE?



- A. More Grade 6 learners than Grade 5 learners like English.
- B. The same number of learners in both grades like Maths.
- C. More Grade 5 learners than Grade 6 learners like Life orientation.
- D. Most learners in both grades like Maths.
- E. None of the above.

Question 17

Which of the statements about the following histogram is correct?



- A. The best score in this Statistics exam was 81.
- B. Most learners scored between 60 and 65.
- C. Most learners scored less than 55 in the Statistics exam.
- D. Most learners studied for the Statistics exam.
- E. None of the above.

QUESTIONS 18 TO 27 ARE BASED ON THE FOLLOWING INFORMATION:

The Statistics Education marks (given as percentage) of 50 students in the MAE202N module were: 35; 53; 44; 79; 76; 58; 65; 54; 53; 39; 54; 44; 52; 47; 95; 77; 51; 45; 69; 72; 36; 82; 33; 50; 87; 52; 69; 70; 47; 52; 80; 90; 64; 69; 45; 38; 52; 67; 78; 92; 56; 55; 77; 45; 78; 45; 66; 72; 87; 60.

Question 18

What is the mean mark (correct to the 2nd decimal)?

- A. 59,55
- B. 61,54
- C. 61,66
- D. 59,64
- E. 61,12

Question 19

What is the median mark?

- A. 55
- B. 56
- C. 57
- D. 58
- E. 54

Question 20

What is the mode?

- A. 45
- B. 69
- C. 52
- D. 54
- E. All of the above.

Question 21

What is the range?

- A. 62
- B. 63
- C. 70
- D. 71
- E. None of the above.

Question 22

What is the lower quartile?

- A. 45
- B. 46
- C. 47
- D. 48
- E. None of the above.

Question 23

What is the upper quartile?

- A. 73
- B. 74
- C. 75
- D. 78
- E. 76

Question 24

What is the sample variance (correct to the 4th decimal)?

- A. 271,4345
- B. 273,5355
- C. 276,5763
- D. 278,1682
- E. 271,1282

Question 25

What is the standard deviation (correct to the 4th decimal)?

- A. 16,3758
- B. 16,1689
- C. 16,4660
- D. 16,3272
- E. None of the above.

Question 26

What is the interquartile range?

- A. 26
- B. 27
- C. 28
- D. 29
- E. All of the above.

Question 27

What is the semi-interquartile range?

- A. 13
- B. 13,5
- C. 14
- D. 14,5
- E. All of the above.

Question 28

An investor owns two shares which she monitors for a month. At the end of the month she records whether they went up, or down, or remained unchanged. If you let U = up, D= down, N = no change, what is the sample space for this random experiment?

- A. {D, U, N}
- B. {DD, UU, NN}
- C. {UU, UD, UN, DU, DD, DN, NU, ND, NN}
- D. Both A and B.
- E. None of the above.

Question 29

For a random experiment, all possible outcomes are called (the) _____.

- A. probability
- B. sample space
- C. numerical space
- D. Both A and B.
- E. None of the above.

Question 30

An event is _____.

- A. always less than 1
- B. measuring or observing an experimental outcome
- C. always greater than 1
- D. a collection of outcomes from an experiment
- E. None of the above.

Question 31

Probability is defined as _____.

- A. the likelihood than an event will happen
- B. the outcome of an experiment
- C. an uncertain event
- D. a number between 0 and 1, inclusive
- E. None of the above.

Question 32

Which is of the following is a correct statement about probability?

- A. Probabilities may assume negative values.
- B. Probability values range from 0 to 1, inclusive.
- C. Probabilities may be greater than 1.
- D. Probabilities are limited to one decimal place.
- E. All of the above are correct.

QUESTIONS 33 TO 35 ARE BASED ON THE FOLLOWING INFORMATION:

Consider rolling two ten-sided numbered polyhedrons (sides labelled 0–9).

Question 33

What is the probability that you will roll a 3 and a 1 (order is not important)?

A. $\frac{3}{81}$

B. $\frac{6}{81}$

C. $\frac{2}{50}$

D. $\frac{2}{100}$

E. None of the above.

Question 34

What is the probability that the sum of the outcomes will be an odd number?

A. $\frac{40}{81}$

B. $\frac{41}{81}$

C. $\frac{50}{100}$

D. $\frac{25}{100}$

E. None of the above.

Question 35

What is the probability that the sum of the outcomes will be 15?

A. $\frac{9}{81}$

B. $\frac{5}{81}$

C. $\frac{4}{100}$

D. $\frac{5}{100}$

E. None of the above.

Question 36

If both events CANNOT occur at the same time, then these two events are said to be _____.

- A. collectively exhaustive
- B. independent
- C. a joint event
- D. mutually exclusive
- E. None of the above.

Question 37

If the occurrence of event A has nothing to do with the occurrence of event B, then these two events are said to be _____.

- A. mutually exclusive
- B. independent
- C. collectively exhaustive
- D. a joint event
- E. None of the above.

Question 38

Which of the following best expresses the General Addition Rule?

- A. $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$
- B. $P(A \text{ or } B) = P(A) + P(B) + P(A \text{ and } B)$
- C. Both A and B.
- D. $P(A \text{ or } B) = P(A) + P(B)$
- E. None of the above.

Question 39

The conditional probability of event A, given that event B has occurred, is given by:

A. $\frac{P(B)}{P(B \text{ and } A)}$

B. $\frac{P(A \text{ and } B)}{P(A)}$

C. $\frac{P(A)}{P(A \text{ and } B)}$

D. $\frac{P(A \text{ and } B)}{P(B)}$

E. None of the above.

Question 40

Which of the following would fit the definition of the “statistical independence” of events A and B?

A. $P(A \text{ or } B) = P(A) + P(B)$

B. $P(A \text{ or } B) = P(A) + P(B) + P(A \text{ and } B)$

C. $P(A \cap B) = P(A) \times P(B)$

D. $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

E. None of the above.

Question 41

The probability that two events, A and B, will both occur, is given by the multiplication rule as:

A. $P(A \cap B) = P(A) \times P(B)$

B. $P(A \cap B) = P(B | A) \times P(B)$

C. $P(A \cap B) = P(A | B) \times P(B)$

D. Both B and C.

E. None of the above.

QUESTIONS 42 TO 44 ARE BASED ON THE FOLLOWING QUESTION:

Which of the following pairs of events would you expect to be independent, which mutually exclusive, and which neither?

Question 42

Being a pensioner this year and taking an international trip next year

- A. independent
- B. mutually exclusive
- C. neither
- D. Both A and B.
- E. None of the above.

Question 43

Being a member of Orlando Pirates football club and studying for a BEd

- A. independent
- B. mutually exclusive
- C. neither
- D. Both A and B.
- E. None of the above.

Question 44

Owning a dog and paying veterinary bills

- A. neither
- B. independent
- C. mutually exclusive
- D. Both A and B.
- E. None of the above.

QUESTIONS 45 TO 51 ARE BASED ON THE FOLLOWING INFORMATION:

The following table is a summary of the energy sources used for cooking. Suppose you pick a house at random from the list of South African residents.

Energy sources used for cooking

Energy source	Provinces										Total
	Eastern Cape	Free State	Gauteng	KwaZulu-Natal	Mpumalanga	Northern Cape	Limpopo	North-West	Western Cape		
Electricity	335	265	1 235	695	317	101	189	239	782	4 140	
Gas	33	21	41	53	11	12	21	31	19	242	
Paraffin	321	302	276	292	156	37	120	263	123	1 890	
Wood	527	60	50	520	146	56	627	158	44	2 188	
Coal	18	48	89	34	107	23	23	23	21	386	
Total	1 232	694	1 689	1 592	735	227	978	712	987	8 846	

Question 45

What is the probability that the household will be a coal user?

- A. $\frac{386}{8846}$
- B. $\frac{1890}{8846}$
- C. $\frac{302}{8846}$
- D. All of the above.
- E. None of the above.

Question 46

What is the probability that the household will be from the Free State?

- A. $\frac{187}{8846}$
- B. $\frac{694}{8846}$
- C. $\frac{978}{8846}$
- D. All of the above.
- E. None of the above.

Question 47

What is the probability that the household uses coal as a source of energy **given** that the household is from the Free State?

- A. $\frac{978}{1890}$
- B. $\frac{120}{978}$
- C. $\frac{48}{694}$
- D. All of the above.
- E. None of the above.

Question 48

What is the probability that the household will be from Mpumalanga **or** Gauteng?

- A. $\frac{735}{8846} + \frac{1689}{8846} = \frac{2424}{8846}$
- B. $\frac{53}{8846} + \frac{33}{8846} = \frac{86}{8846}$
- C. $\frac{292}{8846} + \frac{321}{8846} = \frac{613}{8846}$
- D. All of the above.
- E. None of the above.

Question 49

What is the probability that the household uses wood as a source of energy **or** will be from KwaZulu-Natal?

- A. $\frac{1592}{8846} + \frac{1689}{8846} - \frac{1233}{8846} = \frac{2346}{8846}$
- B. $\frac{2188}{8846} + \frac{1592}{8846} - \frac{520}{8846} = \frac{3260}{8846}$
- C. $\frac{1890}{8846} + \frac{1689}{8846} - \frac{276}{8846} = \frac{3303}{8846}$
- D. All of the above.
- E. None of the above.

Question 50

What is the probability that the household will be from the North-West **and** the Free state if two households were picked one after the other, with replacement?

- A. $\frac{1592}{8846} \times \frac{1689}{8846} = \frac{2346}{78251716}$
- B. $\frac{694}{8846} \times \frac{1689}{8846} = \frac{1172166}{78251716}$
- C. $\frac{712}{8846} \times \frac{694}{8846} = \frac{494128}{78251716}$
- D. All of the above.
- E. None of the above.

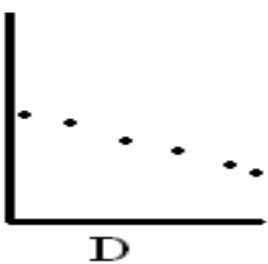
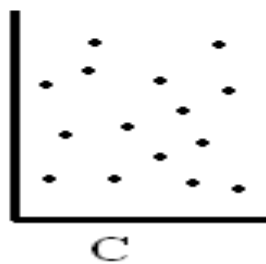
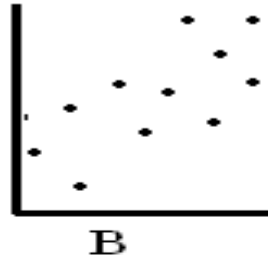
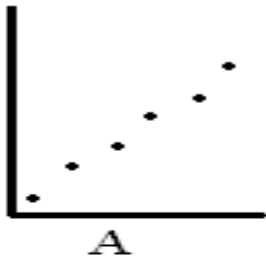
Question 51

What is the probability that the households will both be from the Western Cape, if two households were picked one after the other, without replacement?

- A. $\frac{745}{8846} \times \frac{746}{8845} = \frac{555770}{78242870}$
- B. $\frac{735}{8846} \times \frac{734}{8845} = \frac{539490}{78242870}$
- C. $\frac{987}{8846} \times \frac{986}{8845} = \frac{973182}{78242870}$
- D. All of the above.
- E. None of the above.

QUESTIONS 52 AND 53 ARE BASED ON THE FOLLOWING INFORMATION:

Graphs A to D show various patterns of relationships between x and y .

**Question 52**

Graph C shows _____.

- A. a weak linear relationship, positive
- B. a strong linear relationship, negative
- C. no linear relationship
- D. a strong linear relationship, positive
- E. a medium-strength linear relationship

Question 53

Graph D shows _____.

- A. a weak linear relationship, positive
- B. a strong linear relationship, negative
- C. no linear relationship
- D. a strong linear relationship, positive
- E. a medium-strength linear relationship

QUESTIONS 54 AND 55 ARE BASED ON THE FOLLOWING INFORMATION:

A scatter plot graphically displays all pairs of data values of the independent and dependent variables.

Question 54

The dependent variable is represented by the symbol(s) _____.

- A. y
- B. x
- C. xy
- D. Both A and B.
- E. None of the above.

Question 55

The independent variable is also called the _____.

- A. explanatory variable
- B. vertical variable
- C. response variable
- D. Both A and B.
- E. None of the above.

Total: [55]

12.1.2 ASSIGNMENT 02 (COMPULSORY) – SEMESTER 1

Due date: 25 March 2019

Unique number: 7 1 2 4 6 6

Contributes 80% to semester mark.

Answer ALL the questions.

Question 1

Write a lesson plan for Grade 9 using the outcome: “At the end of this lesson, learners should be able to represent the given data by drawing a scatter plot by hand.”

A house agent wanted to know the extent to which the selling price of a home is related to its size. The table shows the price in thousands of rands and the size in hundreds of square feet.

Price in thousands of rands	25	15	24	20	22	12	32	26
Size in hundreds of square feet	310	305	308	306	309	214	320	312

Guidelines

Describe the activity or activities that will enable the learners to discover the differences between the independent variable and the dependent variable.

Plan the “before” phase. How will you introduce or present the activity?

Plan the “during” phase. List possible hints you might give to assist the learners.

Plan the “after” phase. How will the learners report their findings? What questions will you ask to assess their understanding? (See Van de Walle, “Planning in the problem based classroom”.)

The lesson plan must be in such a format that the teacher will be able to apply it without any inputs of his or her own. For example, do not merely **say**, “I will have an assessment activity that will assess their understanding” – you must also **show** the worksheet for assessment.

[10]

Question 2

In the small village of Moloto, a **population** of homeowners were asked what their electricity bills were the previous month. The following table summarises the results:

Electricity bills (in rand) of a population of 42 households						
120	170	145	155	170	125	172
125	185	140	145	140	130	615
135	165	146	140	149	125	160
136	155	148	146	130	128	124
110	163	150	521	135	145	180
120	165	145	140	120	125	120

2.1 Calculate:

- 2.1.1 the mean (correct to 3 decimal places) and show all the steps (2)
- 2.1.2 the median (2)
- 2.1.3 the mode (2)
- 2.1.4 Is your data symmetrical, positively skewed, or negatively skewed? Explain your answer. (2)

2.2 Calculate:

- 2.2.1 the variance (correct to 3 decimal places) (3)
- 2.2.2 the standard deviation (correct to 3 decimal places) (2)
- 2.2.3 the interquartile range (3)
- 2.2.4 the semi-interquartile range (2)

2.3 Do the data contain an outlier(s)? Explain your answer. (5)

2.4 Which is the better measure of the spread of the data – the standard deviation or the interquartile range? Explain your answer. (2)

2.5 Use the class intervals $110 \leq x \leq 119$, $120 \leq x \leq 129$, $130 \leq x \leq 139$, and so on to construct a frequency table for the electricity bills (in rand) of the population of 42 households. (5)

- 2.6 Using the same frequency table in 2.5 and class boundaries of $110 \leq x \leq 119$, $120 \leq x \leq 129$, $130 \leq x \leq 139$ and so forth, construct a histogram to represent the electricity bills. (3)
- 2.7 What percentage of households spends less than R150 per month on electricity? (2)

[35]**Question 3**

Mr Qhubani sells fruit at the entrances of a university and a hospital. He wants to know whether the sales at the two locations differ. The following table is a summary of his daily sales for 31 days, at the two locations:

Daily sales of fruit at the hospital entrance (in rand)				Daily sales of fruit at the university entrance (in rand)			
125	130	145	165	145	146	145	145
167	179	158	171	136	165	136	136
178	170	168	172	125	148	125	130
170	175	170	170	147	149	148	147
175	179	178	175	154	165	156	155
175	170	130	145	165	148	149	155
179	171	165	160	149	154	155	156
176	176	165		150	150	155	

- 3.1 Draw a back-to-back **ordered** stem-and-leaf diagram of this data. (10)
- 3.2 Draw the box plot for the daily sales of fruit at the university entrance. List all the values needed for this plot. (6)

[16]

Question 4

The table below shows the price and overall quality rating for 15 different brands of bike helmets.

Helmet	Price (dollars)	Quality rating
A	35	65
B	20	61
C	30	60
D	40	55
E	50	54
F	23	47
G	30	47
H	18	43
I	40	42
J	28	41
K	20	40
L	25	32
M	30	63
N	30	63
O	40	53

- 4.1 Identify the dependent and the independent variables. (2)
- 4.2 Draw a scatter plot of the sample data. (5)
- 4.3 Do you think that there is a statistical relationship between price and quality rating? If so, describe the nature of the relationship. (3)

[10]**Question 5**

A bag contains 5 yellow balls and 7 white balls.

- 5.1 Calculate the probability that the first ball drawn at random will be yellow. (2)
- 5.2 Calculate the probability that the first ball drawn at random will be white. (2)
- 5.3 Calculate the probability that for the second draw you will get white if the first ball was white and was returned to the bag before the second draw was made. (2)
- 5.4 Calculate the probability that for the second draw you will get white if the first ball was white and was not returned to the bag. (2)

[8]

Question 6

Consider rolling two seven-sided numbered polyhedrons (sides labelled 1–7).

- 6.1 Summarise all the possible outcomes using a table format. (5)
- 6.2 Calculate the probability of tossing a 4 and a 2, order is important. (2)
- 6.3 What is the probability that the sum of the two numbers will be an even number? (2)
- 6.4 What is the probability that the sum of the two numbers will be an odd number? (2)
- 6.5 What is the probability that the sum of the two numbers will be a multiple of 4? (2)
- 6.6 What is the probability that the sum of the two numbers will be less than 8? (2)
- 6.6 What is the probability that the sum of the two numbers will be at most 8? (2)

[17]**Question 7**

The following table represents the heights, in centimetres, of a sample of 100 high school male football players in the Tshwane north district of the Gauteng province in South Africa.

Height in centimetres	Frequency	Relative frequency	cumulative relative frequency	Cumulative relative frequency %
$152.95 \leq x < 157.95$	5	$5/100 = 0.05$	0.05	
$157.95 \leq x < 162.95$	3	$3/100 = 0.03$	$0.05 + 0.03 = 0.08$	
$162.95 \leq x < 167.95$	15	$15/100 = 0.15$	a	
$167.95 \leq x < 172.95$	40	$40/100 = 0.40$	b	
$172.95 \leq x < 177.95$	17	$17/100 = 0.17$	c	
$177.95 \leq x < 182.95$	12	$12/100 = 0.12$	d	
$182.95 \leq x < 187.95$	7	$7/100 = 0.07$	e	
$187.95 \leq x < 192.95$	1	$1/100 = 0.01$	f	

- 7.1 What are the values of a , b , c , d , e and f in the table? (3)
- 7.2 Draw an OGIVE (cumulative relative frequency percentages graph) to illustrate the data in the table. (5)
- 7.3 Use the graph to estimate:
- 7.3.1 the median height (2)
- 7.3.2 the interquartile range (3)
- 7.3.3 the semi-interquartile range (1)
- 7.4 Use the table of heights of the 100 high school male football players in the Tshwane north district to fill in the blanks.
- 7.4.1 The percentage of heights that are less than 167.95 centimetres is _____. (2)
- 7.4.2 The percentage of heights that fall are from 177.95 to 182.95 centimetres is _____. (2)
- 7.4.3 The percentage of heights that are from 172.95 to 187.95 centimetres is _____. (2)
- 7.4.4 The percentage of heights that are more than 167.95 centimetres is _____. (2)
- 7.4.5 The number of players in the sample who are between 157.95 and 182.95 centimetres tall is _____. (2)

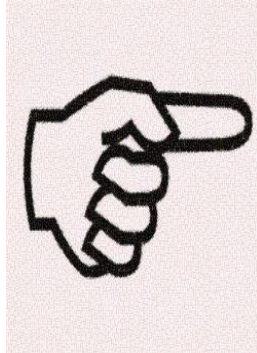
[24]

TOTAL: 120

12.2 ADDENDUM B – ASSIGNMENTS FOR SECOND SEMESTER

NO EXTENSION WILL BE GRANTED.

Take note of this important information.



READ THE FOLLOWING SECTIONS **AGAIN** BEFORE WRITING YOUR ASSIGNMENTS:

- **Section 8.2, Paragraph 4**
- **Section 8.8**
- **Section 8.4**

12.2.1 ASSIGNMENT 01 (COMPULSORY) – SEMESTER 2

Due date: 8 August 2019

Unique number: 8 9 5 6 6 9

Contributes 20% to year mark.

Assignment 01 is compulsory for **examination admission.**

INSTRUCTIONS:

- Answer the questions on the mark-reading sheet provided.
- The method for answering the questions is explained on the mark-reading sheet. Please read the instructions carefully.
- Write the unique number provided above in the space provided on the mark-reading sheet.
- Make sure that you use the correct module code.

Question 1

Which of the following is NOT an example of a source of data?

- A. newspapers
- B. peers
- C. questionnaires
- D. books
- E. None of the above is an example of a source of data.

Question 2

Which of the following is/are an example(s) of a data-collection method(s)?

- A. peers
- B. observation
- C. newspapers
- D. All of the above.
- E. None of the above.

Question 3

The Laduma soccer magazine believes that it has a 52% share of the national male readership market of male magazines. When 3 000 readers of male magazines were randomly selected and interviewed, 1 560 stated that they read Laduma regularly. What is the population of interest?

- A. all male magazine readers
- B. the 1 560 magazine readers
- C. the 3 000 randomly selected male readers of magazines
- D. All of the above.
- E. None of the above.

Question 4

Which of the following are sampling methods?

- A. the questionnaire sampling method and interview sampling method
- B. the observation sampling method and experiment sampling method
- C. the internet sampling method and newspaper sampling method
- D. the probability sampling method and non-probability sampling method

E. All of the above.

Question 5

A probability sampling method is any selection method where the sample members are selected from the target population on a purely random basis. Which one of the following is NOT a probability sampling method?

- A. simple random sampling
- B. cluster random sampling
- C. purposive sampling
- D. systematic random sampling
- E. None of the above.

Question 6

Which of the following will give a more “accurate” representation of the population from which a sample has been taken?

- A. a large sample based on the convenience sampling technique
- B. a small sample based on simple random sampling
- C. a small cluster sample
- D. a large sample based on simple random sampling
- E. None of the above.

Question 7

The process of drawing a sample from a population is known as _____.

- A. sampling
- B. a census
- C. survey research
- D. simple random sampling
- E. None of the above.

Question 8

Determining the sample interval (represented by p), randomly selecting a number between 1 and p , and including each p^{th} element in your sample are the steps in _____.

- A. simple random sampling
- B. stratified random sampling
- C. systematic sampling
- D. cluster sampling
- E. None of the above.

Question 9

All the following refer to the classification of data, EXCEPT _____.

- A. categorical versus numeric (or qualitative versus quantitative)
- B. nominal, ordinal, interval and ratio-scaled
- C. discrete versus continuous
- D. primary versus secondary
- E. All of the above refer to the classification of data.

Question 10

A random variable is any attribute or characteristic that is being measured or observed. All of the following random variables are of the *data type*: categorical; the *measurement scale*: nominal-scaled; and discrete, EXCEPT _____.

- A. the *different types of aircraft* used by SAA for domestic flights
- B. the *highest qualifications* of employees in an organisation
- C. the *types of child abuse* (physical, sexual, emotional, verbal)
- D. the *marital status* of employees
- E. All of the above are random variables of the categorical, nominal-scaled and discrete type.

Question 11

Which of the following is NOT true about a histogram?

- A. A histogram displays numeric data.
- B. The intervals must be continuous (joined and in sequence).
- C. The width of the bars is arbitrary (but constant).

- D. The width of bars is determined by the interval width.
- E. None of the above is true about a histogram.

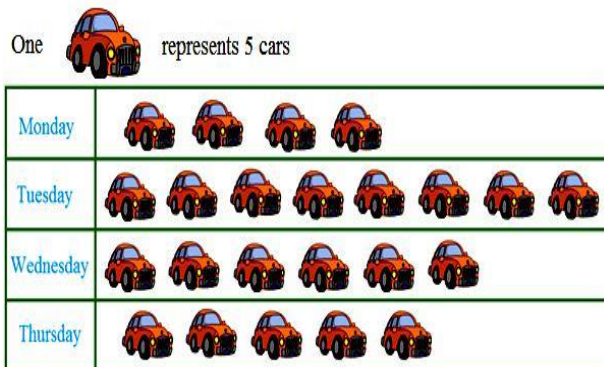
Question 12

Which of the following is NOT true about a bar chart?

- A. A bar chart displays data on a categorical variable.
- B. The width of the bars is determined by the interval width.
- C. The width of the bars is arbitrary (but constant).
- D. Categories can be displayed in order.
- E. None of the above is true about a bar chart.

Question 13

The following pictograph shows how many cars were washed at the car wash during four days of a week. How many more cars were washed on Tuesday than on Thursday?



- A. 8
- B. 3
- C. 12
- D. 15
- E. None of the above.

Question 14

Among the ninth-graders, Siphon, Mpho, Betty, Vusi, Carol, Katlego, Precious and Piet are golfers. Which of the following shows how this would look on a tally chart?

- A. IIII
 B. IIII
 C. IIII
 D. IIII
 E. None of the above.

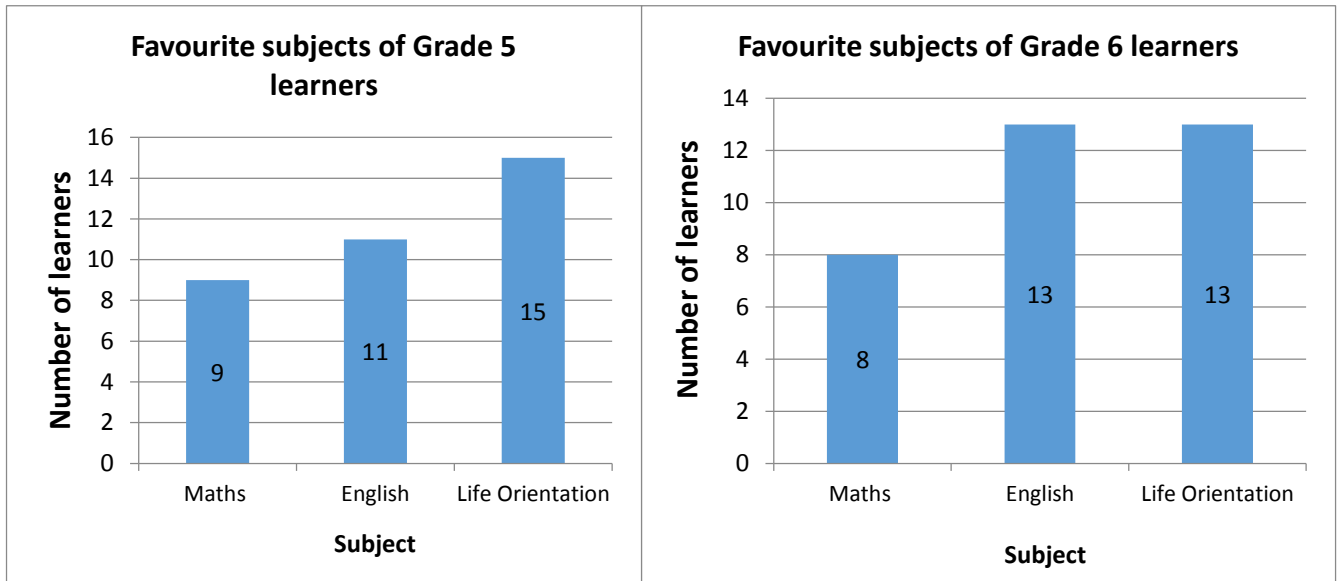
Question 15

The data: 22; 52; 24; 50; 28; 46; 28; 44; 28; 41; 28; 41; 29; 38; 30; 36; 32; 36; 32; 34 shows the scores that 20 students received in a test. Which of the following stem-and-leaf plots represents the scores that the 20 students received in their test?

A.	Stems <hr/> 2 3 4 5	Leaves <hr/> 2 4 8 8 8 8 9 0 2 2 4 6 6 8 1 1 4 6 0 2	C.	Stems <hr/> 2 3 4 5	Leaves <hr/> 2 4 8 8 9 9 9 0 2 2 4 6 6 8 1 1 4 6 0 2
B.	Stems <hr/> 2 3 4 5	Leaves <hr/> 2 4 8 8 8 9 9 0 2 2 4 6 6 8 1 1 5 6 0 2	D.	Stems <hr/> 2 3 4 5	Leaves <hr/> 2 4 8 8 8 9 9 0 2 4 4 6 6 8 1 1 4 6 0 2
E.	None of the above.				

Question 16

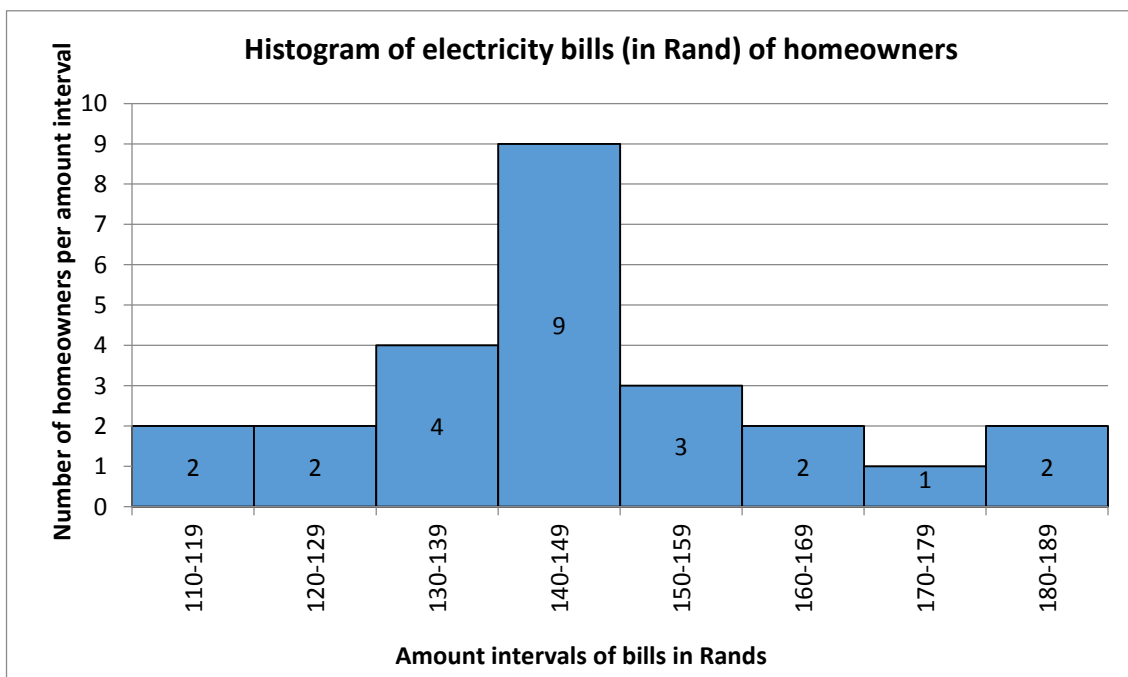
Which statement about the data in the bar graph is FALSE?



- A. More Grade 5 learners than Grade 6 learners like English.
- B. More Grade 6 learners than Grade 5 learners like Life Orientation.
- C. Most learners in both grades like Maths.
- D. More Grade 6 learners than Grade 5 learners like Maths.
- E. All of the above are false.

Question 17

Choose the correct statement about the following histogram:



- A. Most homeowners pay R180–R189 per electricity bill.
- B. Most homeowners pay less than R100 per electricity bill.
- C. Most homeowners pay R140–R149 per electricity bill.
- D. Most homeowners pay R170–R179 per electricity bill.
- E. All of the above.

QUESTIONS 18 TO 27 ARE BASED ON THE FOLLOWING INFORMATION:

The Statistics Education marks (given as percentage) of 50 students in the MAE202N module were: 32; 56; 45; 78; 77; 59; 65; 54; 54; 39; 54; 44; 52; 47; 100; 82; 51; 45; 69; 72; 36; 82; 29; 50; 87; 52; 69; 70; 47; 52; 80; 90; 64; 69; 45; 50; 45; 76; 22; 34; 45; 80; 22; 56; 57; 90; 27; 27; 78; 56.

Question 18

What is the mean mark (correct to the 2nd decimal)?

- A. 58,81
- B. 59,91
- C. 57,24
- D. 57,11
- E. None of the above.

Question 19

What is the median mark?

- A. 53
- B. 51
- C. 52
- D. 54
- E. None of the above.

Question 20

What is the mode?

- A. 45
- B. 44
- C. 47
- D. 39
- E. None of the above.

Question 21

What is the range?

- A. 70
- B. 71
- C. 72
- D. 78
- E. None of the above.

Question 22

What is the lower quartile?

- A. 45
- B. 46
- C. 47
- D. 48
- E. None of the above.

Question 23

What is the upper quartile?

- A. 70,5
- B. 71,5
- C. 70
- D. 72
- E. None of the above.

Question 24

What is the sample variance (correct to the 4th decimal)?

- A. 396,3345
- B. 369,1333
- C. 369,1245
- D. 369,3698
- E. None of the above.

Question 25

What is the sample's standard deviation (correct to the 4th decimal)?

- A. 19,9082
- B. 19,2190
- C. 19,2128
- D. 19,2126
- E. None of the above.

Question 26

What is the interquartile range?

- A. 24,5
- B. 25,5
- C. 26,5
- D. 27,5
- E. None of the above.

Question 27

What is the semi-interquartile range?

- A. 12,25
- B. 13,25
- C. 14,25
- D. 15,25
- E. None of the above.

Question 28

For a random experiment, all possible outcomes are called (the) _____.

- A. probability
- B. numerical space
- C. sample space
- D. Both A and B.
- E. None of the above.

Question 29

An event is _____.

- A. always less than 1
- B. always greater than 1
- C. a collection of outcomes from an experiment
- D. measuring or observing an experimental outcome
- E. None of the above.

Question 30

Probability is defined as _____.

- A. an uncertain event
- B. the likelihood than an event will happen
- C. the outcome of an experiment
- D. a number between 0 and 1, inclusive
- E. None of the above.

QUESTION 31

Which is of the following is a correct statement about probability?

- A. Probabilities may assume negative values.
- B. Probabilities may be greater than 1.
- C. Probabilities are limited to one decimal place.
- D. Probability values range from 0 to 1, inclusive.
- E. All of the above are correct statements about probability.

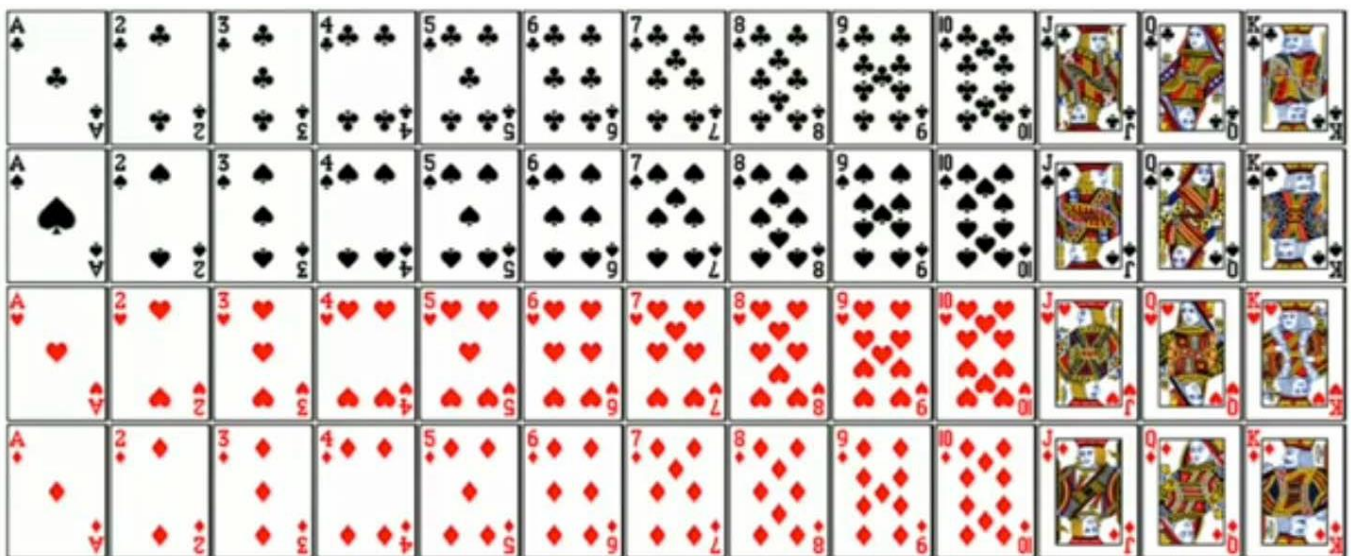
QUESTIONS 32 TO 34 ARE BASED ON THE FOLLOWING INFORMATION:

A deck of 52 cards includes 13 ranks of each of the four suits: “hearts”, “diamonds”, “spades”, and “clubs”. Within each suit, the 13 cards are labelled: Ace (A), 1, 2, 3, 4, ..., 10, Jack (J), Queen (Q), and King (K).

Let: D be the event that a randomly selected card is a diamond,

K be the event that the card is a king,

B be the event that the card has numbers from 2 to 10.

**Question 32**

$P(D)$ is:

- A. 0,27
- B. 0,30
- C. 0,25
- D. 0,28
- E. None of the above.

Question 33

P(K) is:

- A. 0,089
- B. 0,099
- C. 0,055
- D. 0,077
- E. None of the above.

Question 34

P(B) is:

- A. 0,6923
- B. 0,5920
- C. 0,4920
- D. 0,7920
- E. None of the above.

QUESTIONS 35 TO 37 ARE BASED ON THE FOLLOWING INFORMATION:

Consider rolling two ten-sided numbered polyhedrons (sides labelled 0–9).

Question 35

What is the probability that you will roll a 5 and a 7 (order is not important)?

- A. $\frac{3}{81}$
- B. $\frac{6}{81}$
- C. $\frac{2}{50}$
- D. $\frac{2}{100}$
- E. None of the above.

Question 36

What is the probability that the sum of the outcomes will be an even number?

A. $\frac{40}{81}$

B. $\frac{41}{81}$

C. $\frac{50}{100}$

D. $\frac{25}{100}$

E. None of the above.

Question 37

What is the probability that the sum of the outcomes will be 10?

A. $\frac{9}{81}$

B. $\frac{10}{81}$

C. $\frac{11}{100}$

D. $\frac{9}{100}$

E. None of the above.

Question 38

A salesperson, after calling on a client, records the outcome: sale made (SM), or no sale made (NM). Which of the following is the correct sample space if two clients are visited?

A. {SM, SM, NM, SM}

B. {SMSM, SMNM, NMSM, NMNM}

C. {NM, NM, SM, NM}

D. None of the above.

E. All of the above.

Question 39

If both events CANNOT occur at the same time, then these two events are said to be _____.

- A. mutually exclusive
- B. collectively exhaustive
- C. independent
- D. a joint event
- E. None of the above.

Question 40

If the occurrence of event A has nothing to do with the occurrence of event B, then these two events are said to be _____.

- A. mutually exclusive
- B. collectively exhaustive
- C. independent
- D. a joint event
- E. None of the above.

Question 41

Which of the following best expresses the General Addition Rule?

- A. $P(A \text{ or } B) = P(A) + P(B)$
- B. $P(A \text{ or } B) = P(A) + P(B) + P(A \text{ and } B)$
- C. $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$
- D. None of the above.
- E. All of the above.

Question 42

The conditional probability that event A, given event B, has occurred, is given by _____.

A. $\frac{P(B)}{P(B \text{ and } A)}$

B. $\frac{P(A \text{ and } B)}{P(B)}$

C. $\frac{P(A \text{ and } B)}{P(A)}$

D. $\frac{P(A)}{P(A \text{ and } B)}$

E. None of the above.

Question 43

Which of the following would fit the definition of the “statistical independence” of events A and B?

A. $P(A \cap B) = P(A) \times P(B)$

B. $P(A \text{ or } B) = P(A) + P(B)$

C. $P(A \text{ or } B) = P(A) + P(B) + P(A \text{ and } B)$

D. $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

E. None of the above.

Question 44

The probability that two events, A and B, both will occur, is given by the multiplication rule as:

A. $P(A \cap B) = P(A) \times P(B)$

B. $P(A \cap B) = P(A|B) \times P(B)$

C. $P(A \cap B) = P(B|A) \times P(B)$

D. Both B and C.

E. None of the above.

QUESTIONS 45 TO 47 ARE BASED ON THE FOLLOWING QUESTION:

Which of the following pairs of events would you expect to be independent, which mutually exclusive, and which neither?

Question 45

Being a pensioner this year and taking an international trip next year

A. independent

B. mutually exclusive

C. neither

- D. Both A and B.
- E. None of the above.

Question 46

Studying Statistics Education and being right-handed

- A. independent
- B. mutually exclusive
- C. neither
- D. Both A and B.
- E. None of the above.

Question 47

Owning a cat and paying veterinary bills

- A. independent
- B. mutually exclusive
- C. neither
- D. Both A and B.
- E. None of the above.

QUESTIONS 48 TO 51 ARE BASED ON THE FOLLOWING INFORMATION:

The following table is a summary of the energy sources used for cooking. Suppose you pick a house at random from the list of South African residents.

The energy sources for cooking

Energy source	Provinces of South Africa									Total
	Eastern Cape	Free State	Gauteng	KwaZulu- Natal	Mpumalanga	Northern Cape	Limpopo	North-west	Western Cape	
Electricity	323	264	1 246	700	314	97	183	234	750	4 111
Gas	48	24	45	56	18	18	27	38	23	297
Paraffin	391	301	279	300	160	33	127	264	132	1 987
Wood	537	60	50	520	146	56	627	158	44	2 198
Coal	12	48	89	34	107	23	23	23	21	380
Total	1 311	697	1 709	1 610	745	227	987	717	970	8 973

Question 48

What is the probability that the household will be from the Western Cape **or** the Eastern Cape?

A. $\frac{970}{8973} + \frac{97}{8973} = \frac{1067}{8973}$

B. $\frac{970}{8973} + \frac{1311}{8973} = \frac{2281}{8973}$

C. $\frac{1311}{8973} + \frac{227}{8973} = \frac{1538}{8973}$

D. Both A and C.

E. None of the above.

Question 49

What is the probability that the household uses paraffin as a source of energy **or** will be from Gauteng?

A. $\frac{297}{8973} + \frac{1709}{8973} + \frac{1987}{8973} = \frac{3993}{8973}$

B. $\frac{1987}{8973} + \frac{1987}{8973} - \frac{279}{8973} = \frac{3695}{8973}$

$$C. \frac{1987}{8973} + \frac{1709}{8973} - \frac{279}{8973} = \frac{3417}{8973}$$

D. Both C and D.

E. None of the above.

Question 50

What is the probability that the household will be from Limpopo **and** Mpumalanga, if two households were picked one after the other, with replacement?

$$A. \frac{314}{8973} \times \frac{97}{8973} = \frac{30458}{80514729}$$

$$B. \frac{987}{8973} \times \frac{745}{8973} = \frac{735315}{80514729}$$

$$C. \frac{717}{8973} \times \frac{227}{8973} = \frac{162759}{80514729}$$

D. Both A and B.

E. None of the above.

Question 51

What is the probability that the households will both be from the Eastern Cape, if two households were picked one after the other, without replacement?

$$A. \frac{1709}{8973} \times \frac{1709}{8973} = \frac{2920681}{80514729}$$

$$B. \frac{1311}{8973} \times \frac{1310}{8972} = \frac{1717410}{80505756}$$

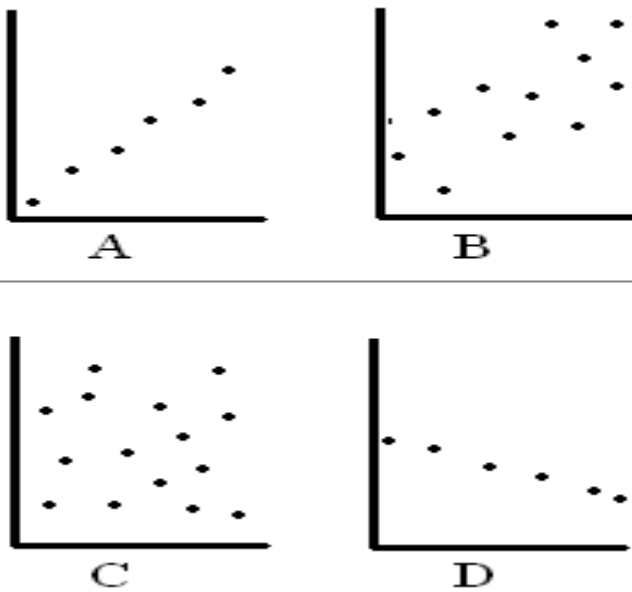
$$C. \frac{1311}{8973} \times \frac{1311}{8972} = \frac{1718721}{80505756}$$

D. Both B and C.

E. None of the above.

QUESTIONS 52 AND 53 ARE BASED ON THE FOLLOWING INFORMATION:

Graphs A to D show various patterns of relationships between x and y.

**Question 52**

Graph A shows _____.

- A. a weak linear relationship, positive
- B. a strong linear relationship, negative
- C. no linear relationship
- D. a strong linear relationship, positive
- E. a medium-strength linear relationship

Question 53

Graph B shows _____.

- A. a weak linear relationship, positive
- B. a strong linear relationship, negative
- C. no linear relationship
- D. a strong linear relationship, positive
- E. a medium-strength linear relationship, positive

QUESTIONS 54 AND 55 ARE BASED ON THE FOLLOWING INFORMATION:

A scatter plot graphically displays all pairs of data values of the independent and dependent variables.

Question 54

The independent variable is represented by the symbol(s) _____.

- A. y
- B. x
- C. xy
- D. Both A and B.
- E. None of the above.

Question 55

The dependent variable is also called the _____.

- A. explanatory variable
- B. vertical variable
- C. response variable
- D. Both A and B.
- E. None of the above.

Total: [55]

12.2.2 ASSIGNMENT 02 (COMPULSORY) – SEMESTER 2

Due date: 6 September 2019

Unique number: 7 4 3 3 4 1

Contributes 80% to semester mark.

Answer ALL the questions.

Question 1

Write a lesson plan for Grade 9 using the outcome: “At the end of this lesson learners should be able to represent the data in the table below on a histogram using the class intervals $60 \leq x \leq 69$, $70 \leq x \leq 79$, $80 \leq x \leq 89$, $90 \leq x \leq 99$ ”.

67	70	71	71	73	74	75	75
75	77	78	78	78	78	79	80
81	82	82	83	86	86	87	91

Guidelines

The task:

Describe the activity or activities that will enable the learners to discover how to construct a histogram.

Plan the “before” phase. How will you introduce or present the activity?

Plan the “during” phase. List possible hints you might give to assist the learners.

Plan the “after” phase. How will the learners report their findings? What questions will you ask to assess their understanding? (See Van de Walle, “Planning in the problem-based classroom”).

The lesson plan must be in such a format that the teacher will be able to apply it without any inputs of his or her own. For example, do not merely **say**, “I will have an assessment activity that will assess their understanding” – also **show** the worksheet for assessment.

[10]

Question 2

The table below shows the Statistics test results for a group (population) of 65 learners from a school:

Statistics test results										
71	72	34	82	55	28	50	96	24	45	80
34	32	29	43	36	51	18	57	64	67	66
47	45	24	52	53	81	54	66	75	34	71
39	39	38	24	51	44	52	39	42	55	80
54	55	36	54	34	800	64	24	55	67	80
46	46	25	52	53	86	50	46	74	60	

- 2.1 Use the information in the table to calculate:
- 2.1.1 The mean (correct to 3 decimal places) (2)
 - 2.1.2 The median (2)
 - 2.1.3 The mode (2)
- 2.2 Which is the better measure of the central tendency for this data – the mean or the median? Explain your answer. (2)
- 2.3 Calculate:
- 2.2.1 the variance (correct to 3 decimal places) (3)
 - 2.2.2 the standard deviation (correct to 3 decimal places) (2)
 - 2.2.3 the range (2)
 - 2.2.3 the interquartile range (6)
 - 2.2.4 the semi-interquartile range (2)
- 2.4 Which is the better measure of the spread of the data – the standard deviation or the interquartile range? Explain your answer. (3)
- 2.5 Draw and label a box-and-whisker plot to illustrate the dispersion of the Statistics test results. (5)

- 2.6 Do the data contain an outlier(s)? Explain your answer. (5)
- 2.7 Present these results in a frequency table. (5)
- 2.8 Draw a histogram of the test results. (6)
- 2.9 What can you conclude from the histogram you have drawn in 2.8? (2)

[49]

Question 3

The ages of the 32 patients in one ward of a hospital on a certain night were as follows:

Female: 48; 65; 28; 72; 50; 53; 61; 30; 77; 53; 55; 38; 62, 62, 65, 50

Male : 21; 55; 75; 71; 56; 74; 33; 61; 67; 67; 71; 43; 78, 55, 56, 67

Draw a back-to-back stem-and-leaf diagram to illustrate this information.

[8]

Question 4

A house agent wanted to know the extent to which the selling price of a home is related to its size.

The table shows the price in thousands of rands and the size in hundreds of square feet.

Price in thousands of rands	25	15	24	20	22	12	32	26
Size in hundreds of square feet	310	305	308	306	309	214	320	312

- 4.1 Identify the dependent and independent variables. (2)
- 4.2 Draw a scatter plot of the sample data. (5)
- 4.3 Do you think that there is a statistical relationship between the selling price and size? If so, describe the nature of the relationship. (3)

[10]

Question 5

The table below shows the speeds of motorists recorded on a road between Swellendam and Robertson.

Speed in km/h	Frequency	Relative frequency	Cumulative relative frequency	Cumulative relative frequency %
$50 \leq x < 60$	22			
$60 \leq x < 70$	28			
$70 \leq x < 80$	29			
$80 \leq x < 90$	53			
$90 \leq x < 100$	26			
$100 \leq x < 110$	10			
$110 \leq x < 120$	12			
$120 \leq x < 130$	10			

- 5.1 Draw an OGIVE (cumulative relative frequency percentages graph) to illustrate the data in the table. (3)
- 5.2 Use the graph to estimate:
- 5.2.1 the median speed (2)
- 5.2.2 the interquartile range (5)
- 5.2.3 the semi-interquartile range (1)
- 5.3 Use the table of speeds of motorists to fill in the blanks.
- 5.3.1 The percentage of speeds of motorists that are less than 80 km/h is _____. (2)
- 5.3.2 The percentage of speeds of motorists that are from 110 to 120 km/h is _____. (2)
- 5.3.3 The percentage of speeds of motorists that are from 90 to 120 km/h is _____. (2)
- 5.3.4 The percentage of speeds of motorists that are more than 100 km/h is _____. (2)

- 5.3.5 The number of speeds of motorists in the sample who are between 60 and 110 km/h is _____. (2)

[21]

Question 6

In the red bag, there are three cards numbered 2, 4 and 6. In yellow bag, there are also three cards numbered 1, 3 and 5. One card is drawn at random from each bag and the values of the two cards are added together.

- 6.1 Use a table to list all the possible outcomes for the activity. (5)
- 6.2 What is the probability that the sum of the two values will be an even number? (2)
- 6.3 What is the probability that the sum will be less than 11? (2)
- 6.4 What is the probability that the sum will be 11? (2)
- 6.5 What is the probability that the sum will be a multiple of 3? (2)

[13]

Question 7

A packet contains 20 fruit-flavoured sweets. There are six pineapple-flavoured, four melon-flavoured, three lemon-flavoured, two banana-flavoured and five strawberry-flavoured sweets.

- 7.1 Sophy picks a sweet from the packet without looking. What is the probability that she will pick either a melon-flavoured or a lemon-flavoured sweet? (4)
- 7.2 Lebo does not like banana-flavoured or melon-flavoured sweets. She likes all the other flavours. What is the probability that she will pick a sweet that she likes? (3)

[7]

Question 8

A bag has 4 red balls and 8 blue balls in it. First, one ball is drawn and then a second ball is drawn without the first being put back.

- 8.1 Calculate the probability that the first ball drawn will be red. (2)
- 8.2 Calculate the probability that both balls will be blue. (2)

8.3 Calculate the probability that one ball will be blue and the other red, in any order. (2)

[6]

Question 9

The following table is a summary of the energy sources used for cooking:

Energy source	Provinces									Total
	Eastern Cape	Free State	Gauteng	KwaZulu-Natal	Mpumalanga	Northern Cape	Limpopo	North-West	Western Cape	
Electricity	310	271	1 429	756	214	97	210	242	750	4 279
Paraffin	49	25	34	52	14	18	17	34	48	291
Wood	397	223	380	296	104	33	120	264	132	1 949
Coal	509	58	18	490	156	34	621	148	44	2 078
Gas	11	40	87	43	108	7	23	25	7	351
Total	1 276	617	1 948	1 637	596	189	991	713	981	8 948

Suppose you can pick a household at random from the list of South African residences. What is the probability that the household

9.1 will be from North-West? (1)

9.2 will use electricity as a source of energy, given that the household is from Limpopo? (2)

9.3 will be from Mpumalanga, given that the household uses gas as a source of energy? (3)

[6]

Total: 130