SECTION A

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

Question 1

Which statement about the aims of psychological research is most accurate?

1. It is primarily aimed at gathering facts.
2. It is mainly used to develop research hypotheses.
3. It's goal is to test psychological theories.

Question 2

Select the most appropriate definition of a psychological theory:

1. Psychological theories are sets of observations about human nature.
2. Psychological theories are best defined as statements about the principles underlying human behaviour, but these statements are not testable.
3. Psychological theories make predictions about relations between variables.

Question 3

A psychologist is conducting a study about the self-concepts of university students. He makes the assumption that students' concepts of themselves can be used to predict their willingness to participate in class discussions. 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 "self-concept".

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

The (a) - - - - - variable can be said to "be caused by" the (b) - - - - - variable.

1. (a) dependent (b) independent
2. (a) operational (b) measured
3. (a) independent (b) dependent

Question 7

A psychologist conducts a study in which she measures the reaction times of a team of soccer players using a psychometric test. She proceeds from the assumption that reaction time correlates with athletic ability. In this study 'athletic ability' is the - - - - -.

1. indicator
2. latent variable
3. manifest variable

Question 8

Operational definitions enable us to - - - - -.

(a) make observations of constructs
(b) link constructs to observable phenomena

1. (a) but not (b)
2. (b) but not (a)
3. (a) and (b)

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

Question 10

In a study, the relationship between level of physiological arousal (high and low) and mood (measured on three levels) is considered. A suitable hypothesis for the study can be viewed as a - - - - -.

1. rule associating the values of 'physiological arousal' with the values of 'mood'
2. correlation between the constants 'physiological arousal' and 'mood'
3. rule correlating the values of the variable 'physiological arousal'.

Question 11

Consider the hypothesis:

There is a correlation between self-esteem and eating disorders. People with low self-esteem are more likely to have eating disorders because they tend to eat less healthy than people with high self-esteem.

Letting μ_{hs} represent the average "healthy" eating pattern of people with high self-esteem and μ_{ls} the average "healthy" eating pattern of people with low self-esteem, the above hypothesis states that - - - - -.

1. $\mu_{hs} \geq \mu_{ls}$
2. $\mu_{hs} > \mu_{ls}$
3. $\mu_{hs} < \mu_{ls}$

Question 12

Assume that a researcher believes that education plays a role in promotion. Which one of the following is the most appropriate operational hypothesis?

1. Education plays a role in deciding on the promotion of employees at Computer Solutions Inc.
2. Employees with higher levels of education earn more than employees with lower levels of education at Computer Solutions Inc.
3. Employees with higher levels of education are more likely to be promoted at Computer Solutions Inc. than employees with lower education at corresponding post levels.

Question 13

A standard normal distribution has a standard deviation of - - - - - and a mean of - - - - -.

1. 0; 1
2. 1; 0
3. 1;1

Question 14

In a population there are 450 people of whom 150 do not smoke. What is the probability of randomly selecting a smoker from this population?

1. 0,67
2. 0,33
3. 0,5

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 statements about population parameters is the most accurate?

1. They are essential for making statements about probability.
2. They are always unknown but appropriate values can be estimated prior to sampling.
3. They are essential, but cannot be estimated from sample information.

Question 17

Z scores are used in psychological research to - - - - -.

1. compare scores on tests with different means and standard deviations
2. transform scores on tests with different means and standard deviations into comparable percentages
3. determine whether scores are normally distributed.

Question 18

Why is the central limit theorem of importance in inferential statistics?

1. Because it informs us how sampling error will increase as the population increases
2. Because it tells us that sampling error will begin to approximate a normal distribution as samples grow larger
3. Because it shows that the sampling distribution of certain sampling statistics will approach a normal distribution as sample sizes increase.

Question 19

Consider the following Table:

Subject	Student X	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 22

If you select one marble randomly from a bag containing 18 red , 17 blue, and 12 green marbles, what is the probability of the marble being green?

1. 0,26
2. 0,38
3. 0,36

Question 23

The sampling error associated with a specific sample drawn from a population can be estimated in terms of:

1. the sample size
2. the population size
3. the population mean

Question 24

Select the correct notation from the options below for the statement: The probability value is smaller or equal to ½.

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

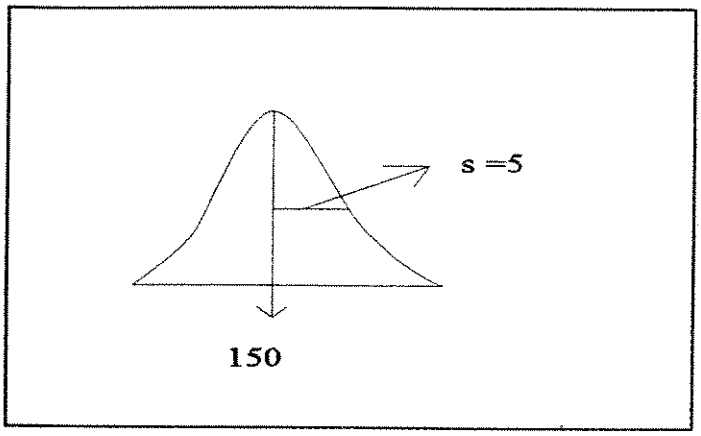
Question 25

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

1. the curve is symmetrical
2. the endpoints of the curve never touch the X-axis
3. the curve has a standardised variance

Question 20

Study the following figure of the normal curve:

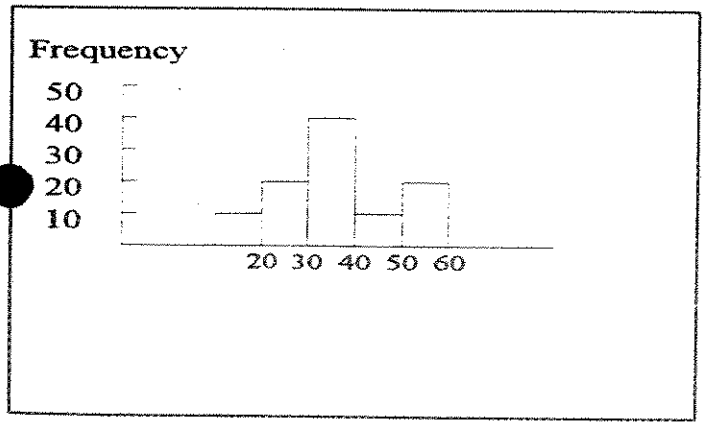


What is the size of the area under the curve, to the left side of the average?

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

Question 21

Study the histogram below of the exam marks of a group of students in the same class. Note that the values on the horisontal axis are the upper class limits.



Assume we use this histogram as a basis for making probability predictions. What is the probability that a student's score will be between 50 and 60?

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

Questions 26 to 29 are based on the following case:

Peter is a human resource consultant and his boss asks him to test the workers in their company (representative of population A, say) and to determine if their attitude towards workers with AIDS differ from that of the general worker in South Africa (population B). Suppose that on the basis of previous studies it is accepted that the mean attitude score of the population of workers in South Africa is 55 (the higher the score the more positive) and that the standard deviation is 16.

Question 26

Which of the following statements translates the research hypothesis into the correct *statistical hypotheses*?

1. H_0: $\mu = 55$
   H_1: $\mu < 55$

2. H_0: $\mu = 55$
   H_1: $\mu > 55$

3. H_0: $\mu = 55$
   H_1: $\mu \neq 55$

Question 27

Peter now wants to set up his sample data. Which of the following procedures should he follow?

He should draw - - - - -.

1. a random sample from both population A and B
2. a random sample from population A
3. two random samples from population A

Question 28

Peter finds that the workers in his company have a mean attitude score of 50. What statistical test procedure should be performed?

1. A t-test of a single sample mean
2. A z-test of a single sample mean
3. A t-test of two sample means

Question 29

Suppose Peter selects a random sample of 91 workers from his company. What is the value of the standard error of the mean?

1. $\frac{16}{\sqrt{91}}$
2. $\frac{16}{91}$
3. $\frac{4}{9}$

Question 30

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 31

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 32

The size of the level of significance depends on - - - - -.

1. a random choice by the researcher
2. a definite value determined by the researcher
3. the p-value under H_0

Question 33

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

1. the probability of the difference between the sample means given that H_0 is true
2. the probability of the difference between the sample means given that H_1 is true
3. the probability of the difference between the sample means given that H_0 is false

Question 34

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

1. the z-tables
2. the size of the test statistic
3. the null hypothesis statement

Question 35

The null hypothesis is ***not*** rejected if - - - - -.

1. the p-value under H_0 is ***not*** 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 ***not*** smaller than 0,05 or 0;01

Question 36

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

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

Question 37

The larger the t_x-test statistic value for a sample of a particular size the - - - - -.

1. smaller the p-value will be
2. larger the p-value will be
3. smaller the level of significance will be

Question 38

Suppose the alternative hypothesis states that the population mean is larger than 60. The researcher should test H_0 against H_1 if - - - - -.

1. the sample mean is larger than 60
2. the sample mean is larger or smaller than 60
3. the p-value is smaller than the level of significance

Question 39

Consider the following statistical hypotheses:

$H_0 : \mu = 60$
$H_1 : \mu \neq 60$

Suppose the one-tailed p-value is 0,0345 and the level of significance is set at 0,05. The sample mean was found to be 65. What is the value of the two-tailed or non-directional p-value?

1. 0,10
2. 0,0173
3. 0,0690

Question 40

Suppose the level of significance is set at 0,05, and the appropriate p-value is calculated as 0,04. What is the probability that the researcher will be making a Type I error?

1. 0,04
2. 0,05
3. Normally not possible to estimate

Question 41

Suppose the null hypothesis is rejected. What should the decision regarding H_1 be?

1. Accept H_1
2. Accept H_1 only if the p-value is small enough
3. Accept H_1 only if the result is in the correct direction

Question 42

Which of the following refers to the probability of making a Type II error?

1. Significance level
2. Beta or β
3. *p*- value

Question 43

Suppose we want to limit the risk of a Type I error. What can we do?

1. Increase the sample size
2. Decrease sampling error, measurement error, etc.
3. Set a smaller level of significance

Question 44

Suppose you find that the value of a t-test statistic calculated for your research results is 3,0 and the appropriate p-value 0,02. Which conclusion is appropriate?

1. Reject the null hypothesis if the level of significance was set at 0,05
2. Do not reject the null hypothesis if the level of significance was set at 0,05
3. Reject the alternative hypothesis if the level of significance was set at at 0,05

Question 45

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

1. The sample result is more probable under the alternative hypothesis
2. The null hypothesis explains the sample result
3. The alternative hypothesis should be rejected

Question 46

Suppose the appropriate p-value of a test statistic is 0,03. What decision should the researcher make?

1. Reject H_0 if the level of significance was set in advance at 0,01
2. Since p = 0,03, set the level of significance at 0,05
3. Reject H_0 if the level of significance was set in advance at 0,04

Question 47

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

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

Question 48

Consider the following statistical hypothesis:

$H_0 : P = 0,7$
$H_1 : P < 0,7$

If the sample proportion is found to be 0,6, the sample size is 21 and the z_p value is -1,0, what is the p-value?

1. 0,84
2. 0,16
3. 0,32

Question 49

Susan stated the following hypothesis:

$H_0 : \mu = 100$
$H_1 : \mu > 100$

She drew a random sample of 50 persons. Given that the *null hypothesis is false*, what can Susan expect the mean of the sample to be?

1. Less than 100
2. Some value different from 100
3. More than 100

Question 50

Suppose H_0: $\mu = 100$ is tested against $H_1 : \mu \neq 100$ at the 0,10 level of significance. If the t-statistic is -3,20 and the two-tailed p-value is 0,11, what decision regarding the statistical hypothesis should be taken?

1. Reject H_0 and accept H_1 at the 0,10 level of significance
2. Reject H_1 and accept H_0 at the 0,11 level of significance
3. Do not reject H_0 at the 0,10 level of significance

Question 51

A researcher wants to compare the level of job satisfaction of office workers with that of technical staff at a large company. He draws a random sample of 75 office workers and 75 technical workers and measures the level of job satisfaction of each subject on an appropriate scale. Which of the following would be the most appropriate statistical test to use to compare the two populations with regard to their mean levels of job satisfaction?

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

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 are necessary for a two-sample t-test if the samples are relatively small (about 15 individuals in each of two samples).

1. the sample standard deviations are equal and the distributions are unknown
2. the data from both samples come from populations that are normally distributed and no information is available about the standard deviations
3. the data from both samples come from populations that are normally distributed and the sample standard deviations are equal

Question 54

A researcher wants to compare the percentage of persons from urban areas who have been victims of crime with the percentage of crime victims from rural areas in a two-group design. Which of the following is the most appropriate test statistic to use?

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

Question 55

Samples can be considered independent when - - - - -.

1. the composition of one sample is not systematically related to the composition of the other one
2. care was taken that the samples are drawn under different experimental conditions
3 the samples are drawn from more than a single population of subjects

Question 56

The difference score indicating differences between each pair of results in two samples ($d = X_2 - X_1$) is used in the calculation of the test statistic in the case of - - - - -.

1. the t-test for independent samples
2. the t-test for dependent samples
3. the Pearson correlation coefficient

Question 57

A researcher suspects that social phobia is more common among females than among males. She wants to test this by comparing the following hypotheses:

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

where μ_1 indicates the average level of social phobia among females in the population (group 1), as tested on a 7-point scale, and μ_2 is the average level of social phobia among males in the population (group 2). She draws random samples of females and males respectively, and gets the following average levels of social phobia scores for each group:

Females: $\bar{x}_1 = 4,1$; Males: $\bar{x}_2 = 4,8$

What may she conclude?

1. H_0 can be rejected
2. H_0 cannot be rejected
3. the relevant t-statistic and p-value must be calculated before making a conclusion

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

A researcher wants to determine whether the level of academic accomplishment that a student has reached has any effect on the way that he or she approaches problem solving. To do this, she plans to compare a group of undergraduate students with a group of postgraduate students on a test that measures problem-solving style. Which is the dependent variable?

1. problem-solving style
2. graduate category
3. whether the subject is a student or not

Question 60

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 61

A researcher wants to test the following hypotheses:

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

On the basis of data provided, the output from a computer programme indicates that a t-value of t = 1,72 was found, with the p-value for a two-tailed test given as p=0,056. What should the researcher do to evaluate this result?

1. Divide 0,056 by 2 before comparing it with the pre-selected alpha level (α)
2. Multiply 0,056 by 2 before comparing it with the pre-selected alpha level (α)
3. Compare the computed p-value as given with the pre-selected alpha level (α)

Question 62

The use of the t-test to compare the means of data from two samples is appropriate when - - - - -.

(a) the samples come from populations that are normally distributed
(b) the sample sizes are large

1. (b) but not (a)
2. (a) but not (b)
3. (a) or (b)

Question 63

A researcher wants to establish whether a relationship exists between people's religious affiliation and whether they are in favour of or against the death penalty. Which of the following 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 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 Pearson correlation of r = 0,23 is found. What kind of relationship between two variables X and Y does this represent?

1. As one variable grows smaller, so does the other get smaller
2. As one variable grows larger, the other gets smaller
3. The correlation is too small to indicate an actual relationship

Question 66

For a smaller sample size (n) - - - - -.

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

Question 67

A researcher wants to determine whether a relationship exists between students' general level of anxiety and their exam results. He presents each student from a random sample with a general anxiety scale just before they are to write an important exam. Which of the following is the most appropriate test statistic to use to determine whether a relationship exists between the two variables (anxiety level and exam results)?

1. t-test
2. Pearson's r test statistic
3. chi-square test (χ^2)

Question 68

Pearson's r represents - - - - -.

1. a comparison between the observed frequencies and the frequencies expected if the null hypothesis is true, for two variables
2. the covariance of two variables X and Y compared with the square root of the product (multiplication) of their respective variances
3. the distribution of observed data compared with the distribution of data as expected if the null hypothesis is true

Question 69

What is the expected value for the bottom left cell (i.e., rural males) in the following contingency table, to be used in computing the chi-square (χ^2) test statistic?

	Male	Female	*Row total*
Urban	4	8	12
Rural	2	4	6
Column total	6	12	18

1. 4
2. 2
3. 8

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]
[GRAND TOTAL: 100]