SECTION A

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

Question 1

A masters student in psychology plans to study human consciousness, following the recent publication of Watson's theory about the nature of consciousness. The main aim of the research will probably be to empirically - - - - -

1. test predictions based on Watson's theory
2. test Watson's theory so that it can be accepted or rejected as a whole
3. study consciousness with a view to understanding, predicting and controlling it

Question 2

A theory can be described as an interdependent set of - - - - - relations between - - - - -

1. proposed; constructs
2. empirical; hypotheses
3. verified; variables

Question 3

Constructs are sometimes called - - - - -

1. indicators
2. referents
3. intervening variables

Questions 4

Which of the following best describes "latent"?

1. observable
2. manifest
3. hidden

Question 5

A measurement model of attention deficit disorder relates this - - - - - to its - - - - -

1. construct; intervening variables
2. hypothetical variable; observable instances
3. referent; manifestations

Question 6

An operational definition defines a - - - - - in terms of - - - - -

1. manifest variable; observable behaviour
2. theoretical construct; observable consequences
3. observable construct; other constructs

Question 7

Which best describes "research hypothesis"?

1. An empirically observed relation between two constructs
2. A proposed relation between two variables
3. A network of postulated relations between constructs

Use the following scenario to answer **Questions 8 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 8

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

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

Question 9

"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 10

The dependent variable(s) in my research is/are - - - - -

1. anxiety proneness, nature of the traumatic stressor, and psychotherapy
2. whether or not psychotherapy is received
3. level of anxiety experienced by patients

Question 11

The independent variable in my research is - - - - -

1. whether or not psychotherapy is received
2. level of anxiety experienced by patients
3. the intensity of stress

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 class of 10 boys and 11 girls, including Mary and her friend Elizabeth, chooses a class representative by writing their names on slips of paper, putting these into a box and asking their teacher to draw one name blindly.

What is the probability that Mary will be selected?

1. 1/11
2. 1/20
3. 1/21

Question 15

Which statement best represents an application of the law of large numbers?: If I flip a coin 1000 times it will fall heads up - - - - - 500 times.

1. approximately
2. exactly
3. at least

Question 16

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

1. 99%
2. 0
3. -0,05

Question 17

The expression "0,05 smaller than or equal to p smaller than or equal to 0,10" denotes a probability value - - - - -

1. somewhere in the range 0,05 to 0,10
2. larger than or equal to 0,10; or smaller than or equal to 0,05
3. larger than 0,05 and smaller than 0,10

Question 18

If 5000 students wrote an exam, 3000 passed with 50% or more and 250 obtained exactly 50%, what is the value of p(50%|pass) for randomly selected students?

1. 0,025
2. 1/12
3. 1

Question 19

Use the following frequency distribution of 1000 scores on a subscale of an intelligence test to answer the question.

Score (X):	11	12	13	14	15	16	17	18
Relative frequency (%):	4	11	13	22	18	17	9	6

The value of p(X larger than or equal to 18) is - - - - -

1. 0,06
2. 0
3. 94%

Question 20

During the interpretation of psychological measurements the normal distribution is - - - - -

1. adapted to fit the observed frequency distribution of scores
2. used as a theoretical model for interpreting the observed distribution of scores
3. used to calculate the relative frequency of observed scores

Question 21

The scale along the X-axis of the standard normal distribution indicates - - - - -

1. probabilities
2. the mean of the distribution
3. the number of standard deviations below and above the mean

Question 22

The area under the standard normal curve equals - - - - -

1. its mean
2. its standard deviation
3. one

Question 23

The mean and standard deviation of a set of test scores are 20 and 8 respectively. What is the z-score corresponding to a test score of 14?

1. 6
2. 0,75
3. -0,75

Question 24

Joseph scores 60% in a History test (class mean 65%, standard deviation 10%) and 50% in a Biology test (class mean 53%, standard deviation 12%). Use z-scores to decide which statement is true: Relative to the rest of his class Joseph does - - - - -

1. better in Biology than in History
2. better in History that in Biology
3. equally well in History and Biology

Question 25

The sampling error of the mean will be smaller in cases where the - - - - -

1. sample is larger and the standard deviation of the population smaller
2. population is larger and the variability of the scores in the sample is smaller
3. sample mean is smaller

Question 26

The central limit theorem implies that, for large samples from non-normal populations, - - - - -

1. the sampling distribution of the mean will be approximately normal
2. the distribution of sample values will be approximately normal
3. the observed relative frequency of an event will approach its theoretical probability

Question 27

Base your answers to Questions **27 to 29** 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 predicts that "dyslexic adults have a shorter memory span than adults in general".

Which of the following is an appropriate null hypothesis for testing the above prediction?

1. The mean memory span of the population of dyslexic adults is smaller than 7
2. The mean memory span of the population of dyslexic adults equals 7
3. The mean memory span of the population of adults equals 7

Question 28

Which of the following is an appropriate alternative hypothesis for testing the above prediction?

1. The mean memory span of the population of dyslexic adults is smaller than 7
2. The mean memory span of the population of adults is not equal to 7
3. The mean memory span of the population of dyslexic adults equals 7

Question 29

Testing the above prediction will require a - - - - - statistical test.

1. non-directional
2. two-tailed
3. directional

Question 30

Statistical hypotheses are statements about - - - - -

1. population parameters
2. sample statistics
3. both of the above

Question 31

The sampling distribution of a statistic (e.g. of the sample mean) can be calculated if we assume that the - - - - - hypothesis is true, but not if we assume that the - - - - - hypothesis is true.

1. null; alternative
2. alternative; null
3. statistical; research

Question 32

When applying a statistical test, the p-value represents the probability of obtaining the - - - - -

1. sample statistic under the alternative hypothesis
2. population parameter under the null hypothesis
3. sample statistic under the null hypothesis

Question 33

If we assume the alternative hypothesis: "The population mean is smaller than 50", which one of the following statements is true of the sampling distribution of the mean?

1. It is assumed to be the same as under the null hypothesis
2. It cannot be derived
3. It is assumed to correspond to the lower half of a normal distribution

Question 34

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 35

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 36

The hypothesis "H_1: $\mu < 30$" is a - - - - - hypothesis and requires a - - - - - statistical test.

1. non-directional; one-tailed
2. directional; two-tailed
3. directional; one-tailed

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 a decision is reached by comparing the - - - - - to the - - - - -

1. p-value; level of significance
2. test statistic; population parameter
3. test statistic; level of significance

Question 41

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 42

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 43

When applying a statistical test, the probability of a type I error is equal to - - - - -

1. 0,05 or 0,01
2. the level of significance
3. the p-value of the test statistic under the alternative hypothesis

Question 44

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 45

The nature of the research process and of statistical analysis are such that statistically significant results are - - - - -

1. also psychologically important
2. psychologically important if a high level of significance was used
3. not necessarily psychologically important

Question 46

A researcher draws a single random sample from a population to test his hypothesis about the mean population score on a psychological test. Scores on this test are distributed normally in the general population with a known mean but an unknown standard deviation. Which test statistic should the researcher calculate to test his hypothesis?

1. The t-statistic for the mean of a single sample
2. The z-statistic for the mean of a single sample
3. The standard deviation of the sampling distribution of the mean of a single sample

Question 47

Base your answers to Questions **47 to 50** on the following scenario:

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 48

Which research design did you use?

1. A correlational design with variables measured on a nominal scale
2. A two-groups design with measures of age and gender
3. A single-sample groups design

Question 49

Which is the appropriate test statistic to calculate?

1. The z-statistic for a sample proportion
2. The z-statistic for the mean of a single sample
3. The t-statistic for the mean of a single sample

Question 50

What are the requirements with regard to statistical testing of the results?

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

Question 51

Base your answers to Questions **51 to 53** on the following scenario:

To validate a new depression scale a researcher applies it to 50 patients diagnosed with depression and 50 patients diagnosed with stress. She predicts that the depression sample will score higher (more depression) than the stress sample. The mean scores of the two samples are found to be 30 (standard deviation 10) and 25 (standard deviation 10) respectively.

Which is an appropriate null hypothesis for the analysis of the results?

1. $\mu_1 = \mu_2$
2. $\mu = 25$
3. The population mean of the difference score equals zero

Question 52

Which research design did the researcher use?

1. Single-sample groups design
2. Two-sample groups design
3. Two-sample correlational design

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

Base your answers to Questions **54 to 56** on the following scenario:

To test the efficacy of psychotherapy aimed at relieving depression, a researcher applies a depression scale to 50 depressed patients at the start and again at the end of their treatment, predicting that the latter scores will be lower (reflecting less depression). Scores on his depression scale among the general population have a mean of 30 and a standard deviation of 10.

The depression scores of which population(s) are studied in this research?

1. The general population
2. The 50 participants in the research
3. Depressed patients that could potentially have undergone psychotherapy

Question 55

Which research design is appropriate to test the research hypothesis?

1. A two-sample groups design with independent groups
2. A two-sample groups design with dependent groups
3. A one-sample groups design

Question 56

Which is an appropriate alternative hypothesis for the analysis of the results?

1. $\mu < 30$
2. $\mu_1 < \mu_2$
3. The population mean of the difference scores (after psychotherapy minus before psychotherapy) is larger than zero

Question 57

Base your answers to Questions **57 to 58** on the following scenario:

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 by comparing the marks obtained in an examination before the extra classes to the marks obtained in an examination after the extra classes.

Which is the most appropriate research hypothesis for the teacher to test?

1. The mean mathematics score after the extra classes is larger than before the extra classes for the experimental group
2. The mean mathematics difference score (after minus before) of the experimental group is larger than that of the control group
3. The mean mathematics score after extra classes is higher for the experimental group than for the control group

Question 58

Which is the appropriate test statistic to be calculated when analysing the results of this research?

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

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

Base your answers to Questions **60 to 61** on the following scenario:

A marriage counsellor expects that second marriages more often end in divorce than first marriages. She tests this hypothesis by following up 200 marriages that were all registered five years ago, 50 in which at least one partner had been married before and 150 in which neither partner had been married before. Of the 150 first marriages 30 ended in divorce; of the 50 second marriages 10 ended in divorce.

Which constructs feature in the researcher's hypothesis?

1. Type of marriage (first/second); divorced (yes/no)
2. First marriage; second marriage; divorced (yes/no)
3. First marriage; second marriage; divorced; not divorced

Question 61

What are the requirements with regard to a statistical test for the results obtained?

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

Question 62

A politician asks his audience of 100 whether they will vote for him, and 60 say yes. He then delivers his speech and repeats the question. Now 70 persons say yes. When analysing these results the two sets of answers should be regarded as - - - - -

1. dependent
2. independent
3. having been drawn from the same population

Question 63

In correlational research one investigates the relation between - - - - -

1. the mean of a single sample of subjects and a population mean
2. two groups of subjects, with respect to a single variable
3. two variables measured on the same group of subjects

Question 64

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 with regard to a single variable measured on an interval or ratio scale

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

Which of the following can take on a value of -0,5?

1. a probability
2. a level of significance
3. a correlation coefficient

Question 67

What is the correlation coefficient between the following values of X and Y?
X -2 -1 0
Y -2 -1 0

1. -1
2. 0
3. +1

Question 68

A researcher hypothesizes that the drug treatment of hospitalised schizophrenic patients improves their mental alertness. He studies a random sample of 27 such patients and finds a correlation coefficient of 0,6 between the number of days of drug treatment and patients' scores on the Mental Alertness Test.

Which is an appropriate null hypothesis for this research?

1. $\rho = 0$
2. $\mu = 0$
3. $P = 0$

Question 69

A researcher obtains a correlation coefficient of 0,40 between IQ scores and examination marks in a random sample of 10 PYC 304 students, and again a correlation coefficient of 0,40 between the same two variables on another random sample of 100 PYC 304 students. Which of these two correlation coefficients is the more likely to differ significantly from zero under the null hypothesis?

1. That obtained on the smaller sample
2. Both are equally likely to be significant
3. That obtained on the larger sample

Question 70

A contingency table is used to summarize the relationship between two variables measured on - - - - - scale.

1. a nominal
2. an ordinal
3. an interval or ratio

[TOTAL: 70]