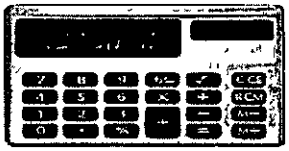
UNIVERSITY EXAMINATIONS



UNIVERSITEITSEKSAMENS

UNISA university of south africa

# BNU1501 ( 471999) October/November 2014

## BASIC NUMERACY

Duration 2 Hours 100 Marks

**EXAMINERS .**
FIRST MRS JC BEDEKER
SECOND MRS MC STRYDOM

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**Programmable pocket calculator is permissible**

**Closed book examination**

**This examination question paper remains the property of the University of South Africa and may not be removed from the examination venue**

This paper consists of 14 pages including 3 pages for rough work

Answer *all* the questions

**Please 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] [5]) per question is correct Do not mark more than one option per question on the mark-reading sheet
- Marks will not be deducted for incorrect answers
- The paper consists of 25 questions for a total of 100 marks

**You are strongly advised to write your name on the mark-reading sheet. Then we will still be able to link you to the mark-reading sheet if you have entered your student number incorrectly.**

## Question 1

Simplify the following expression

$$a^3 - 2ba^2 + 10b^2a - 5a^2b + 14b^3 - 7ab^2$$

[1] $a^3 + 8ba^2 - 12a^2b + 14b^2$

[2] $a^3 + 10a^4b^2 - 70b^4a^2 + 14b^3$

[3] $a^3 - 7a^2b + 3ab^2 + 14b^3$

[4] $14a^3b^3 - 20b^3a^3 + 35a^3b^3$

[5] None of the above

## Question 2

Simplify the following expression

$$30xy - (15x^2y^3 \times 2y^0)$$

[1] $\frac{1}{xy^2}$

[2] $\frac{2y}{x}$

[3] $\frac{2}{xy^2}$

[4] $\frac{4}{xy^2}$

[5] None of the above

## Question 3

Simplify the following expression

$$30x^4y^3 - 15x^2y^3 \times 2y^3$$

[1] $4x^3y^4$

[2] $4x^4y^3$

[3] $\frac{x^4}{y^3}$

[4] $\frac{x^3}{y^3}$

[5] None of the above

## Question 4

Solve for $x$ in the following equation

$$2x - 3 = 3 - x$$

[1] 0

[2] 6

[3] 2

[4] $-2x$

[5] None of the above

## Question 5

Solve for $x$ in the following equation

$$2(2x-1) = x+1$$

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

[2] 2

[3] 3

[4] 1

[5] None of the above

## Question 6

The correct mathematical expression for a number which is 5 times as big as the number obtained after $x$ has been decreased by 3, is

[1] $5x-3$

[2] $5(x-3)$

[3] $(x-3)+5$

[4] $x-15$

[5] None of the above

## Question 7

A motorist travels 270 km in $p$ hours An expression for the distance which this motorist travels in $x$ hours, is

[1] $\frac{270}{p} \times x$

[2] $\frac{270}{x} \times p$

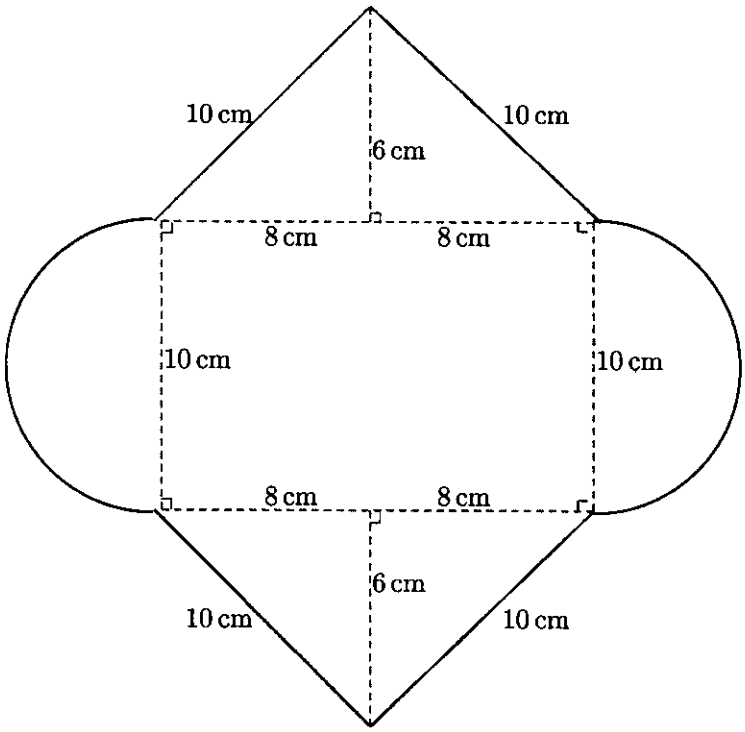
[3] $\frac{270}{x} \div p$

[4] $\frac{p}{270} \times x$

[5] None of the above

## Question 8

All the measurements in the sketch below are in centimetre




Determine the circumference of the figure given above The answer *in metre*, rounded to two decimal digits, is

[1] 0,71 m

[2] 1,16 m

[3] 0,60 m

[4] 1,03 m

[5] None of the above

## Question 9

Determine the area of the figure given in question 8 above, rounded to two decimal digits The correct answer is

[1] 286,54 $cm^2$

[2] 570,16 $cm^2$

[3] 126,54 $cm^2$

[4] 334,54 $cm^2$

[5] None of the above

## Question 10

Determine the volume of a rectangular prism which is 60 cm long, 35 cm wide and 10 cm high The answer **in litre** rounded to two decimal places, is

[1] 21 000,00 $\ell$

[2] 0,02 $\ell$

[3] 6,10 $\ell$

[4] 21 $\ell$

[5] None of the above

## Question 11

Calculate the cost of gravelling a square playing field of side length 32 m at R60 per square metre The cost is

[1] R1 920,00

[2] R3 840,00

[3] R61 440,00

[4] R193 019,45

[5] None of the above

## Question 12

Change the subject of the formula $S = P(1 + rt)$ to $P$

[1] $P = S - rt$

[2] $P = \frac{S}{1+rt}$

[3] $P = \frac{S-1}{rt}$

[4] $P = \frac{S}{rt}$

[5] None of the above

## Question 13

Change the subject of the formula $c = \frac{x}{a} - b$ to $x$

[1] $x = ca + b$

[2] $x = c + b - a$

[3] $x = ba + ca$

[4] $x = abc$

[5] None of the above

## Question 14

A manufacturer produces 50 T-shirts per day at a cost of R10 per T-shirt The daily fixed cost is R500 The T-shirts sell at a price of R35 per T-shirt Suppose he sells all the T-shirts he produces per day The profit he makes per week with six selling days, is

[1] R3 000

[2] R9 500

[3] R5 400

[4] R4 500

[5] None of the above

## Question 15

Determine the LCM of each of the following
(a) 18, 36 and 27
(b) 3st, $4s^2$ and $5t^2$

[1] (a) 36 (b) $60s^2t^2$

[2] (a) 108 (b) $30s^2t^2$

[3] (a) 216 (b) $30st$

[4] (a) 72 (b) $30s^3t^3$

[5] None of the above

## Question 16

Simplify each of the following

(a) $\frac{3}{8} - \frac{4}{7} \times \frac{9}{14}$

(b) $\frac{12}{6} \times \frac{4}{1} \div \frac{1}{2}$

(c) $\frac{3}{10} + \frac{5}{12}$

[1] (a) $\frac{49}{24}$ (b) 1 (c) $\frac{43}{11}$

[2] (a) $\frac{27}{196}$ (b) 4 (c) $\frac{8}{22}$

[3] (a) $\frac{27}{4}$ (b) $\frac{2}{3}$ (c) $\frac{15}{120}$

[4] (a) $\frac{27}{64}$ (b) 16 (c) $\frac{43}{60}$

[5] None of the above

## Question 17

The equation of the line passing through the points $(-1, 2)$ and $(2, 1)$ is

[1] $y = -\frac{1}{3}x - \frac{5}{3}$
[2] $y = -x + 3$
[3] $y = \frac{1}{3}x + \frac{7}{3}$
[4] $y = x + 1$
[5] None of the above

## Question 18

John bought a watch for R600 After 6 months he needed cash and sold it for R450 The percentage loss, accurate to two decimal digits, is

[1] 25,00%
[2] 150,00%
[3] 75,00%
[4] 33,33%
[5] None of the above

## Question 19

A manufacturer uses three main ingredients to make polish The ingredients are melted wax, water and white spirits which are mixed in the ratio 2 5:3 How many litre of melted wax are needed to be able to make 50 litres of polish? Give the answer to two decimal digits correct

[1] 7,69 $\ell$
[2] 25,00 $\ell$
[3] 10,00 $\ell$
[4] 15,00 $\ell$
[5] None of the above

## Question 20

Sipho wishes to purchase a second hand car costing R22 500 His father will lend him all the money at a simple interest rate of 12% per year for 5 years How much will Sipho need to pay his father in 5 years' time?

[1] R13 500
[2] R1 372 500
[3] R36 000
[4] R39 625,69
[5] None of the above

## Question 21

At what simple interest rate should R9 500 be invested to grow to R12 000 in 18 months? Give the answer correct to two decimal digits

[1] 17,54%

[2] 18,00%

[3] 0,18%

[4] 14%

[5] None of the above

## Question 22

How long, to the nearest year, does R36 450 need to be invested to grow to R50 000, if the interest rate is 10%, compounded monthly?

[1] 38 years

[2] 3 years

[3] 316 years

[4] 2 years

[5] None of the above

## Question 23

Nikiwe moves into her new flat and wants to buy R7 500 worth of furniture She has R5 500 to invest at an interest rate of 10% per year, compounded monthly How long, in years, will it take for her R5 500 to grow to R7 500?

[1] 37 years

[2] 4 years

[3] 38 years

[4] 3 years

[5] None of the above

## Question 24

Nick bought a house in 1998 for R480 000 He paid a R150 000 deposit He managed to secure a loan for the outstanding amount at an interest rate of 7,75% per year, compounded monthly How many years, to two decimal digits, will it take Nick to pay this loan off if he makes a payment of R5 000 at the end of every month?

[1] 12,53 years

[2] 4,60 years

[3] 7,19 years

[4] 6,24 years

[5] None of the above

## Question 25

Mr Moshokoa wants to start investing for his son's tertiary studies He wants to have R400 000 available in 12 years' time His investment account return 8,5% interest per year, compounded weekly His weekly investment into this account, to the nearest rand, has to be

[1] R1 607

[2] R369

[3] R1 203

[4] R1 022

[5] None of the above

**END OF PAPER**

**TOTAL: 100**

# FORMULAE

| | |
|---|---|
| **Circumference** | |
| Rectangle | $C = 2(l + w)$ |
| Square | $C = 4l$ |
| Triangle | $C = a + b + c$ |
| Circle | $C = 2\pi r$ |
| **Area** | |
| Rectangle | $A = l \times w$ |
| Square | $A = l^2$ |
| Triangle | $A = \frac{1}{2}bh$ |
| Circle | $A = \pi r^2$ |
| **Volume** | |
| Cube | $V = l^3$ |
| Prism | $V = l \times basis \times h$ |
| Cylinder | $V = \pi r^2 h$ |

**Straight line**

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

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

**Simple interest**

$$I = Prt$$

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

**Compound interest**

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

**Annuity: present value**

$$P = Ra_{\overline{n}i}$$

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

**Annuity: future value**

$$S = Rs_{\overline{n}|i}$$

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

**TOTAL: 100**

Rough work

Rough work

Rough work

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 (E G PRETORIA)
EKSAMENSENTRUM (BV PRETORIA)

5

STUDENT NUMBER
STUDENTENOMMER

6

7

UNIQUE PAPER NO
UNIEKE VRAESTEL NR

8

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 | 2 | 3 | 4 | 5 | 36 | 37 | 38 | 39 | 40 | 71 | 72 | 73 | 74 | 75 | 106 | 107 | 108 | 109 | 110 |
| 6 | 7 | 8 | 9 | 10 | 41 | 42 | 43 | 44 | 45 | 76 | 77 | 78 | 79 | 80 | 111 | 112 | 113 | 114 | 115 |
| 11 | 12 | 13 | 14 | 15 | 46 | 47 | 48 | 49 | 50 | 81 | 82 | 83 | 84 | 85 | 116 | 117 | 118 | 119 | 120 |
| 16 | 17 | 18 | 19 | 20 | 51 | 52 | 53 | 54 | | | | | | | 121 | 122 | 123 | 124 | 125 |
| 21 | 22 | 23 | 24 | 25 | 56 | 57 | 58 | 59 | 60 | 91 | 92 | 93 | 94 | 95 | 126 | 127 | 128 | 129 | 130 |
| 26 | 27 | 28 | 29 | 30 | 61 | 62 | 63 | 64 | 65 | 96 | 97 | 98 | 99 | 100 | 131 | 132 | 133 | 134 | 135 |
| 31 | 32 | 33 | 34 | 35 | 66 | 67 | 68 | 69 | 70 | 101 | 102 | 103 | 104 | 105 | 136 | 137 | 138 | 139 | 140 |