SECTION A

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

Question 1

The principal aim of psychological research is to - - - - - about human behaviour.

1. conduct experiments
2. collect and analyse data
3. develop theories

Question 2

In the case of a correlational design, the aim is to - - - - -.

1. compare a sample to the population
2. correlate two samples with one another
3. select a single sample and obtain measurements on the variables

Question 3

A psychologist is interested in studying the interaction between small groups of four to five people each. He makes the assumption that the interaction between such groups may be likened to the way in which governments interact with one another. 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) scientific (b) experimental (c) concept
2. (a) experimental (b) research (c) operational concept
3. (a) research (b) operational (c) construct

Consider the following scenario for questions 4 and 5

A researcher conducts an experiment with two groups of university students. The students in the first group are all given 125 ml. of alcohol to drink, while the students in the second group are required to drink 350 ml of alcohol each. She then tests their memory span in a series of psychometric tests and finds that the subjects in the second group have a significantly shorter memory span than the subjects in the first group.

Question 4

The most appropriate formulation of the researcher's research hypothesis is:

1. A study of the memory span among students.
2. Comparing two groups on alcohol consumption.
3. The effect of alcohol consumption on memory span.

Question 5

The dependent variable in the study above is:

1. alcohol consumption
2. memory span
3. university students

Question 6

Select the correct notation from the options below for the statement: The probability value is larger than ½.

1. $p \geq 0,05$
2. $p < 0,05$
3. $p > 0,5$

Question 7

A psychologist conducts a study in which she measures the reaction times of students doing a psychometric test. She proceeds from the assumption that reaction time correlates with intelligence. In this study "intelligence" is the - - - - -.

1. indicator
2. latent variable
3. manifest variable

Question 8

Operational definitions of a concept are definitions which define a concept in terms of - - - - -.

1. other concepts
2. observable instances
3. latent variables

Question 9

A researcher studies the relationship between gender and salary in a single selected random sample of employees of a computer company. The study is a (a) - - - - - design, because it (b) - - - - -.

1. (a) group (b) compares two samples in a population
2. (a) correlational (b) correlates two samples with one another
3. (a) correlational (b) studies the correlation between two variables

Use the following scenario to answer **Questions 10 to 13**:

"My explanation of acute stress disorder indicates how the intensity of stress is affected by patients' anxiety proneness, whether or not they received psychotherapy, and the nature of the traumatic stressor. My research will investigate whether such patients' level of anxiety is actually reduced by psychotherapy. More specifically, patients receiving therapy are expected to score lower on the Manifest Anxiety Scale than patients not receiving therapy."

Question 10

"My explanation of acute stress disorder" is a - - - - -.

1. scientific hypothesis
2. theory
3. postulated relation between two constructs

Question 11

"Patients' level of anxiety is reduced by psychotherapy" is - - - - -.

1. an observed relation between two variables
2. a theoretical hypothesis
3. an operational hypothesis

Question 12

When interpreting the results of this research I will assume that anxiety proneness and the nature of the traumatic stressor - - - - -.

1. do affect level of anxiety, but their effects more or less cancel out over all my patients
2. do not affect level of anxiety
3. do affect level of anxiety, but according to the central limit theorem their average effect will be zero

Question 13

"Patients receiving psychotherapy are expected to score lower on the Manifest Anxiety Scale than patients not receiving psychotherapy" is - - - - -.

1. a statistical hypothesis
2. a theoretical hypothesis
3. an experimental hypothesis

Question 14

A college student claims that he can identify three different types of cheese by taste. An experiment is set up to test his ability. He is blindfolded and given three pieces of cheese, each representing a different brand. What is the probability that he will correctly identify all three brands of cheese purely by chance after tasting them all?

1. 0,25
2. 0,16
3. 0,33

Question 15

John received 25 marks for his psychology test. The average mark for this test is 35, and the standard deviation 10. What proportion of the students received higher marks than John?

1. 0,16
2. 0,84
3. 0,34

Question 16

Which of the following does **NOT** represent a probability?

1. 99%
2. 0,5
3. -0,63

Question 17

A frequency distribution of the ages in months of a class of Grade 1 children indicates for each - - - - - what the corresponding - - - - - is.

1. frequency; age in months
2. age in months; number of children of that age
3. age in months; relative frequency at that age

Question 18

What test score corresponds to a Z score of -2 if the mean and standard deviation of the scores are 5 and 2 respectively.

1. 1
2. 3
3. 9

Question 19

Consider the following Table:

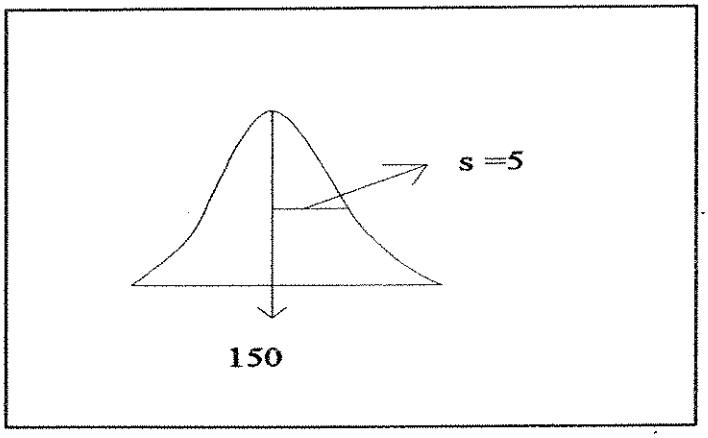
Subject	Student X's mark	Mean of class	Standard deviation of class
A	50%	55%	5%
B	55%	50%	10%
C	60%	50%	5%
D	65%	65%	5%

In which subject did Student X do best, relative to his class?

1. A
2. C
3. D

Question 20

Consider the following drawing of the normal curve:



What is the size of the area under the curve, to the left side of the average?

1. 0,3
2. 0,5
3. 0,64

Use the following scenario to answer **Questions 21 to 22**:

Ross' explanation of size perception in the natural environment indicates how the estimated size of a distant object is affected by its true size, distance from the observer, and transparancy of the atmosphere. He decides to investigate whether estimated size increases with haziness.

Question 21

"Estimated size increases with haziness" is - - - - -.

1. an observed relation between two variables
2. a research hypothesis
3. an operational definition

Question 22

The dependent variable(s) in Ross' research is/are - - - - -.

1. true size, distance from the observer, and transparancy of the atmosphere
2. haziness
3. estimated size

Question 23

The independent variable in Ross' research is - - - - -.

1. haziness
2. estimated size
3. size perception in the natural environment

Question 24

Suppose that over the years 10 000 students wrote the examinations in PYC 304-C and that 6000 of them passed, of which 300 obtained exactly 50%. This means that for randomly selected students the probability of obtaining exactly 50% is - - - - - while the probability of obtaining 50% or more is - - - - -.

1. 0,60; 0,03
2. 0,05; 0,60
3. 0,03; 0,60

Question 25

Suppose the height of military recruits is distributed normally with a mean of 1750mm and a standard deviation of 50mm. Drawing repeated samples of 25 recruits we expect the standard deviation of the distribution of samples to be about - - - - -.

1. 2
2. 10
3. 50

Question 26

The p-value depends on - - - - -.

1. the value of the standard error
2. the value of the test statistic
3. the null hypothesis statement

Question 27

The null hypothesis is rejected if - - - - -.

1. the p-value under H_0 is smaller than the level of significance
2. the p-value under H_1 is larger than the level of significance
3. the p-value is smaller than 0,05 or 0,01

Question 28

Which one of the following alternative hypotheses requires a one-tailed test of significance?

1. The mean anxiety score for boys differs from the mean score for girls
2. The mean verbal ability score for boys is lower than the mean score for girls
3. The correlation between test marks and examination marks is not the same for boys and girls.

Questions 29

The larger the $z_{\bar{x}}$ -test statistic value for a sample of a particular size, the smaller the p-value will become - - - - -.

1. as the differences between means becomes larger
2. irrespective of the differences between the means
3. as the standard error becomes smaller

Question 30

Suppose a researcher selects a single sample of students and is interested in the proportion of students who prefers quantitative research over qualitative research. The population parameters of interest is - - - - -, while the sample statistic is - - - - -.

1. P ; p
2. p ; P
3. P ; z_p

Question 31

Consider the following statistical hypothesis:

$H_0: \mu = 120$
$H_1: \mu > 120$

If s = 25 and n = 64, what is the vale of $s_{\bar{x}}$?

1. $\frac{5}{8}$
2. $\frac{25}{\sqrt{64}}$
3. $\frac{25}{64}$

Question 32

A researcher wants to test the hypothesis that boys are generally more aggressive than girls. He draws a sample of 100 boys and a sample of 100 girls, and gives each child a test that measures their general level of aggression. Which would be the most appropriate statistical test to use, out of the following?

1. The t-test for independent samples
2. The chi-square test
3. The t-test for dependent samples

Question 33

A researcher wants to know whether there is a greater proportion of female Unisa students who are enrolled for modules in the social sciences than the proportion of male Unisa students. Which of the following is the most appropriate test statistic to use?

1. the t-test statistic for independent samples (t_C)
2. the z-test statistic (z_C)
3. the chi-square test statistic (χ^2)

Question 34

The difference score ($d = X_2 - X_1$) is used in the calculation of the t-test statistic in the case of - - - - -.

1. dependent samples
2. independent samples
3. both of the above

Question 35

When a statistical test yields a large p-value, which of the following statements is most correct?

1. The alternative hypothesis is probably true
2. The null hypothesis is probably false
3. The null hypothesis is probably true

Question 36

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 0,0026
3. is 0,0013

Question 37

When applying a z-test to compare a sample mean to a known population mean, what do we call the calculated z-value?

1. A test statistic
2. A sample statistic
3. A population parameter

Question 38

When applying a z-test to compare a sample mean to a known population mean, the p-value represents the probability of - - - - -.

1. correctly rejecting the null hypothesis
2. obtaining the sample mean under the alternative hypothesis
3. obtaining the sample mean under the null hypothesis

Question 39

Which statement is true of the level of significance of a statistical test.

1. It is based on the p-value of the test statistic.
2. It is often selected in advance by the researcher.
3. It is the probability of obtaining the sample statistic under the null hypothesis.

Question 40

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

1. accept
2. do not reject
3. reject

Question 41

The lower we set the level of significance, the greater the probability of - - - - -.

1. rejecting the null hypothesis
2. a type I error
3. a type II error

Question 42

You wish to test the hypothesis that the majority of persons aged 70 years or more are females. Using registers of pensioners you obtain a random sample of 250 persons aged 70 or more and find that 150 of them are female.

Which are the appropriate statistical hypotheses for the analysis of your result?

1. H_0: P equals 0,5; H_1: P is larger that 0,5
2. H_0: μ equals 70; H_1: μ is larger than 70
3. H_0: P equals 0,5; H_1: P is not equal to 0,5

Question 43

When two population means are compared, the p-value expresses - - - - -.

1. the chance that a difference found between the means is due to sampling error
2. the chance that a difference found between the means is due to H_1
3. the probability that a difference will be found between the means

Question 44

A failure to reject H_0 implies that a difference between the calculated sample mean and its expected value under H_0 is due to - - - - -.

1. the dependent variable
2. the independent variable
3. chance

Question 45

The level of significance is like a - - - - -.

1. p-value under H_0
2. p-value under H_1
3. p-value from the z-tables

Question 46

When a statistical test yields a small p-value, which of the following statements is most correct?

1. The alternative hypothesis is probably false.
2. The null hypothesis is probably true.
3. The null hypothesis is probably false.

Question 47

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

1. accept
2. reject
3. fail to reject

Question 48

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

1. sets a low level of significance.
2. uses a large sample.
3. reduces the probability of a type I error.

Base your answers to **Questions 49 and 50** on the following scenario:

You flip a coin 25 times, obtaining "heads" 15 times, and wish to test statistically whether the coin might be biased.

Question 49

What is the appropriate population proportion under the null hypothesis?

1. 0,5
2. 0,6
3. 1,0

Question 50

What is the Zp value?

1. 0,1
2. 0,2
3. 1,0

Question 51

A researcher plans to use the t-test to compare two independent samples of data of only 15 individuals each. What minimum assumption needs to be met before she may proceed?

1. The sample standard deviations have to be equal
2. The data from both samples has to come from populations that are normally distributed
3. Both of the above

Question 52

In which of the following cases can the scores on two variables be regarded as independent ?

1. The variables represent exam scores of children from two schools, matched on demographic criteria like grade, gender and age
2. The variables represent scores from subjects on a motivational scale, who were tested before and after listening to a presentation by a motivational speaker
3. The scores on neither of the above examples may be regarded as independent

Question 53

Which of the following assumptions underlies the calculation of the test statistic?

1. The population standard deviation is known.
2. The two populations have different means.
3. The two populations have the same variance.

Question 54

A teacher investigates the effect of extra classes on the performance of pupils in mathematics. A group of 20 pupils receives the extra classes while a control group of 20 pupils receives singing lessons. For each of the 40 pupils the teacher calculates the increase or decrease in his or her mathematics performance from an examination before the extra classes to an examination after the extra classes.

Which research design should the teacher use?

1. A single-sample groups design.
2. A two-sample groups design.
3. A four-sample groups design.

Question 55

As the sample size (n) increases - - - - -.

1. a smaller value of the Pearson correlation coefficient r will reach significance
2. a larger value of the Pearson correlation coefficient r is required before the result will be significant
3. there are no implications for the significance of the value of the Pearson correlation coefficient r

Question 56

A researcher predicts that a motivational talk will improve the work performance of men. However, he finds that the mean work performance of his sample of 20 men is actually poorer after the motivational talk than before. What statistical test is required to analyse his/her results?

1. A one-tailed statistical test is required.
2. A two-tailed statistical test is required.
3. No statistical test is required

Question 57

A researcher is comparing the following hypotheses:

H_0: $\mu_1 = \mu_2$
H_1: $\mu_1 > \mu_2$

Her results derived from a random sample shows that the mean sample score for the first group is less than the mean sample score for group two (i.e., $\bar{x}_1 < \bar{x}_2$). What may she conclude?

1. She needs to calculate the relevant p-value before making a conclusion.
2. She can reject H_0.
3. She cannot reject H_0.

Question 58

The z_C statistic for comparing proportions should be used - - - - -.

1. for comparing proportions in two samples from populations that are dependent
2. for comparing proportions in two samples from populations that are independent
3. irrespective of whether the data comes from dependent or independent populations

Question 59

The probability under the null hypothesis of obtaining a t-value of 2,5 or higher in the case of a one-tailed test is - - - - - that for a two-tailed test.

1. the same as
2. twice
3. half

Question 60

A researcher hypothesizes that general intelligence underlies students' performance in both history and mathematics. He investigates this idea by tabulating for each of his students whether they (a) passed or failed their last history examination, and (b) passed or failed their last mathematics examination. Which research design is he using?

1. A correlational design
2. A two-sample groups design
3. A one-sample groups design

Question 61

Which of the following statements about the relationship between the value of the t-test statistic and the probability value p is true, if the sample size n remains constant?

1. The larger the value of the t-test statistic, the smaller p will be.
2. The smaller the value of the t-test statistic, the smaller p will be.
3. There is no relationship between p and the t-test statistic.

Question 62

A politician asks his audience of 100 whether they will vote for him. Of the 60 men present, 33 say yes; of the 40 women present, 18 say yes.

The observed sample statistic for the males is - - - - - while it is - - - - - for the females.

1. 0,60; 0,40
2. 33; 18
3. 0,55; 0,45

Question 63

Which is the appropriate test statistic to use to determine whether a linear relationship exists between two random variables?

1. t-test
2. chi-square test
3. Pearson's r test statistic

Question 64

Which of the following does **not** represent a valid value for a Pearson's r:

1. 0,00
2. -1,00
3. 10,00

Question 65

A positive correlation between variables X and Y implies that persons scoring low on X will generally score - - - - - on Y.

1. high
2. low
3. either high or low

Question 66

A researcher finds that the correlation coefficient between the ages and heights of a sample of 10 children is positive, but not significantly different from zero at the 0,05 level of significance. To improve her chances of obtaining a significant correlation between these variables the researcher could repeat the research using - - - - -.

1. more variables
2. more children
3. a lower level of significance

Question 67

A politician asks his audience of 100 whether they will vote for him. Of the 60 men present 33 say yes; of the 40 women present 18 say yes. When analysing these results the two sets of answers should be regarded as - - - - -.

1. coming from the same population
2. independent
3. having been randomly assigned to the two groups

Question 68

A researcher wants to establish whether the type of employment category that is filled by employees of a particular company (manager, middle manager, clerical worker, technical worker) is at all influenced by their gender (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.

Question 69

What is the expected frequency in cell AX of the following contingency table?

	X	Y
A	7	3
B	3	7

1. 3
2. 5
3. 7

Question 70

The chi-square (χ^2) test statistic is used to compare - - - - -.

1. the frequency distribution of observed data with the frequency distribution of the data that is expected if the null hypothesis is true
2. the variance of observed data with the variance of the data as expected if the null hypothesis is true
3. the covariance of two variables X and Y with the square root of the product (multiplication) of their respective variances

[TOTAL: 70]

END OF EXAM PAPER

NB: Your mark out of 70 will be converted to a percentage (100 marks) by the computer.