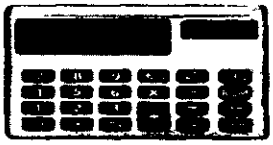
UNIVERSITY EXAMINATIONS



UNIVERSITEITSEKSAMENS

UNISA university of south africa

BNU1501 (490993) May/June 2015

BASIC NUMERACY

Duration 2 Hours 100 Marks

EXAMINERS
FIRST MRS JC BEDEKER
SECOND MRS MC STRYDOM

Programmable pocket calculator is permissible

Closed book examination.

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This paper consists of 13 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]) 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

Please write your name on the mark-reading sheet. This will enable us to be able to link you to the mark-reading sheet if you have entered your student number incorrectly.

Question 1

Simplify the following expression

$$6a^2 - 9ab + 2b^2 - 3\left(ba - b^2\right)$$

[1] $6a^2 - 12ab - b^2$

[2] $6a^2 - 6ab - b^2$

[3] $6a^2 - 12a^2b^2 + 5b^4$

[4] $6a^2 - 12ab + 5b^2$

Question 2

Simplify the expression

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

[1] $12a^4b^7c^6$

[2] $18a^4b^7c^6$

[3] $6a^3b^5c$

[4] $9a^6b^{16}c^6$

Question 3

Simplify the expression

$$\sqrt{16b^8c^4}$$

[1] $4b^4c^2$

[2] $8b^4c^2$

[3] $4b^8c^4$

[4] $8b^8c^4$

Question 4

Solve for x in the following equation

$$2x + 5 = x + 4$$

[1] 3

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

[3] -1

[4] 3

Question 5

Solve for x in the following equation

$$2(x-7)+3x=2x-8$$

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

[2] 2

[3] $-\frac{22}{3}$

[4] 1

Question 6

A certain number x decreased by 15 is equal to twice the number increased by 3
The correct mathematical expression or equation for the sentence given above, is

[1] $x-15=2x+3$

[2] $-15x=3(2x)$

[3] $x-15=2(x+3)$

[4] $-15x=2x+3$

Question 7

I have 20 coins, x of them are 2 rand coins and the rest is 5 rand coins
An expression in terms of x for the number of 5 rand coins I have, is

[1] $5x$

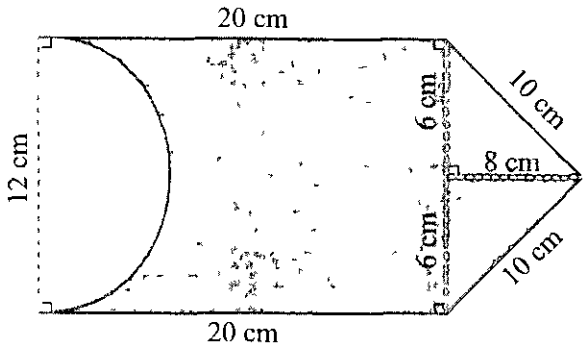
[2] $20-2x$

[3] $x-20$

[4] $20-x$

Question 8

Determine the circumference of the shaded figure below All the measurements in the sketch below, are in centimetre The dotted lines indicate measurements



The answer in centimetre rounded to two decimal places, is

[1] 173,10

[2] 72,00

[3] 78,85

[4] 92,00

Question 9

Determine the area (shaded) of the figure given in question 8 above, rounded to two decimal digits The area is

[1] 174,90 cm^2

[2] 344,55 cm^2

[3] 269,15 cm^2

[4] 231,45 cm^2

Question 10

Find 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 digits, is

[1] 21 000,00 ℓ

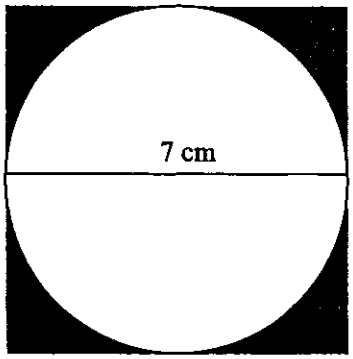
[2] 21,00 ℓ

[3] 0 02 ℓ

[4] 6,10 ℓ

Question 11

Calculate the shaded area in the figure given below, where we have a circle fitting exactly inside a square The diameter of the circle is 7 cm Give the answer rounded to two decimal digits



[1] $10{,}52\,\text{cm}^2$

[2] $87{,}48\,\text{cm}^2$

[3] $104{,}94\,\text{cm}^2$

[4] $27{,}01\,\text{cm}^2$

Question 12

If $S = 2\pi rh$, make r the subject of the formula

[1] $r = \dfrac{S}{2\pi h}$

[2] $r = S - 2\pi h$

[3] $r = \dfrac{2S}{\pi h}$

[4] $r = 2\pi Sh$

Question 13

If $v = u + at$, make t the subject of the formula

[1] $t = v - u - a$

[2] $t = \dfrac{v}{u + a}$

[3] $t = \dfrac{v - u}{a}$

[4] $t = \dfrac{u - v}{a}$

Question 14

A manufacturer produces 50 t-shirts per day at a cost of R20 per t-shirt The daily fixed cost is R1 000 When he sells all the t-shirts he produces per day, he makes a profit of R1 500 on such a day The selling price per t-shirt is

[1] R30,00
[2] R50,40
[3] R70,00
[4] R50,00

Question 15

Determine the LCM (lowest common multiple) of the following

$$4ab,\ 6a^2b^2,\ 14a^2b^3$$

[1] $84a^2b^3$
[2] $14a^2b^2$
[3] $2ab$
[4] $28a^3b^3$

Question 16

Simplify each of the following

a $\frac{2}{3}+\frac{2}{7}-\frac{1}{2}$

b $\frac{3}{4}\div\frac{3}{2}\times\frac{1}{2}$

c $\frac{3}{4}+\frac{1}{2}\times\frac{5}{4}$

[1] a $\frac{3}{8}$, b $\frac{1}{4}$, c $\frac{2}{3}$
[2] a $\frac{19}{42}$, b $\frac{1}{4}$, c $1\frac{3}{8}$
[3] a $\frac{19}{42}$, b 1, c $\frac{25}{4}$
[4] a $\frac{3}{8}$, b 1, c $\frac{2}{3}$

Question 17

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

[1] $y=-2x+4$
[2] $y=2x-4$
[3] $y=2x$
[4] $y=2x+4$

Question 18

A school had 1 200 learners in 2013 In 2014 the school had 1 380 learners The percentage increase from 2013 to 2014 was

[1] 180
[2] 115
[3] 15
[4] 87

Question 19

A cleaning liquid contains three main ingredients A, B and C mixed in the ratio 3 5 4 How many litres of ingredient B must be used to make 25 litres of the cleaning liquid?

[1] 10,42
[2] 6,25
[3] 8,33
[4] 12

Question 20

An investor deposits R10 000 at 18% simple interest rate per year for 2 years What would this amount to at the end of two years?

[1] R370 000
[2] R3 600
[3] R13 924
[4] R13 600

Question 21

Find the annual interest rate if the simple interest on R1 050 for 3 years and 6 months is R514,50

[1] 16%
[2] 1%
[3] 14%
[4] 49%

Question 22

How many years will it take for R10 000 to double if it is invested at a rate of 12%, and interest is compounded every 3 months?

[1] 23,45
[2] 5,86
[3] 17,67
[4] 5,89

Question 23

An amount of R10 000 is invested at an annual interest rate of 8%, compounded monthly Find the value of the investment after 5 years

[1] R14 898,46

[2] R25 919,25

[3] R10 040,08

[4] R14 000,00

Question 24

Joseph bought a town house in Northriding for R700 000 He paid a deposit of R100 000 and managed to secure a loan for the outstanding amount The term of the loan is 20 years and the applicable fixed interest rate is 7,75% per year, compounded monthly Calculate Joseph's monthly payment, to the nearest cent

[1] R5 746,64

[2] R1 050,69

[3] R2 519,51

[4] R4 925,69

Question 25

Jack needs R20 000, in 2 years time, to buy his brother's car He wants to start investing part of his weekly salary into an account which returns 8,5% interest per year, compounded weekly Calculate the weekly payment he needs to make into this investment account, to the nearest cent

[1] R209,27

[2] R176,58

[3] R767,45

[4] R192,15

TOTAL: 100

FORMULAS

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	$V = l \times base \times h$
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

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

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

Rough work

Rough work

Rough work

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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
6. 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
6. 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	c1 c2 c3 c4 c5	36	c1 c2 c3 c4 c5	71	c1 c2 c3 c4 c5	106	c1 c2 c3 c4 c5
2	c1 c2 c3 c4 c5	37	c1 c2 c3 c4 c5	72	c1 c2 c3 c4 c5	107	c1 c2 c3 c4 c5
3	c1 c2 c3 c4 c5	38	c1 c2 c3 c4 c5	73	c1 c2 c3 c4 c5	108	c1 c2 c3 c4 c5
4	c1 c2 c3 c4 c5	39	c1 c2 c3 c4 c5	74	c1 c2 c3 c4 c5	109	c1 c2 c3 c4 c5
5	c1 c2 c3 c4 c5	40	c1 c2 c3 c4 c5	75	c1 c2 c3 c4 c5	110	c1 c2 c3 c4 c5
6	c1 c2 c3 c4 c5	41	c1 c2 c3 c4 c5	76	c1 c2 c3 c4 c5	111	c1 c2 c3 c4 c5
7	c1 c2 c3 c4 c5	42	c1 c2 c3 c4 c5	77	c1 c2 c3 c4 c5	112	c1 c2 c3 c4 c5
8	c1 c2 c3 c4 c5	43	c1 c2 c3 c4 c5	78	c1 c2 c3 c4 c5	113	c1 c2 c3 c4 c5
9	c1 c2 c3 c4 c5	44	c1 c2 c3 c4 c5	79	c1 c2 c3 c4 c5	114	c1 c2 c3 c4 c5
10	c1 c2 c3 c4 c5	45	c1 c2 c3 c4 c5	80	c1 c2 c3 c4 c5	115	c1 c2 c3 c4 c5
11	c1 c2 c3 c4 c5	46	c1 c2 c3 c4 c5	81	c1 c2 c3 c4 c5	116	c1 c2 c3 c4 c5
12	c1 c2 c3 c4 c5	47	c1 c2 c3 c4 c5	82	c1 c2 c3 c4 c5	117	c1 c2 c3 c4 c5
13	c1 c2 c3 c4 c5	48	c1 c2 c3 c4 c5	83	c1 c2 c3 c4 c5	118	c1 c2 c3 c4 c5
14	c1 c2 c3 c4 c5	49	c1 c2 c3 c4 c5	84	c1 c2 c3 c4 c5	119	c1 c2 c3 c4 c5
15	c1 c2 c3 c4 c5	50	c1 c2 c3 c4 c5	85	c1 c2 c3 c4 c5	120	c1 c2 c3 c4 c5
16	c1 c2 c3 c4 c5	51	c1 c2 c3 c4 c5	86	c1 c2 c3 c4 c5	121	c1 c2 c3 c4 c5
17	c1 c2 c3 c4 c5	52	c1 c2 c3 c4 c5	87	c1 c2 c3 c4 c5	122	c1 c2 c3 c4 c5
18	c1 c2 c3 c4 c5	53	c1 c2 c3 c4 c5	88	c1 c2 c3 c4 c5	123	c1 c2 c3 c4 c5
19	c1 c2 c3 c4 c5	54	c1 c2 c3 c4 c5	89	c1 c2 c3 c4 c5	124	c1 c2 c3 c4 c5
20	c1 c2 c3 c4 c5	55	c1 c2 c3 c4 c5	90	c1 c2 c3 c4 c5	125	c1 c2 c3 c4 c5
21	c1 c2 c3 c4 c5	56	c1 c2 c3 c4 c5	91	c1 c2 c3 c4 c5	126	c1 c2 c3 c4 c5
22	c1 c2 c3 c4 c5	57	c1 c2 c3 c4 c5	92	c1 c2 c3 c4 c5	127	c1 c2 c3 c4 c5
23	c1 c2 c3 c4 c5	58	c1 c2 c3 c4 c5	93	c1 c2 c3 c4 c5	128	c1 c2 c3 c4 c5
24	c1 c2 c3 c4 c5	59	c1 c2 c3 c4 c5	94	c1 c2 c3 c4 c5	129	c1 c2 c3 c4 c5
25	c1 c2 c3 c4 c5	60	c1 c2 c3 c4 c5	95	c1 c2 c3 c4 c5	130	c1 c2 c3 c4 c5
26	c1 c2 c3 c4 c5	61	c1 c2 c3 c4 c5	96	c1 c2 c3 c4 c5	131	c1 c2 c3 c4 c5
27	c1 c2 c3 c4 c5	62	c1 c2 c3 c4 c5	97	c1 c2 c3 c4 c5	132	c1 c2 c3 c4 c5
28	c1 c2 c3 c4 c5	63	c1 c2 c3 c4 c5	98	c1 c2 c3 c4 c5	133	c1 c2 c3 c4 c5
29	c1 c2 c3 c4 c5	64	c1 c2 c3 c4 c5	99	c1 c2 c3 c4 c5	134	c1 c2 c3 c4 c5
30	c1 c2 c3 c4 c5	65	c1 c2 c3 c4 c5	100	c1 c2 c3 c4 c5	135	c1 c2 c3 c4 c5
31	c1 c2 c3 c4 c5	66	c1 c2 c3 c4 c5	101	c1 c2 c3 c4 c5	136	c1 c2 c3 c4 c5
32	c1 c2 c3 c4 c5	67	c1 c2 c3 c4 c5	102	c1 c2 c3 c4 c5	137	c1 c2 c3 c4 c5
33	c1 c2 c3 c4 c5	68	c1 c2 c3 c4 c5	103	c1 c2 c3 c4 c5	138	c1 c2 c3 c4 c5
34	c1 c2 c3 c4 c5	69	c1 c2 c3 c4 c5	104	c1 c2 c3 c4 c5	139	c1 c2 c3 c4 c5
35	c1 c2 c3 c4 c5	70	c1 c2 c3 c4 c5	105	c1 c2 c3 c4 c5	140	c1 c2 c3 c4 c5