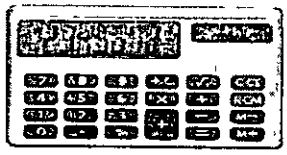
UNIVERSITY EXAMINATIONS



UNIVERSITEITSEKSAMENS

UNISA university of south africa

BNU1501 (482429) October/November 2017

BASIC NUMERACY

Duration 2 Hours 100 Marks

EXAMINERS

FIRST MRS JC BEDEKER
SECOND DR JE SINGLETON

Programmable pocket calculator is permissible

Closed book examination

This paper consists of 17 pages including a list of formulas (17) and seven sheets of paper for rough work, plus instructions for completing the mark-reading sheet

Answer *all* the questions

Complete the attendance register on the back page of this paper, tear it off and hand it to the invigilator.

Answer *all* the questions on the mark-reading sheet supplied Carefully follow the instructions for completing the mark-reading sheet Also pay attention to the following

- Only one option (indicated as [1] [2] [3] [4]) per question is correct Do not mark more than one option per question on the mark-reading sheet
- Where necessary, answers are rounded off
- Marks will not be deducted for incorrect answers
- The paper consists of 25 questions for a total of 100 marks

Write your name on the mark-reading sheet This will enable us to link you to the mark-reading sheet should you enter your student number incorrectly.

Question 1

Suppose q loaves of bread cost c rand. Indicate an expression for the cost of 5 loaves of bread

[1] $\frac{5c}{q}$ rand

[2] $5qc$ rand

[3] $\frac{5q}{c}$ rand

[4] $\frac{c}{5q}$ rand

Question 2

Simplify the following expression as far as possible

$$6x^2 - y\left(9x + 2y\right) - 3\left(xy - y^2\right)$$

[1] $6x^2 - 12xy - y^2$

[2] $-12xy - 5y^2 + 6x^2$

[3] $-9xy - 3y^2 - 2y + 6x^2$

[4] $6x^2 - 12xy + y^2$

Question 3

Simplify the following expression as far as possible

$$\left(2a^3b^2\right)^4 \times 3a^2b^3$$

[1] $24a^{24}b^{24}$

[2] $48a^{14}b^{11}$

[3] $24a^{14}b^{11}$

[4] $48a^{24}b^{24}$

Question 4

Simplify the following expression as far as possible

$$\sqrt{64a^8b^{64}}$$

[1] $8a^4b^8$

[2] $32a^2b^{32}$

[3] $8a^4b^{32}$

[4] $32a^2b^8$

ROUGH WORK

Question 5

Solve the following equation

$$2(2y-1)-3y=4-y$$

[1] $y=\frac{5}{2}$

[2] $y=0$

[3] $y=3$

[4] $y=-2$

Question 6

Solve the following equation

$$\frac{3x}{4}+2\frac{1}{2}=2x$$

[1] $x=2$

[2] $x=\frac{1}{2}$

[3] $x=-10$

[4] $x=\frac{2}{5}$

Question 7

Simplify the following expression as far as possible

$$\frac{a^2}{4b}-\frac{2b}{a^2}\times\frac{2b^2}{a^2}$$

[1] $\frac{b^2}{a^2}$

[2] $\frac{4b^2}{a^2}$

[3] $\frac{a^2}{4}$

[4] $\frac{a^2}{4b^2}$

Question 8

Simplify the following expression as far as possible

$$\frac{2}{a}+\frac{3}{ab}$$

[1] $\frac{5}{2ab}$

[2] $\frac{2b+3}{ab}$

[3] $\frac{5}{a}$

[4] $\frac{5}{a(1+b)}$

ROUGH WORK

Question 9

Simplify the following expression as far as possible

$$\frac{3}{4} + \frac{1}{2} - \frac{4}{5}$$

[1] $1\frac{9}{16}$

[2] $1\frac{3}{8}$

[3] $3\frac{2}{5}$

[4] $5\frac{1}{2}$

Question 10

If $F = \frac{9}{5}C + 32$, make C the subject of the formula

[1] $C = \frac{5F - 32}{9}$

[2] $C = \frac{5F}{9} + \frac{160}{9}$

[3] $C = \frac{5F + 32}{9}$

[4] $C = \frac{5}{9}F - \frac{160}{9}$

Question 11

The straight line passing through points $(3, 2)$ and $(0, 5)$ is

[1] an ascending line

[2] a vertical line

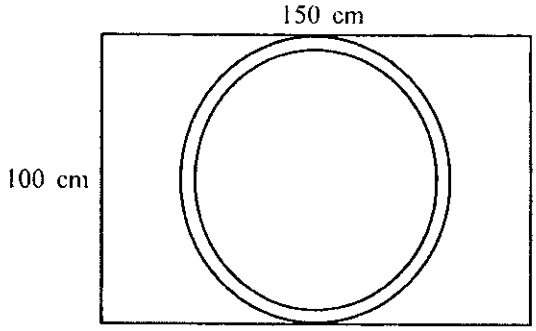
[3] a descending line

[4] a horizontal line

ROUGH WORK

Question 12

Consider the sketch below A rectangular piece of material with sides of 150 cm and 100 cm is used to make a circular table cloth The diameter of the completed cloth must be 0,9 m, and 5 cm is provided for the hem How much material is wasted?



[1] 0,864 m^2

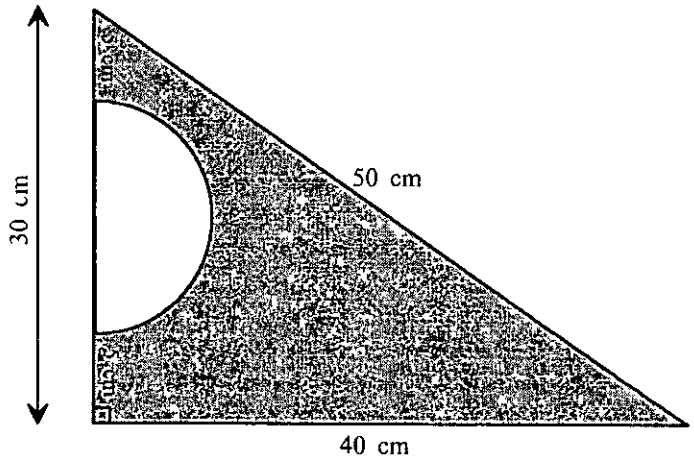
[2] 1,469 m^2

[3] 0,715 m^2

[4] 1,472 m^2

Question 13

Consider the sketch below A semicircle is drawn inside a triangle as indicated on the sketch The side lengths of the triangle are 30 cm, 40 cm and 50 cm, respectively Calculate the perimeter of the shaded part



[1] 442,92 cm

[2] 131,42 cm

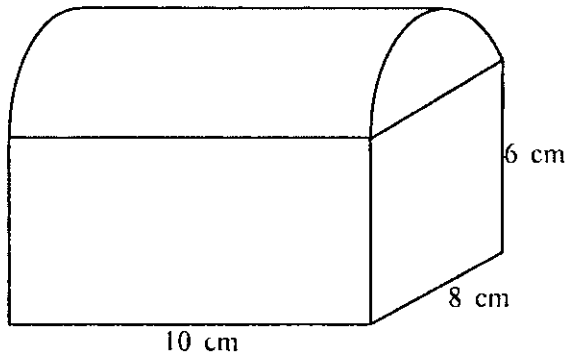
[3] 162,83 cm

[4] 147,12 cm

ROUGH WORK

Question 14

Calculate the volume of the container shown in the figure below It is a rectangular box with a curved lid that is a cylinder sliced down the middle



[1] 229 cm^3

[2] 731 cm^3

[3] 631 cm^3

[4] 983 cm^3

Question 15

A furniture manufacturer produces chairs The daily fixed costs (that is, rental, phones, stationery and salaries) of the production of these chairs are R12 000 The cost of producing one chair is R500 and the chair sells for R1 500 Suppose the manufacturer sells all the chairs that he produces each day How many chairs does the manufacturer have to produce per day to make a profit of R20 000 per day?

[1] 32

[2] 20

[3] at least 22

[4] 8

Question 16

Suppose the price of a pair of shoes, including 14% VAT, is R240 The price of the pair of shoes is reduced by 15% on a sale What is the reduced price of the shoes, including VAT?

[1] R204,00

[2] R237,60

[3] R170,40

[4] R225,00

ROUGH WORK

Question 17

The inclining block tariffs per month for residential electricity for the 2016/2017 financial year are given below The tariffs do not include VAT

Domestic supply / Usage in kWh	Rand per kWh (kilowatt hour)
0-100 kWh	1,3032
101-400 kWh	1,5250
401-650 kWh	1,6610
More than 650 kWh	1,79

What will the electricity bill (without VAT) be for a month in which a household uses 600 kWh electricity?

[1] R996,00

[2] R2 693,52

[3] R1 072,52

[4] R920,02

Question 18

The ratio of the number of female teachers to the number of male teachers in a school is 4 3 If there are 12 male teachers at the school, how many teachers are there in total?

[1] 16

[2] 24

[3] 28

[4] 25

Question 19

Determine the amount that has to be invested now, to be worth R10 000 in 8 months' time, if the annual simple interest rate is 9,75%

[1] R1 333,33

[2] R9 389,67

[3] R6 060,61

[4] R9 398,61

Question 20

Helen needs R20 000 in three years' time How much should she deposit now into an account that offers an annual interest rate of 15%, compounded every 3 months, to have the required amount by then? The answer, to the nearest rand is

[1] R13 793

[2] R19 910

[3] R12 858

[4] R12 892

ROUGH WORK

Question 21

How much can Lerato borrow from a bank if she can repay the loan by means of quarterly payments of R2 000 starting at the end of the first quarter The interest rate is 18% per annum compounded quarterly and the duration of the loan is 10 years

[1] R214 061

[2] R36 803

[3] R15 825

[4] R17 504

Question 22

Sam plans to buy a car for R125 000 He pays a 15% deposit and manages to secure a bank loan for the outstanding amount The bank charges 12,5% per annum, compounded monthly Determine what Sam's minimum monthly payment will have to be if the loan has to be repaid in six years time

[1] R2 104,94

[2] R998,17

[3] R2 476,40

[4] R1 476,69

Question 23

Refer to Sam's loan in question 22 above
What will the outstanding amount on Sam's loan be after 3 years' minimum payments have been made? Assume the interest rate stayed fix for the whole period

[1] R103 224,20

[2] R53 125,00

[3] R74 024,78

[4] R62 921,07

Question 24

Consider Sam's loan in question 22 above
Suppose Sam decides to pay R2 500 monthly into this loan account from the start How long will it take Sam to pay off the loan?

[1] 14 1 years

[2] 56,5 years

[3] 3,5 years

[4] 4,7 years

ROUGH WORK

Question 25

John has decided to start saving for a car. On his 15th birthday, he starts depositing R500 per week into a bank account with an annual interest rate of 8% compounded weekly. He will continue to make these weekly payments until the day of his 24th birthday. How much money will he have saved by then to finance the purchase of a new car?

[1] R397 856,29

[2] R166 717,97

[3] R342 321 48

[4] R78 714 77

TOTAL 100

FORMULAS

$$C = 2(l + w)$$
$$C = 4l$$
$$C = a + b + c$$
$$C = 2\pi r$$

$$A = l \times w$$
$$A = l^2$$
$$A = \tfrac{1}{2}bh$$
$$A = \pi r^2$$

$$V = l^3$$
$$V = l \times base \times h$$
$$V = \pi r^2 h$$

$$y - y_1 = m\,(x - x_1)$$

$$\frac{y - y_1}{x - x_1} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$I = Prt$$

$$S = P\,(1 + rt)$$

$$S = P\,(1 + i)^n$$

$$P = R\left[\frac{(1 + i)^n - 1}{i(1 + i)^n}\right]$$

$$S = R\left[\frac{(1 + i)^n - 1}{i}\right]$$

UNIVERSITY OF SOUTH AFRICA UNISA UNIVERSITEIT VAN SUID-AFRIKA

EXAMINATION MARK READING SHEET EKSAMEN-MERKLEESBLAD

PART 1 (GENERAL/ALGEMEEN) DEEL 1

STUDY UNIT e g PSY100 X / STUDIE EENHEID bv PSY100-X

1

PAPER NUMBER / VRAESTELNOMMER

2

INITIALS AND SURNAME / VOORLETTERS EN VAN

3

DATE OF EXAMINATION / DATUM VAN EKSAMEN

4

EXAMINATION CENTRE (C G PRETORIA) / EKSAMENSENTRUM (BV PRETORIA)

5

STUDENT NUMBER / STUDENTENOMMER

6

UNIQUE PAPER NO / UNIEKE VRAESTEL NR

8

7

9

For use by examination invigilator

Vir gebruik deur eksamenopsiener

IMPORTANT

1 USE ONLY AN HB PENCIL TO COMPLETE THIS SHEET
2 MARK LIKE THIS
3 CHECK THAT YOUR INITIALS AND SURNAME HAS BEEN FILLED IN CORRECTLY
4 ENTER YOUR STUDENT NUMBER FROM LEFT TO RIGHT
5 CHECK THAT YOUR STUDENT NUMBER HAS BEEN FILLED IN CORRECTLY
6 CHECK THAT THE UNIQUE NUMBER HAS BEEN FILLED IN CORRECTLY
7 CHECK THAT ONLY ONE ANSWER PER QUESTION HAS BEEN MARKED
8 DO NOT FOLD

BELANGRIK

1 GEBRUIK SLEGS 'N HB POTLOOD OM HIERDIE BLAD TE VOLTOOI
2 MERK AS VOLG
3 KONTROLEER DAT U VOORLETTERS EN VAN REG INGEVUL IS
4 VUL U STUDENTENOMMER VAN LINKS NA REGS IN
5 KONTROLEER DAT U DIE KORREKTE STUDENTENOMMER VERSTREK HET
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

Each row: c1 c2 c3 c4 c5

MARK READING SHEET INSTRUCTIONS

Your mark reading sheet is marked by computer and should therefore be filled in thoroughly and correctly

USE ONLY AN HB PENCIL TO COMPLETE YOUR MARK READING SHEET

PLEASE DO NOT FOLD OR DAMAGE YOUR MARK READING SHEET

Consult the illustration of a mark reading sheet on the reverse of this page and follow the instructions step by step when working on your sheet

Instruction numbers ❶ to ❿ refer to spaces on your mark reading sheet which you should fill in as follows

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

P	S	Y	1	0	0	-	X

❷ The paper number pertains only to first-level courses consisting of two papers

WRITE | 0 | 1 | for the first paper and | 0 | 2 | for the second If only one paper, then leave blank

❸ Fill in your initials and surname

❹ Fill in the date of the examination

❺ Fill in the name of the examination centre

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

NB Your unique paper number appears at the top of your examination paper and consists only of digits (e g 403326)

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

❿ Question numbers 1 to 140 indicate corresponding question numbers in your examination paper The five spaces with digits 1 to 5 next to each question number indicate an alternative answer to each question The spaces of which the number correspond to the answer you have chosen for each question and should be marked as follows [-]

♦ For official use by the invigilator Do not fill in any information here