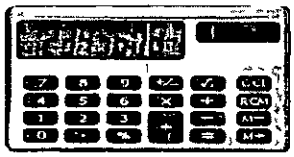
UNIVERSITY EXAMINATIONS



UNIVERSITEITSEKSAMENS

UNISA university of south africa

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PSYCHOLOGICAL RESEARCH

Duration 2 Hours 70 Marks

EXAMINERS

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Use of a non-programmable pocket calculator is permissible

Closed book examination

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This paper consists of 19 pages plus 2 blank pages for rough work (pp 20 & 21) plus 1 page (i) of formulae and 4 pages of tables (ii-v) as well as instructions for the completion of a mark reading sheet

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After completing your answers, you must hand in the following

(i) The mark reading sheet
(ii) The question paper (All the pages must be handed in)

This exam paper consists of seventy items Your mark will be converted to a mark out of 80 and 20% of your year mark (from the assignments) will be added, to produce a mark out of 100 [Note however, that if your exam mark is less than 40% the year mark will not be added]

ENSURE THAT YOU HAVE WRITTEN YOUR **STUDENT NUMBER** AND **COURSE CODE** ON THE MARK READING SHEET

Please complete the attendance register on the back page, tear off and hand to the invigilator

[TURN OVER]

ANSWER THE FOLLOWING SEVENTY MULTIPLE CHOICE QUESTIONS ON THE MARK READING SHEET. READ THE ATTACHED INSTRUCTIONS AND FOLLOW THEM CAREFULLY.

Question 1

The process of finding a way to measure a construct so that it can be represented by a variable is referred to as - - - - -

1 inference
2 operasionalization
3 setting a hypothesis

Question 2

Mean, range, variance and standard deviation are examples of - - - - -

1 variables
2 descriptive statistics
3 inferential statistics

Question 3

A theory is a(n) - - - - -

1 process of careful observation
2 method to make a construct observable
3 explanation of why facts are as they are observed to be

Question 4

The process of selecting a subset of a population for a survey is known as - - - - -

1 triangulation
2 sampling
3 operationalization

Question 5

An inference is - - - - -

1 an explanation of why certain things are as they are observed to be
2 an educated guess about how certain phenomena may be interrelated
3 a generalization from a sample to a population which have a high probability of being true

Question 6

"Empirically" means "based on - - - - -"

1 theory
2 observations
3 facts

Question 7

Which of the following best describes "latent"?

1 observable
2 hidden
3 independent

Question 8

A psychologist has a theory that visual perceptual ability influences the marks that learners will get in a mathematics test In this example 'visual perceptual ability' the - - - - - variable

1 dependent
2 independent
3 hidden

Question 9

When a construct is measured the resulting quantity is referred to as a - - - - -

1 variable
2 mean
3 standard error

Question 10

A psychologist is interested in studying the interaction between small groups of four to five people in each group He suspects that the interactions between such groups can be described in similar terms to the interactions between individual persons In order to be able to do a scientific study of this (a) - - - - - question, he would have to provide a(an) (b) - - - - - definition of the (c) - - - - - called "interaction"

1	(a) research	(b) operational	(c) construct
2	(a) experimental	(b) research	(c) statistic
3	(a) hypothetical	(b) empirical	(c) parameter

Question 11

The variable manipulated by the researcher in an experiment is called the - - - - - variable

1 empirical
2 independent
3 dependent

Question 12

The term 'population' refers to - - - - -.

1 the entire group from which the data is to be selected
2 a subset of cases selected to represent the entire group
3 the entire set of variables which will be considered in the research

Question 13

The symbol $\bar{x}$ refers to - - - - -, while μ refers to - - - - -

1 sample mean, population mean
2 sample mean, sample standard deviation
3 population mean, population variance

Question 14

In probability theory, the number of distinct events that could possibly occur during the performance of an experiment is referred to as the - - - - -

1 probability distribution
2 frequency distribution
3 sample space

Question 15

The table below gives frequency distribution of the exam marks of a number of students in a psychology exam

Range of marks	Number of students in this range (Frequency count)
40% and below	8
41% – 50%	12
51% – 60%	20
61% – 70%	30
71% – 80%	22
81% and above	18

What is the probability that a student will get a mark of between 51% and 70%? (Rounded off)

1 0 45
2 0 82
3 0 18

Question 16

A test for short-term memory capacity is normally distributed with a mean of $\mu = 100$ and a standard deviation of $\sigma = 10$ What is the probability that any person, chosen at random, will have a score of $x = 125$ or more on this test?

1 0 0668
2 0 0228
3 0 0062

Question 17

Suppose the weights of the population of military recruits are distributed normally with a mean of 64 kg and a standard deviation of 8 kg Different samples of these recruits, each with a sample size of 16, are drawn repeatedly We would expect the standard deviation of the sample means (the standard error) to be about - - - - - kg

1 2
2 8
3 4

Question 18

A marble is drawn at random from a box containing 6 red marbles, 4 green marbles and 5 blue marbles If one marble is drawn at random from the box, what is the probability that it will be red? (Rounded off)

1 0 07
2 0 4
3 0 17

Question 19

There are 19 female and 8 male students in a group of psychology students Of the 19 females, only 4 has no brothers or sisters, while 3 of the males are only children If a student is selected at random from the group, what is the probability that it will be a female with no siblings? (Results are rounded off).

1 4/19 = 0 21
2 19/27 = 0 70
3 4/27 = 0 15

Question 20

A variable is normally distributed with a mean of 50 and a standard deviation of 10 If this variable is transformed to a standardized normal distribution, what would the values of the mean and standard deviation on the z-distribution be?

1 Mean z = 0, Standard deviation z = 1
2 Mean z = 1, Standard deviation z = 0
3 Mean z = 50, Standard deviation z = 10

Question 21

The probability of an event can be determined by - - - - -

1 the set of all possible values of a statistic when all possible values of a fixed size are taken from the population
2 observing the number of times that the event occurs, and dividing this by the number of events that could possibly occur during the specific experimental situation
3, the distribution of means obtained from all possible samples which can be established by applying the central limit theorem

Question 22

By convention, the total area under the standard normal curve is set equal to - - - - -

1 zero
2 its standard deviation
3 one

Question 23

The mean and standard deviation of a set of test scores are 20 and 8 respectively If the z-score which corresponds to a test score of 14 is calculated, in which of the intervals listed below would it fall?

1 0 5
2 – 0 75
3 0 75

Question 24

The distribution of sample means for a number of samples drawn from the same population can be determined because of - - - - -

1 the z-distribution
2 the central limit theorem
3 statistical inference

Question 25

The *asymptotic* property of the normal curve refers to the fact that - - - - -

1 the curve is bell-shaped
2 the endpoints of the curve get continuously closer to the x-axis without ever touching it
3 the curve is symmetrical

Question 26

Consider a hypothesis which describes a possible relationship between two variables The null hypothesis refers to which specific kind of relationship between the variables?

1 No relationship
2 A positive relationship
3 A significant relationship

Question 27

Statistical hypotheses are statements about - - - - -

1 population parameters
2 sample statistics
3 the z-distribution

Question 28

Suppose we have stated H_0 $\mu = 10$, and H_1 $\mu < 10$, and find that the sample mean corresponds to a z-score of -3 This means that the corresponding p-value - - - - -

1 need not be found to reach a decision
2 is equal to 0 0026
3 is equal to 0 0013

Question 29

The hypothesis "H_1 $\mu > 50$" is a (a) - - - - - hypothesis and requires a (b) - - - - - statistical test

1 (a) directional (b) two-tailed
2 (a) non-directional (b) two-tailed
3 (a) directional (b) one-tailed

Question 30

The level of significance of a statistical test - - - - -

1 refers the p-value which is calculated from the test statistic
2 indicates the maximum risk that a researcher is willing to take of making an error of Type I
3 is used to indicate the probability of making an error by not rejecting the null hypothesis

Question 31

When applying a statistical test, if the p-value is larger than the level of significance, we - - - - - the alternative hypothesis

1 do not accept
2 fail to reject
3 accept

Question 32

A type II error occurs when - - - - -

1 the null hypothesis is rejected when it should not be rejected
2 the null hypothesis is not rejected when it should be rejected
3 the alternative hypothesis not accepted when it should be accepted

Base your answers to Questions 33 to 37 on the following scenario:

Rose is interested in the problem of depth perception She wonders whether fine artists who have made a study of the problem of perspective would be better at judging depth than people in general She decides to investigate this using a test for depth perception which was standardized on the general population with a mean of 5, where a greater number implies better depth perception on a scale of 1 to 9 She randomly draws 100 students who had graduated from a school for fine arts and tests each of them on the depth perception test She finds that the mean depth perception score of her sample is 6 2 and the sample standard deviation is 1 7

Question 33

How would you describe the population investigated in this research?

1 The general population
2 Fine artists who studied perspective
3 Fine artists from a specific school for fine arts

Question 34

Which of the following best describes the research or theoretical hypothesis to be tested?

1 Depth perception is related to artistic ability
2 Visual artists have a superior ability for depth perception than people in general
3 The relationship between depth perception and artistic ability is statistically significant

Question 35

Which of the following are appropriate null and alternative hypotheses?

1 $H_0\ \mu = 5,\quad H_1\ \mu \neq 5$
2 $H_0.\ \mu = 5,\quad H_1\ \mu > 5$
3 $H_0\ \mu \neq 5,\quad H_1\ \mu > 5$

Question 36

Which is the correct value of the standard deviation of the sampling distribution of the mean (the standard error) of the depth perception scores?

1 1 7
2 0 017
3 0 17

Question 37

Which is the appropriate test statistic to calculate?

1 The t-statistic for the mean of a single group
2 The z-statistic for the mean of a single group
3 The t-statistic for the difference between the means of two dependent groups

Question 38

When two population means are compared, the p-value is calculated to represent the probability of observing a specific difference between the sample means given that - - - - -

1 H_0 is true
2 H_1 is true
3 H_0 is false

Question 39

What should a researcher do if a small difference between two means based on a large sample is found to differ significantly, to determine whether the outcome is of practical importance?

A psychologically unimportant result may turn out to be statistically significant if the researcher - - - - -

1 set a lower level of significance
2 determine the power of the statistical test
3 calculate the effect size

Question 40

The mean score of a sample of research participants is compared with a population mean of 20 for that particular questionnaire The following hypothesis is to be tested

H_0 $\mu = 20$
H_1 $\mu \neq 20$

A researcher draws a random sample of 50 persons and obtains a mean score of 25 and a standard deviation of 4 on this questionnaire If *the null hypothesis is true*, what would you expect the probable value of the mean of the sample to have been?

1 20
2 25
3 Not equal to 20

Question 41

When two means are compared, the p-value expresses the probability that a difference which is observed between the means in a sample of measurements - - - - -

1 will be significant
2 is due to the alternative hypothesis
3 is due to chance or sampling error

Question 42

Which symbol is conventionally used to indicate the value of the maximum probability that an error would be made if the null hypothesis is rejected which a particular researcher is willing to allow?

1 α
2 β
3 σ

Question 43

Cohen's d refers to the - - - - -

1 difference score when two means from dependent samples are compared
2 effect size
3 power of a test

Question 44

Effect size is calculated to determine - - - - -

1 whether an effect is statistically significant or not
2 the ability of a statistical test to detect a significant relationship between variables when such a relationship does in fact exist
3 whether a significant effect is meaningful from a practical point of view irrespective of sample size

Question 45

A random sample of n=100 people are tested to see how many items they can recall from a list with pictures of 12 items The distribution of the results is found to be more or less normal with a mean of $\bar{x} = 7$ and a standard deviation of s = 2 0 What is the probability that a specific person, chosen at random from the general population, will remember 10 or more items from the list?

1 Less than 0
2 Between 0 and 0 1
3 Greater than 0 1

Question 46

Under which condition would a researcher use a t-statistic to test a hypothesis about an unknown population mean μ?

The value of the (a) - - - - - is (b) - - - - -

1 (a) population standard deviation σ, (b) unknown
2 (a) standard error $s_{\bar{x}}$, (b) unknown
3 (a) population standard deviation σ, (b) known

Base your answers to Questions 47 to 49 on the following scenario.

Suppose that the memory span of adults is normally distributed with a mean of 7 items and a standard deviation of 2 items A researcher is investigating the impairment of memory among persons who have been diagnosed as suffering from Korsakoff's syndrome (a neurological disorder linked to chronic alcohol abuse) He intends to test his prediction on a sample of 50 persons who were diagnosed as suffering from this syndrome

Question 47

If μ refers to the mean memory span of the *population* of persons suffering from Korsakoff's syndrome, which of the following is an appropriate *null hypothesis* for testing the above prediction?

1 H_0 $\mu < 7$
2 H_0 $\mu = 7$
3 H_0 $\mu \neq 7$

Question 48

Which of the following is an appropriate *alternative hypothesis* for testing the above prediction, regarding the mean memory span of the population of persons suffering from Korsakoff's syndrome?

1 H_1 $\mu < 7$
2 H_1 $\mu = 7$
3 H_1. $\mu \neq 7$

Question 49

Testing the above prediction on a sample will require a - - - - - statistical test

1 non-directional
2 two-tailed
3 directional

Question 50

A pharmaceutical company claims that a new sleeping pill which they are marketing will put people to sleep in less than 15 minutes A researcher wants to test see if the average time before people fall asleep after using this pill matches this claim She uses the following hypothesis

H_0 $\mu = 15$ H_1 $\mu < 15$

Suppose she tests this on a random sample of n = 40 research participants who suffer from insomnia She finds that the mean time before members of the sample fall asleep after using the pill is 14 3 minutes with a standard deviation of 3 2 A subsequent t-test produces a two-tailed p-value of 0 0345 and the level of significance was set at 0 05 What is the value of the one-tailed or directional p-value?

1 0 03450
2 0 01725
3 0 06900

Question 51

A researcher wants to compare the mean of the non-verbal reasoning scores of a sample of n=25 students with that of the general population According to the literature, the non-verbal reasoning test which she uses was standardized to a population mean of $\mu = 100$ and a population standard deviation of $\sigma = 10$ What is the value of the standard deviation of the sampling distribution of the mean, which will be required to calculate the $z_{\bar{x}}$ test statistic?

1 0 4
2 10
3 2

Question 52

What does it mean to say "the difference between the means of groups A and B is statistically significant"?

1 The alternative hypothesis is valid
2 The alternative hypothesis should be rejected
3 The null hypothesis cannot be rejected

Base your answers to Questions 53 and 54 on the following scenario:

A market researcher is asked to conduct a study to examine people's reaction to a movie trailer He draws a random sample of 20 males and 20 females who saw the trailer He asks them to indicate how likely it is that they will go and see the movie on a 7-point scale, where 1 indicates 'not at all' and 7 indicates 'definitely ' He wants to compare to establish whether males and females differ in their intention to see the movie based on an exposure to the trailer

Suppose the researcher finds that the mean and standard deviations for each group in the sample is as follows

Males	$\bar{x}_M = 5\ 7$	$s_M = 2\ 1$
Females	$\bar{x}_F = 4\ 19$	$s_F = 1\ 6$

Question 53

Which is the appropriate way to indicate the researcher's hypothesis which is to be tested?

1 $H_0\ \bar{x}_M = \bar{x}_F$ $H_1\ \bar{x}_M \neq \bar{x}_F$
2 $H_0.\ \mu_M = \mu_F$ $H_1\ \mu_M > \mu_F$
3 $H_0\ \mu_M = \mu_F$ $H_1\ \mu_M \neq \mu_F$

Question 54

Which is the appropriate t-test statistic to calculate to evaluate the significance of the researcher's hypotheses?

1 The t-statistic for the difference between the means of two independent samples
2 The t-statistic for the mean of a single sample
3 The t-statistic for the difference between the means of two dependent samples

Question 55

A researcher is asked by a motivational speaker to establish whether a workshop on assertiveness training is effective The researcher decides to use a particular questionnaire which tests an individual's level of assertiveness He presents the questionnaire to each of a sample of 50 participants in the workshop before it begins and once again after it has ended to the same participants When analysing these results the researcher should use a statistical test for the - - - - -

1 comparison of means for a single group
2 comparison of means for two dependent groups
3 comparison of means for two independent groups

Question 56

Which is a *Type II error* in statistical significance testing?

1 Rejecting the null hypothesis when it is in fact true
2 Not rejecting the null hypothesis when it is in fact false
3 Rejecting the alternative hypothesis when it is in fact true

Question 57

Two samples may be regarded as independent when - - - - -

1 there is no systematic relationship between the composition of one sample and the other
2 they were drawn at different occasions
3 they are both totally random

Question 58

A sample of 70 people are tested on a test for assertiveness before and after a workshop in which they are given assertiveness training Which of the following is the most appropriate formula for comparing the mean assertiveness score before the training with the one thereafter?

1 $t_{\bar{x}} = \frac{(\bar{x}-\mu)}{s_{\bar{x}}}$

2 $t_c = \frac{(\bar{x}_1-\bar{x}_2)}{\sqrt{\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}}}$

3 $t_{\bar{d}} = \frac{\bar{d}}{\frac{s_{\bar{d}}}{\sqrt{n}}}$

Base your answers to Questions 59 and 60 on the following scenario:

A researcher compares a sample of children from a special school for gifted children with a group of children randomly drawn from other schools on a test which measures the creativity of the children on a 9-point scale She wants to know whether the children from the school for gifted children is likely to have greater levels of creativity, planning to test at of α = 0 01

Based on the sample, she finds the following

	Sample size	Sample mean	Sample standard deviation
Group 1 (gifted children)	100	5 5	1 2
Group 2 (other children)	300	4 9	0 8
All children pooled	400	5 1	1 0

Question 59

What is an appropriate *alternative* hypothesis for this research scenario?

1 $H_1 \quad \bar{x}_1 \neq \bar{x}2$
2 $H_1 \quad \mu_1 \neq \mu_2$
3 $H_1 \quad \mu_1 > \mu_2$

Question 60

She calculates a t-test statistic of t_c = 4 196 and uses a computer program to determine that p=0 0002 for two-sided testing, which is highly significant She is however concerned that this significant result may be due to the relatively large sample sizes, so she decides to also calculate the effect size to determine whether the result is meaningful irrespective of this

She decides to calculate Cohen's d, using the formula $d = \frac{\bar{x}_1-\bar{x}_2}{s_p}$

The table below can be used as a guide to judge the practical importance of the result

Effect size	Practical importance
Less than 0 4	Small
Between 0 4 and 0 8	Medium
Greater than 0 8	Large

Based on the calculated effect size, the researcher can conclude that the practical implication of her finding is - - - - -

1 Small
2 Medium
3 Large

Question 61

A scatter plot is a graphical representation of the relation between - - - - -

1 two variables measured on a nominal scale within a single group
2 two variables measured on a ratio or interval scale within a single group
3 two groups of subjects measured on an interval or ratio scale on a single variable

Question 62

A researcher would calculate a correlation coefficient in order to establish - - - - -

1 the effect size of a statistical test where two means were compared for significance
2 the size of the relationship which exists between two continuous variables
3 whether a particular variable is distributed according to the z-distribution

Question 63

Which of the combinations of the options below can be substituted in the following sentence to describe the situation when a significant *negative* correlation is found between two variables X and Y?

A person who scores - - - - - on variable X is likely to have a - - - - - score on variable Y

1 low, low
2 low , high
3 high, high

Question 64

A researcher wants to establish whether the type of employment category that is filled by employees of a particular company is significantly related to their gender The employees can be categorized as manager, human resources, administrative, maintenance or information technology worker and the genders are male or female Which would be the most appropriate test to use?

1 the t-test for two independent samples
2 Pearson's correlation test statistic
3 the chi-square (χ^2) test statistic

Base your answers to Questions 65 and 66 on the following scenario:

A group of hospitalized patients who have been diagnosed as suffering from dementia are treated with certain drugs over a period of time These drugs were prescribed to improve their mental alertness A researcher studies a random sample of 30 these patients who have been on these drugs for varying amounts of time, hoping to establish a relationship between the number of days of drug treatment and patients' scores on a Mental Alertness Test

Question 65

Which is the correct formal way to express the appropriate *null hypothesis* for this research?

1 H_0 $\rho = 0$
2 H_0 $\mu = 0$
3 H_0 $r = 0$

Question 66

Which is an appropriate test to determine the significance of the relationship between the number of days that the drug was administered and the score on the Mental Alertness Test obtained by the sample of patients?

1 The chi-square (χ^2) test
2 The test based on Pearson's product-moment correlation
3 A t-test for one sample

Question 67

What would the *expected frequency* in cell **AX** of the following contingency table be, if we were to assume that the data in the cells in the table are distributed in a proportional way across the rows and columns? (Rounded off to two places)

	X	Y
A	7	3
B	5	4

1 0 37
2 6 32
3 7 00

Question 68

If there is *no relationship at all* between two variables X and Y, what would be the most likely value of Pearson's correlation coefficient **r**, out of the following?

1 -1 0
2 0 5
3 0 0

Question 69

A *contingency table* represents - - - - -

1 the distribution of the frequencies for a variable
2 frequency counts for each of a number of possible outcomes of an experiment
3 the frequency counts if each outcome measured on two nominal-scale variables when they are cross-classified

Question 70

Which of the values given below is the closest to the probable value of the Pearson's product moment correlation coefficient for the variables **X** and **Y**?

Variable X	1	2	3	4	5	6	7	8
Variable Y	8	7	6	5	4	3	2	1

1 –1 0
2 0
3 1 0

[TOTAL: 70]

END OF EXAM PAPER

List of formulae:

$$\frac{\bar{x}-\mu_{\bar{x}}}{\sigma_{\bar{x}}} = \frac{(\bar{x}-\mu)}{\frac{\sigma}{\sqrt{n}}}$$

$$\frac{(\bar{x}-\mu)}{s_{\bar{x}}} = \frac{\bar{x}-\mu}{\frac{s}{\sqrt{n}}}$$

$$\frac{(\bar{x}_1-\bar{x}_2)}{\sqrt{\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}}}$$

$$\frac{\bar{d}-\bar{D}}{s_{\bar{d}}/\sqrt{n}} = \frac{\bar{d}}{s_{\bar{d}}/\sqrt{n}} \qquad (if\ \bar{D}=0)$$

$$\frac{cov(x,y)}{\sqrt{var(x)\,var(y)}} = \frac{n\sum xy-(\sum x)(\sum y)}{\sqrt{[n\sum x^2-(\sum x)^2][n\sum y^2-(\sum y)^2]}}$$

$$\sum_{ij}\frac{(O_{ij}-E_{ij})^2}{E_{ij}}$$

$$\frac{x-\bar{x}}{s} \quad or \quad \frac{x-\mu}{\sigma}$$

$$\sqrt{\frac{\sum(x-\bar{x})^2}{n-1}}$$

$$\frac{\bar{x}_1-\bar{x}_2}{s_p}$$

Appendix. Probabilities associated with the standard normal distribution (z)

z	Mean to z	Larger portion	Smaller portion	z	Mean to z	Larger portion	Smaller portion
0 00	0 0000	0 5000	0 5000	0 51	0 1950	0 6950	0 3050
0 01	0 0040	0.5040	0 4960	0 52	0 1985	0 6985	0 3015
0 02	0 0080	0 5080	0 4920	0 53	0 2019	0.7019	0.2981
0 03	0.0120	0 5120	0 4880	0 54	0 2054	0 7054	0 2946
0 04	0.0160	0.5160	0 4840	0 55	0 2088	0 7088	0.2912
0 05	0 0199	0 5199	0 4801	0 56	0 2123	0 7123	0.2877
0 06	0 0239	0 5239	0 4761	0 57	0 2157	0 7157	0 2843
0 07	0 0279	0 5279	0 4721	0 58	0 2190	0.7190	0 2810
0 08	0.0319	0 5319	0 4681	0 59	0 2224	0 7224	0.2776
0 09	0 0359	0 5359	0 4641	0 60	0 2257	0 7257	0.2743
0 10	0.0398	0 5398	0.4602	0.61	0 2291	0 7291	0 2709
0 11	0 0438	0 5438	0 4562	0 62	0 2324	0 7324	0 2676
0 12	0 0478	0 5478	0 4522	0 63	0 2357	0 7357	0 2643
0 13	0 0517	0 5517	0 4483	0 64	0 2389	0 7389	0 2611
0.14	0.0557	0.5557	0 4443	0.65	0 2422	0 7422	0 2578
0 15	0 0596	0 5596	0 4404	0.66	0 2454	0.7454	0.2546
0 16	0.0636	0 5636	0 4364	0 67	0 2486	0 7486	0 2514
0 17	0 0675	0.5675	0 4325	0.68	0 2517	0 7517	0.2483
0 18	0 0714	0.5714	0 4286	0 69	0 2549	0 7549	0 2451
0 19	0 0753	0 5753	0 4247	0 70	0.2580	0.7580	0 2420
0 20	0.0793	0 5793	0 4207	0.71	0 2611	0 7611	0.2389
0 21	0.0832	0 5832	0 4168	0 72	0 2642	0 7642	0.2358
0 22	0 0871	0 5871	0 4129	0.73	0.2673	0 7673	0.2327
0 23	0 0910	0 5910	0 4090	0 74	0 2704	0 7704	0 2296
0 24	0 0948	0 5948	0 4052	0 75	0 2734	0 7734	0.2266
0 25	0 0987	0.5987	0.4013	0.76	0 2764	0 7764	0 2236
0 26	0 1026	0 6026	0 3974	0 77	0 2794	0 7794	0 2206
0 27	0 1064	0.6064	0 3936	0.78	0 2823	0 7823	0 2177
0 28	0 1103	0 6103	0 3897	0 79	0 2852	0 7852	0 2148
0 29	0.1141	0.6141	0.3859	0.80	0.2881	0 7881	0 2119
0 30	0.1179	0 6179	0 3821	0 81	0.2910	0.7910	0 2090
0 31	0 1217	0 6217	0 3783	0 82	0 2939	0 7939	0 2061
0 32	0 1255	0.6255	0.3745	0.83	0 2967	0 7967	0.2033
0 33	0 1293	0 6293	0 3707	0 84	0 2995	0 7995	0 2005
0 34	0 1331	0 6331	0 3669	0 85	0 3023	0 8023	0 1977
0 35	0 1368	0 6368	0 3632	0 86	0 3051	0 8051	0 1949
0 36	0 1406	0 6406	0 3594	0 87	0 3078	0 8078	0 1922
0 37	0 1443	0 6443	0 3557	0 88	0 3106	0 8106	0 1894
0 38	0 1480	0 6480	0 3520	0.89	0 3133	0 8133	0 1867
0 39	0 1517	0 6517	0 3483	0 90	0 3159	0 8159	0 1841
0 40	0.1554	0 6554	0.3446	0 91	0.3186	0 8186	0 1814
0 41	0 1591	0 6591	0 3409	0 92	0 3212	0 8212	0 1788
0 42	0.1628	0 6628	0 3372	0.93	0 3238	0 8238	0 1762
0 43	0 1664	0 6664	0 3336	0.94	0 3264	0 8264	0.1736
0 44	0 1700	0 6700	0 3300	0 95	0.3289	0 8289	0 1711
0 45	0 1736	0 6736	0 3264	0 96	0.3315	0 8315	0 1685
0 46	0 1772	0 6772	0 3228	0 97	0 3340	0 8340	0.1660
0 47	0 1808	0 6808	0 3192	0 98	0 3365	0 8365	0.1635
0 48	0 1844	0 6844	0 3156	0 99	0 3389	0 8389	0 1611
0 49	0 1879	0 6879	0 3121	1 00	0 3413	0 8413	0 1587
0 50	0 1915	0 6915	0 3085	1 01	0 3438	0 8438	0 1562

Appendix: Probabilities associated with the standard normal distribution (z) continued

z	Mean to z	Larger portion	Smaller portion	z	Mean to z	Larger portion	Smaller portion
1 02	0 3461	0.8461	0 1539	1 53	0.4370	0 9370	0 0630
1 03	0 3485	0 8485	0 1515	1 54	0 4382	0 9382	0 0618
1 04	0 3508	0 8508	0 1492	1 55	0 4394	0 9394	0 0606
1 05	0 3531	0.8531	0.1469	1 56	0 4406	0 9406	0 0594
1 06	0 3554	0 8554	0 1446	1 57	0 4418	0 9418	0 0582
1 07	0 3577	0 8577	0.1423	1 58	0 4429	0 9429	0.0571
1.08	0 3599	0 8599	0 1401	1.59	0 4441	0 9441	0 0559
1 09	0 3621	0 8621	0 1379	1 60	0 4452	0 9452	0 0548
1 10	0 3643	0 8643	0 1357	1 61	0 4463	0 9463	0 0537
1 11	0 3665	0 8665	0 1335	1 62	0 4474	0 9474	0 0526
1 12	0 3686	0 8686	0 1314	1 63	0 4484	0 9484	0.0516
1 13	0 3708	0 8708	0 1292	1 64	0 4495	0 9495	0 0505
1 14	0 3729	0 8729	0 1271	1 65	0 4505	0 9505	0 0495
1 15	0 3749	0 8749	0 1251	1 66	0 4515	0.9515	0 0485
1 16	0 3770	0 8770	0 1230	1.67	0 4525	0 9525	0 0475
1 17	0 3790	0 8790	0 1210	1 68	0 4535	0 9535	0 0465
1 18	0 3810	0 8810	0 1190	1 69	0 4545	0 9545	0 0455
1 19	0 3830	0 8830	0 1170	1 70	0 4554	0 9554	0 0446
1 20	0 3849	0 8849	0 1151	1 71	0 4564	0 9564	0 0436
1 21	0 3869	0 8869	0 1131	1.72	0 4573	0.9573	0.0427
1 22	0 3888	0 8888	0 1112	1.73	0.4582	0 9582	0 0418
1 23	0.3907	0 8907	0 1093	1 74	0 4591	0 9591	0 0409
1 24	0 3925	0 8925	0.1075	1 75	0 4599	0 9599	0 0401
1 25	0 3944	0 8944	0 1056	1 76	0 4608	0 9608	0 0392
1 26	0 3962	0 8962	0 1038	1.77	0 4616	0.9616	0 0384
1 27	0 3980	0.8980	0.1020	1.78	0.4625	0 9625	0 0375
1 28	0 3997	0 8997	0 1003	1 79	0 4633	0 9633	0 0367
1 29	0 4015	0 9015	0 0985	1 80	0 4641	0 9641	0 0359
1 30	0 4032	0 9032	0 0968	1 81	0 4649	0 9649	0 0351
1 31	0 4049	0.9049	0 0951	1 82	0 4656	0 9656	0 0344
1 32	0 4066	0 9066	0.0934	1 83	0 4664	0.9664	0.0336
1 33	0 4082	0 9082	0 0918	1 84	0 4671	0 9671	0.0329
1 34	0 4099	0 9099	0 0901	1 85	0 4678	0 9678	0.0322
1 35	0 4115	0.9115	0 0885	1.86	0 4686	0 9686	0 0314
1 36	0 4131	0 9131	0 0869	1 87	0 4693	0 9693	0.0307
1 37	0 4147	0 9147	0 0853	1 88	0 4699	0 9699	0 0301
1 38	0.4162	0 9162	0 0838	1 89	0 4706	0 9706	0 0294
1 39	0.4177	0.9177	0 0823	1 90	0 4713	0 9713	0 0287
1 40	0 4192	0.9192	0 0808	1 91	0 4719	0 9719	0 0281
1 41	0.4207	0 9207	0 0793	1.92	0 4726	0 9726	0.0274
1 42	0 4222	0 9222	0 0778	1 93	0 4732	0 9732	0 0268
1 43	0 4236	0 9236	0 0764	1 94	0.4738	0 9738	0 0262
1 44	0 4251	0 9251	0 0749	1 95	0 4744	0 9744	0 0256
1 45	0 4265	0 9265	0 0735	1 96	0 4750	0 9750	0 0250
1 46	0.4279	0 9279	0 0721	1 97	0 4756	0 9756	0 0244
1 47	0 4292	0 9292	0 0708	1 98	0 4761	0 9761	0 0239
1 48	0.4306	0.9306	0 0694	1 99	0 4767	0 9767	0 0233
1 49	0 4319	0 9319	0 0681	2 00	0 4772	0 9772	0 0228
1 50	0 4332	0 9332	0 0668	2 01	0 4778	0 9778	0 0222
1 51	0.4345	0.9345	0 0655	2 02	0 4783	0 9783	0 0217
1 52	0.4357	0 9357	0 0643	2 03	0 4788	0 9788	0 0212

Appendix: Probabilities associated with the standard normal distribution (z) continued

z	Mean to z	Larger portion	Smaller portion	z	Mean to z	Larger portion	Smaller portion
2 04	0 4793	0 9793	0 0207	2 55	0 4946	0 9946	0.0054
2 05	0 4798	0 9798	0 0202	2 56	0 4948	0 9948	0 0052
2 06	0 4803	0.9803	0 0197	2 57	0 4949	0 9949	0 0051
2 07	0 4808	0 9808	0 0192	2 58	0 4951	0 9951	0 0049
2 08	0 4812	0 9812	0 0188	2 59	0 4952	0 9952	0 0048
2 09	0.4817	0 9817	0.0183	2 60	0 4953	0 9953	0 0047
2 10	0 4821	0 9821	0 0179	2 61	0 4955	0.9955	0 0045
2 11	0 4826	0 9826	0.0174	2 62	0.4956	0.9956	0 0044
2 12	0.4830	0 9830	0 0170	2 63	0 4957	0 9957	0 0043
2 13	0.4834	0 9834	0 0166	2 64	0.4959	0.9959	0.0041
2 14	0 4838	0 9838	0 0162	2 65	0 4960	0 9960	0 0040
2.15	0.4842	0.9842	0 0158	2 66	0 4961	0 9961	0 0039
2 16	0 4846	0 9846	0 0154	2 67	0 4962	0 9962	0 0038
2 17	0 4850	0.9850	0 0150	2.68	0.4963	0 9963	0 0037
2 18	0 4854	0 9854	0 0146	2 69	0 4964	0 9964	0 0036
2 19	0.4857	0 9857	0 0143	2 70	0 4965	0 9965	0 0035
2.20	0 4861	0 9861	0 0139	2.71	0 4966	0 9966	0 0034
2 21	0 4864	0 9864	0 0136	2 72	0 4967	0 9967	0 0033
2 22	0 4868	0 9868	0 0132	2 73	0 4968	0 9968	0 0032
2 23	0 4871	0 9871	0 0129	2 74	0 4969	0 9969	0 0031
2 24	0 4875	0 9875	0 0125	2 75	0 4970	0 9970	0 0030
2 25	0 4878	0.9878	0.0122	2.76	0 4971	0 9971	0 0029
2 26	0 4881	0 9881	0 0119	2.77	0 4972	0 9972	0 0028
2 27	0.4884	0 9884	0 0116	2.78	0.4973	0.9973	0.0027
2 28	0 4887	0 9887	0 0113	2.79	0 4974	0 9974	0 0026
2 29	0 4890	0.9890	0.0110	2.80	0 4974	0 9974	0 0026
2 30	0 4893	0 9893	0 0107	2.81	0 4975	0 9975	0 0025
2 31	0 4896	0.9896	0.0104	2.82	0 4976	0.9976	0 0024
2 32	0 4898	0 9898	0 0102	2.83	0 4977	0 9977	0 0023
2 33	0 4901	0 9901	0 0099	2 84	0 4977	0 9977	0 0023
2 34	0 4904	0 9904	0 0096	2.85	0 4978	0 9978	0 0022
2 35	0 4906	0 9906	0 0094	2 86	0 4979	0 9979	0 0021
2 36	0 4909	0 9909	0 0091	2 87	0.4979	0 9979	0 0021
2 37	0 4911	0 9911	0 0089	2 88	0 4980	0 9980	0 0020
2 38	0.4913	0 9913	0 0087	2 89	0 4981	0.9981	0 0019
2 39	0 4916	0 9916	0 0084	2 90	0 4981	0 9981	0 0019
2.40	0 4918	0 9918	0.0082	2 91	0 4982	0 9982	0 0018
2 41	0 4920	0 9920	0.0080	2 92	0 4982	0.9982	0 0018
2 42	0 4922	0 9922	0 0078	2 93	0.4983	0 9983	0 0017
2 43	0 4925	0 9925	0 0075	2.94	0.4984	0.9984	0 0016
2 44	0 4927	0 9927	0 0073	2 95	0 4984	0 9984	0 0016
2 45	0 4929	0.9929	0 0071	2 96	0 4985	0 9985	0 0015
2 46	0 4931	0 9931	0 0069	2 97	0 4985	0 9985	0 0015
2 47	0.4932	0.9932	0.0068	2 98	0 4986	0.9986	0 0014
2 48	0.4934	0.9934	0 0066	2 99	0 4986	0 9986	0.0014
2 49	0 4936	0 9936	0 0064	3 00	0 4987	0 9987	0 0013
2 50	0.4938	0.9938	0 0062	3 01	0 4987	0 9987	0 0013
2 51	0.4940	0.9940	0 0060	3 02	0 4987	0 9987	0.0013
2 52	0 4941	0 9941	0 0059	3 03	0 4988	0 9988	0.0012
2.53	0.4943	0 9943	0 0057	3 04	0 4988	0.9988	0 0012
2.54	0 4945	0 9945	0 0055	3 05	0 4989	0.9989	0 0011

Appendix. Probabilities associated with the standard normal distribution (z) continued

z	Mean to z	Larger portion	Smaller portion	z	Mean to z	Larger portion	Smaller portion
3 06	0 4989	0 9989	0 0011	3 19	0.4993	0 9993	0.0007
3 07	0 4989	0.9989	0.0011	3 20	0 4993	0 9993	0 0007
3 08	0 4990	0 9990	0 0010	3 21	0 4993	0 9993	0.0007
3 09	0 4990	0 9990	0 0010	3 22	0 4994	0 9994	0 0006
3 10	0 4990	0.9990	0 0010	3 23	0 4994	0 9994	0 0006
3 11	0 4991	0 9991	0 0009	3.24	0 4994	0 9994	0 0006
3 12	0 4991	0 9991	0 0009	3 25	0 4994	0 9994	0 0006
3 13	0 4991	0 9991	0 0009				
3 14	0 4992	0 9992	0.0008	3 50	0 4998	0 9998	0 0002
3 15	0 4992	0 9992	0 0008		..		
3 16	0 4992	0 9992	0 0008	3 75	0 4999	0 9999	0.0001
3.17	0.4992	0 9992	0 0008				
3 18	0 4993	0 9993	0 0007	4 00	0 5000	1 000	0 0000

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PART 1 (GENERAL/ALGEMEEN) DEEL 1

1 STUDY UNIT e g PSY100 X
STUDIE EENHEID bv PSY100 X

2 PAPER NUMBER
VRAESTELNOMMER

3 INITIALS AND SURNAME
VOORLETTERS EN VAN

4 DATE OF EXAMINATION
DATUM VAN EKSAMEN

5 EXAMINATION CENTRE (E G PRETORIA)
EKSAMENSENTRUM (BV PRETORIA)

6 STUDENT NUMBER
STUDENTENOMMER

7

8 UNIQUE PAPER NO
UNIEKE VRAESTEL NR

9

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1 GEBRUIK SLEGS N HB POTLOOD OM HIERDIE BLAD TE VOLTOOI
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4 VUL U STUDENTENOMMER VAN LINKS NA REGS IN
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6 KONTROLEER DAT DIE UNIEKE NOMMER REG INGEVUL IS
7 MAAK SEKER DAT NET EEN ALTERNATIEF PER VRAAG GEMERK IS
8 MOENIE VOU NIE

PART 2 (ANSWERS/ANTWOORDE) DEEL 2

10

1	36	71	106
2	37	72	107
3	38	73	108
4	39	74	109
5	40	75	110
6	41	76	111
7	42	77	112
8	43	78	113
9	44	79	114
10	45	80	115
11	46	81	116
12	47	82	117
13	48	83	118
14	49	84	119
15	50	85	120
16	51	86	121
17	52	87	122
18	53	88	123
19	54	89	124
20	55	90	125
21	56	91	126
22	57	92	127
23	58	93	128
24	59	94	129
25	60	95	130
26	61	96	131
27	62	97	132
28	63	98	133
29	64	99	134
30	65	100	135
31	66	101	136
32	67	102	137
33	68	103	138
34	69	104	139
35	70	105	140

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❶ Write your paper code in these eight squares, for instance

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❸ Fill in your initials and surname

❹ Fill in the date of the examination

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❻ WRITE the digits of your student number HORIZONTALLY (from left to right) Begin by filling in the first digit of your student number in the first square on the left, then fill in the other digits, each one in a separate square

❼ In each vertical column mark the digit that corresponds to the digit in your student number as follows [-]

❽ WRITE your unique paper number HORIZONTALLY
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❾ In each vertical column mark the digit that corresponds to the digit number in your unique paper number as follows [-]

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