MANICALAND STATE UNIVERSITY OF APPLIED SCIENCES

FACULTY OF APPLIED SOCIAL SCIENCES

APPLIED PSYCHOLOGY DEPARTMENT

PSYCHOMETRICS
CODE: HPSY413

SESSIONAL EXAMINATIONS

APRIL 2023

DURATION: 3 HOURS

EXAMINER: MR I. SIFELANI

INSTRUCTIONS

1. Answer **question 1** and **any other 3 questions**.
2. Total marks **100**.

Additional material: Scientific calculator

Answer **question 1** and **any other 3**

Question 1

The table below shows the performance of students in a Psychometrics examination.Use the table to answer question 1.

Student	Overall % score	Performance on a sample of test items/questions		
		Item 1	Item 2	Item 3
Mars	100	1	1	1
Jupiter	92	1	0	1
Star	90	1	0	1
Orion	90	0	1	1
Moon	87	1	1	0
Sun	79	1	1	0
Blue	75	1	1	0
Red	74	0	1	0
Purple	64	0	1	0
Orange	62	1	1	0
Maroon	59	1	1	0
Blue	55	0	1	1
Grey	50	0	1	0
Black	48	1	1	0
Green	40	0	1	0

Key:*1 stands for correct answer and 0 stands for a wrong answer*

1 a) Calculate the difficulty indexes for items 1, 2 and 3.   (**9 marks**)

b) Using the results obtained in 1(a);

i. Give reasons why item 2 is not a good question   (**2 marks**)

ii. Comment on item 1   (**2 marks**)

c) Calculate the discrimination indexes for items 1, 2 and 3   (**9 marks**)

d) Using the discrimination indexes calculated in 1(c), justify the item you would consider for inclusion in the test measure under construction.   (**3 marks**)

Question 2

a. (i) Calculate the confidence interval for a child who obtains an IQ of 80 on a psychological test with SEM=5. Use 99 percent level of confidence.   (**5 marks**)
    (ii) Interpret the answer obtained in 2a (i).   (**2 marks**)
b. Explain the following:
    (i)   Error of measurement   (**6 marks**)
    (ii)   Item discrimination   (**6 marks**)
    (iii)   Item difficulty   (**6 marks**)

Question 3

Discuss any **four purposes** of psychological tests. **(25 marks)**

Question 4

Examine the processes that a psychologist would follow when developing a psychological test.
(25 marks)

Question 5

Imagine that you are a psychometrist. Ten candidates who applied for the post of marketing manager have gone through the first round of the interview and have been referred to you for psychometric testing.

a. What logistical arrangements would you consider before administering the tests?
(5 marks)

b. Describe the procedures that you would follow when conducting the tests.
(5 marks)

c. Justify the battery of tests that you would use. **(5 marks)**

d. Briefly explain four ethical obligations that you would observe with regards to the test-takers.
(5 marks)

e. State any five likely biases that can affect your psychological testing. **(5 marks)**

Question 6

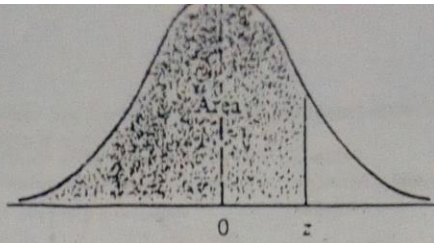Examine any four types of validity of psychological measures. **(25 marks)**

END OF EXAMINATION

FORMULAS

- $SEM = S_t\sqrt{1-r_{tt}}$
- $CI = \text{obtained score} \pm Z(SEM)$

- $D = \dfrac{U}{n_u} - \dfrac{L}{n_1}$

- $p\text{-value} = \dfrac{number\ of\ people\ who\ answered\ the\ item\ correctly}{number\ of\ people\ who\ took\ the\ measure}$

Table 1
Areas Under the Normal Curve

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	$a = 1 - \phi(Z_a)$
											a	z
−3.4	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002		
−3.3	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0003		
−3.2	0.0007	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005	0.10	1.2816
−3.1	0.0010	0.0009	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0007	0.0007	0.05	1.6449
−3.0	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011	0.0010	0.0010	0.025	1.9600
−2.9	0.0019	0.0018	0.0017	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014	0.010	2.3263
−2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019	0.005	2.5758