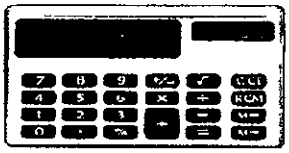
UNIVERSITY EXAMINATIONS



UNIVERSITEITSEKSAMENS

UNISA university of south africa

SMI181Q

(472562)

May/June 2018

Science: Mining I

Duration 2 Hours

100 Marks

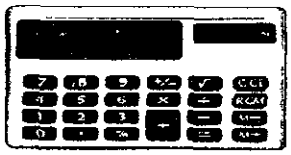
EXAMINERS

FIRST	DR LL NOTO
SECOND	PROF BM MOTHUDI

Use of a non-programmable pocket calculator is permissible

Closed book examination

UNIVERSITY EXAMINATIONS



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

- This examination paper consists of thirteen **(13) pages.**
- The paper consists of two sections, **Section A (30%)** and **Section B (70%).**
- **Answer Section A (Multiple choice) on the examination mark reading sheet.**
- **Answer Section B (Written solutions) in the examination answer book**
- Show all steps in carrying out the calculations
- The mark allocation for each question is indicated in square brackets to the right.
- The information given at the end of Section B may be used without proof.

Section A: Multiple Choice Questions (30 Marks)

1 An object projected vertically upwards reaches its maximum height and then returns to its original point of projection Ignoring the effects of friction, then direction of the acceleration of the object during its motion is ___ [3]

1 always vertically downwards
2 airst vertically upwards and then vertically downwards
3 airst vertically downwards and then vertically upwards
4 always vertically upwards
5 All of the above

2 A stone is dropped into a deep well and is heard to hit the water 3 41 s after being dropped How deep is the stone displaced inside the well? [3]

1 75 m downwards
2 75 m upwards
3 57 m downwards
4 57 m upwards
5 75 mm upwards

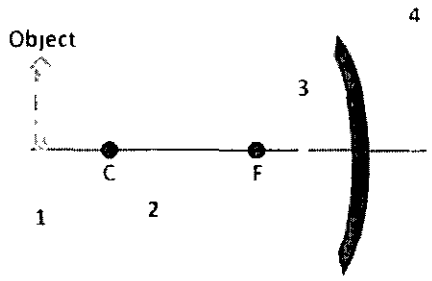
3 The kinetic energy of a 625-kg roller coaster car that is moving with a speed of 18 3 m/s, can be calculated to ___ [3]

1 $1\ 04 \times 10^5$ J
2 $1\ 04 \times 10^5$ kJ
3 $1\ 04 \times 10^5$ mJ
4 $1\ 04 \times 10^6$ J
5 $1\ 04 \times 10^6$ kJ

4 If the resistance of a circuit is tripled, then the current flowing through the circuit will be ___ [3]

1 one-third as much
2 three times as much
3 unchanged
4 nine times as much
5 there would be no way to make such a prediction

5 Below is a figure showing an object standing in front of a concave mirror Between, images 1,2,3 and 4, which is most likely to be the correct image of the object? [3]



1 1
2 2
3 3
4 4
5 All of the above

6 Which of the following statements is correct about plane mirrors? [3]

1 Plane mirrors always produce blurred images
2 Plane mirrors always produce multiple images
3 Plane mirrors produce inverted mirror
4 Plane mirrors never produce inverted images
5 All of the above

7 Which type of chemical reaction produces thermal energy? [3]

1 Endothermic reaction
2 Exothermic reaction
3 Solution reaction
4 All of the above
5 None of the above

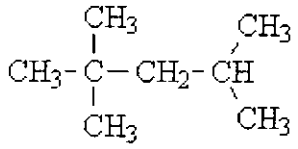
8 Which of the following chemical reactions is balanced? [3]

1 $2\ CaCO_3 + TiO_2 \rightarrow 2\ CaTiO_3 + CO_2$
2 $CaCO_3 + TiO_2 \rightarrow CaTiO_3 + CO_2$
3 $CaCO_3 + TiO_2 \rightarrow CaTiO_2 + CO_2$
4 $CaCO_3 + TiO_2 \rightarrow CaTiO_3 + 3CO_2$
5 $CaCO_3 + 2TiO_2 \rightarrow CaTiO_3 + 3CO_2$

9 In which chemical compound, do we find titanium (III) oxide? [3]

1 TiO_2
2 TiO
3 Ti_2O_3
4 All of the above
5 None of the above

10 What is the IUPAC name for the following compound? [3]



1 1,3 – pentamethylpropane
2 1,1,3 3 – tetramethylebutane
3 2,2,4 – trimethylpentane
4 2,4,4 – trimethylpentane
5 1,1,1,3 – trimethylpentane

Section B Written Solutions (70 Marks)

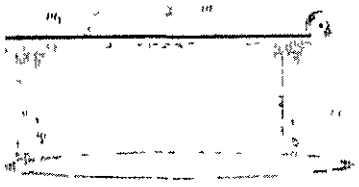
1 A motorboat traveling 6 m/s. East encounters a current traveling 3 8 m/s, south

1 1 What is the resultant velocity of the motor boat? Also draw the vector diagram (4)

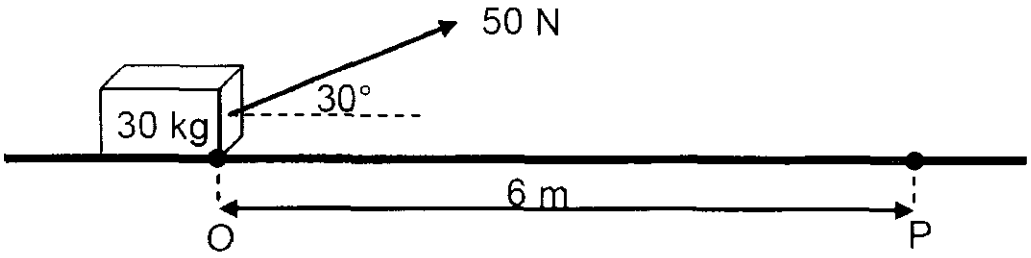
1 2 If the width of the river is 120 meters wide where is the motorboat displaced? (4)
[8]

2 An airplane accelerates down a runway at 3 20 m/s^2 for 32 8 s until is finally lifts off the ground Determine the distance travelled before take-off **[5]**

3 Find the acceleration of the masses shown in the figure Given that m1 = 1 0 kg m2 =2 0 kg, and m3 = 3 0 kg Assume the table is frictionless and the masses move freely **[3]**



4 A worker pulls a crate of mass 30 kg from rest along a horizontal floor by applying a constant force of magnitude 50 N at an angle of 30° to the horizontal A frictional force of magnitude 20 N acts on the crate whilst moving along the floor



4 1 Draw a labelled free body diagram to show all the forces acting on the crate (4)

4 2 Calculate the total force acting on the crate and indicate its direction (4)

4 3 Why all the vertical forces acting on the crate do not WORK on the crate (2)

4 4 Calculate the total work done on the crate as it reaches point P (4)
[14]

5 The following angle is given in degrees Convert it to radians 30° **[2]**

6 The angle of refraction of a ray of light traveling into an ice cube from air is 46° Find

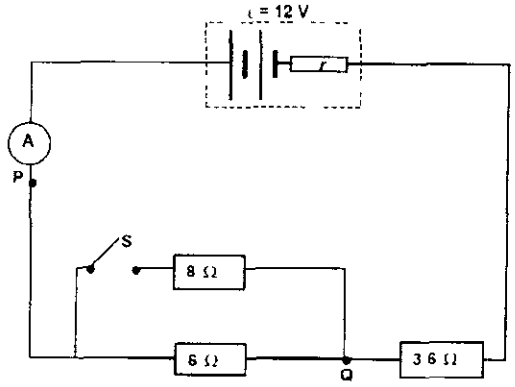
the angle of incidence **[2]**

7 An object with a height of 33 cm is placed 2 0 m in front of a concave mirror with a focal length of 0 75 m

7 1 Determine the approximate location and size of the image using a ray diagram (3)

7 2 Is the image upright or inverted? (2)
[5]

8 The circuit diagram below represents a combination of resistors in series and parallel The battery has an *emf* of 12V and an unknown internal resistance *r*



With switch S OPEN, ammeter A gives a reading of 1 2 A

8 1 Calculate the total resistance of the circuit (3)

8 2 Calculate the internal resistance of the battery (4)

With switch S closed

8 3 How will each of the following be affected? Write down only, INCREASE, DECREASE or REMAINS THE SAME

8 3 1 The total resistance of the circuit (2)

8 3 2 The reading on Ammeter A (2)

[11]

9 A 15,67g sample of hydrate of magnesium carbonate was carefully heated, without decomposing the carbonate, to drive off the water The mass was reduced to 7 58g

9 1 What is the amount of water that was lost in decomposing the hydrate? (1)

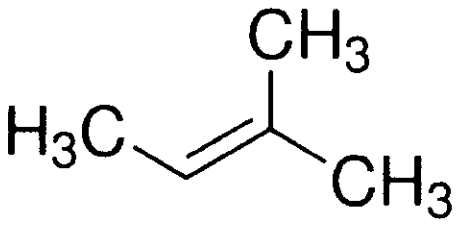
9 2 Write down the chemical formula of magnesium carbonate (2)

9 3 If the molar mass of magnesium carbonate is 84 31 g/mol calculate the remaining moles in the final compound (2)

9 4 If the molar mass of water is 18 02 g/mol calculate the lost water moles (2)

9 5 Work out the chemical formula of the hydrate compound from the mole ratios (2)
[9]

10 Write down the IUPAC names of the following chemical structures **[2]**



11 Consider the below chemical reaction

$H^+ + H_2O_2 + Fe^{2+} \rightarrow Fe^{3+} + H_2O$

11 1 Balance the equation (3)
11 2 Write down a balanced half reaction representing reduction (3)
11 3 Write down a balanced half reaction representing oxidation (3)
[9]

Total marks **[100]**

A2 FORMULAE

MOMENTUM

force $F = \frac{\Delta(mv)}{\Delta t}$

impulse $F\Delta t = \Delta(mv)$

CIRCULAR MOTION

angular velocity $\omega = \frac{v}{r}$

$\omega = 2\pi f$

centripetal acceleration $a = \frac{v^2}{r} = \omega^2 r$

centripetal force $F = \frac{mv^2}{r} = m\omega^2 r$

OSCILLATIONS

acceleration $a = -(2\pi f)^2 x$

displacement $x = A\cos(2\pi f t)$

speed $v = \pm 2\pi f\sqrt{A^2 - x^2}$

maximum speed $v_{max} = 2\pi fA$

maximum acceleration $a_{max} = (2\pi f)^2 A$

for a mass-spring system $T = 2\pi\sqrt{\frac{m}{k}}$

for a simple pendulum $T = 2\pi\sqrt{\frac{l}{g}}$

electric potential $\Delta W = Q\Delta V$

$V = \frac{1}{4\pi\varepsilon_0}\frac{Q}{r}$

capacitance $C = \frac{Q}{V}$

decay of charge $Q = Q_0 e^{-t/RC}$

time constant RC

capacitor energy stored $E = \frac{1}{2}QV = \frac{1}{2}CV^2 = \frac{1}{2}\frac{Q^2}{C}$

MAGNETIC FIELDS

force on a current $F = BIl$

force on a moving charge $F = BQv$

magnetic flux $\Phi = BA$

magnetic flux linkage $N\Phi = BAN$

magnitude of induced emf $\varepsilon = N\frac{\Delta\Phi}{\Delta t}$

emf induced in a rotating coil $N\Phi = BAN\cos\theta$

$\varepsilon = BAN\omega\sin\omega t$

transformer equations $\frac{N_s}{N_p} = \frac{V_s}{V_p}$

efficiency $= \frac{I_s V_s}{I_p V_p}$

Formulae for Physics

$$s = ut + \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$

$$v = u + at$$

$$\bar{F}_{net} = ma$$

$$\bar{f} = \mu \bar{F}_N$$

$$p = mv$$

$$\bar{F} = \frac{\Delta p}{\Delta t}$$

Impulse $= \bar{F}\Delta t = m\Delta v$

$$W = \bar{F}s$$

$$E_k = \frac{1}{2}mv^2$$

$$E_k = \frac{p^2}{2m}$$

$$E_p = mgh$$

$$P = \bar{F}v$$

$$a = \frac{v^2}{r} = \frac{4\pi^2 r}{T^2}$$

$$\theta = \frac{s}{r} (\theta \text{ in rads})$$

$$v_t = r\omega$$

$$\omega = \frac{\theta}{t}$$

$$\omega_f^2 = \omega_i^2 + 2\alpha\Theta$$

$$\omega_f = \omega_i + 2\alpha t$$

$$\omega = 2\pi f$$

$$a_c = \frac{v^2}{r}$$

$$\tau = Fl$$

$$\tau\omega = P$$

$$\tau = NIAB\sin\theta$$

$$B = \mu_0 nI$$

$$B = \frac{\mu_o I}{2\pi\alpha}$$

$$n_2 \sin\theta_2 = n_1 \sin\theta_1$$

$$f = \frac{R}{2}$$

$$\frac{1}{f} = \frac{1}{p} + \frac{1}{q}$$

$$M = \frac{h_i}{h_o} = -\frac{q}{p}$$

Formulae for Physics

$$I = \frac{q}{t}$$

$$V = IR$$

$$R = \frac{\rho L}{A}$$

$$P = IV = I^2R = \frac{V^2}{R}$$

$$V = \frac{W}{q}$$

$$\varepsilon = I\left(R + r\right)$$

$$R = R_1 + R_2 +$$

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} +$$

$$\bar{F} = k\frac{q_1 q_2}{r^2}$$

$$k = 9.0 \times 10^9 \frac{N\ m^2}{C^2}$$

$$\bar{F} = q\bar{E}$$

Formulae for Chemistry

$$n = \frac{m}{M}$$

$$c = \frac{n}{V}$$

$$d = \frac{m}{V}$$

$$\frac{c_a V_a}{n_a} = \frac{c_b V_b}{n_b}$$

$$\mathrm{p}H = -\log[H_3O^+]$$

$$\mathrm{p}OH = -\log[OH^-]$$

$$pH + pOH = 14$$

$$[OH^-][H_3O^+] = 1.0 \times 10^{-14}$$

$$PV = nRT$$

$$\frac{n_{ace}}{l_{ace}} + \frac{n_{an}}{l_{an}} = 0$$

PERIODIC TABLE

KEY

17	Atomic number
Cl	Symbol
35,45	Atomic mass

	1A	2A	3B	4B	5B	6B	7B	8B	8B	8B	1B	2B	3A	4A	5A	6A	7A	8A
1	1 **H** 1,008																	2 **He** 4,003
2	3 **Li** 6,941	4 **Be** 9,012											5 **B** 10,81	6 **C** 12,01	7 **N** 14,01	8 **O** 16,00	9 **F** 19,00	10 **Ne** 20,18
3	11 **Na** 22,99	12 **Mg** 24,31											13 **Al** 26,98	14 **Si** 28,09	15 **P** 30,97	16 **S** 32,06	17 **Cl** 35,45	18 **Ar** 39,95
4	19 **K** 39,10	20 **Ca** 40,08	21 **Sc** 44,96	22 **Ti** 47,90	23 **V** 50,94	24 **Cr** 52,00	25 **Mn** 54,94	26 **Fe** 55,85	27 **Co** 58,93	28 **Ni** 58,70	29 **Cu** 63,55	30 **Zn** 65,38	31 **Ga** 69,72	32 **Ge** 72,59	33 **As** 74,59	34 **Se** 78,96	35 **Br** 79,90	36 **Kr** 83,80
5	37 **Rb** 85,47	38 **Sr** 87,62	39 **Y** 88,91	40 **Zr** 91,22	41 **Nb** 92,91	42 **Mo** 95,94	43 **Tc** 98,91	44 **Ru** 101,1	45 **Rh** 102,9	46 **Pd** 106,4	47 **Ag** 107,9	48 **Cd** 112,4	49 **In** 114,8	50 **Sn** 118,7	51 **Sb** 121,8	52 **Te** 127,6	53 **I** 126,9	54 **Xe** 131,3
6	55 **Cs** 132,9	56 **Ba** 137,3	57 **La** 138,9	72 **Hf** 178,5	73 **Ta** 180,9	74 **W** 183,9	75 **Re** 186,2	76 **Os** 190,2	77 **Ir** 192,2	78 **Pt** 195,1	79 **Au** 197,0	80 **Hg** 200,6	81 **Tl** 204,4	82 **Pb** 207,2	83 **Bi** 209,0	84 **Po** 209,0	85 **At** 210,0	86 **Rn** 222,0
7	87 **Fr** 223,0	88 **Ra** 226,0	89 **Ac** 227,0	104 **Unq** 261,1	105 **Unp** 262,1	106 **Unh** 263,1	107 **Uns** 262,1											

La = LANTHANIDES	58 **Ce** 140,1	59 **Pr** 140,9	60 **Nd** 144,2	61 **Pm** 144,9	62 **Sm** 150,4	63 **Eu** 152,0	64 **Gd** 157,3	65 **Tb** 158,9	66 **Dy** 162,5	67 **Ho** 164,9	68 **Er** 187,3	69 **Tm** 168,9	70 **Yb** 173,0	71 **Lu** 175,0
Ac = ACTINIDES	90 **Th** 232,0	91 **Pa** 231,0	92 **U** 238,0	93 **Np** 237,0	94 **Pu** 244,1	95 **Am** 243,1	96 **Cm** 247,1	97 **Bk** 247,1	98 **Cf** 242,1	99 **Es** 252,1	100 **Fm** 257,1	101 **Md** 258,1	102 **No** 259,1	103 **Lr** 260,1

Turn Over

Standard Reduction Potentials of vanous half-reactions at 25 °C.

Half-reaction:	Standard reduction potential:
$F_2(g) + 2e^- \Phi 2F^-(aq)$	$E^0_{red}(F_2/F^-) = +2.87\ V$
$PbO_2(s) + SO_4^{2-}(aq) + 4H^+(aq) + 2e^- \Phi PbSO_4(s) + 2H_2O$	$E^0_{red}(PbO_2/PbSO_4) = +1.69\ V$
$MnO_4^-(aq) + 8H^+(aq) + 5e^- \Phi Mn^{2+}(aq) + 4H_2O$	$E^0_{red}(MnO_4^-/Mn^{2+}) = +1.51\ V$
$PbO_2(s) + 4H^+(aq) + 2e^- \Phi Pb^{2+}(aq) + 2H_2O$	$E^0_{red}(PbO_2/Pb^{2+}) = +1.46\ V$
$BrO_3^-(aq) + 6H^+(aq) + 6e^- \Phi Br^- + 3H_2O$	$E^0_{red}(BrO_3^-/Br^-) = +1.44\ V$
$Au^{3+}(aq) + 3e^- \Phi Au(s)$	$E^0_{red}(Au^{3+}/Au) = +1.42\ V$
$Cl_2(g) + 2e^- \Phi 2Cl^-(aq)$	$E^0_{red}(Cl_2/Cl^-) = +1.36\ V$
$O_2(g) + 4H^+(aq) + 4e^- \Phi 2H_2O$	$E^0_{red}(O_2/H_2O) = +1.23\ V$
$Br_2(aq) + 2e^- \Phi 2Br^-(aq)$	$E^0_{red}(Br_2/Br^-) = +1.07\ V$
$NO_3^-(aq) + 4H^+(aq) + 3e^- \Phi NO(g) + 2H_2O$	$E^0_{red}(NO_3^-/NO) = +0.96\ V$
$Ag^+(aq) + e^- \Phi Ag(s)$	$E^0_{red}(Ag^+/Ag) = +0.80\ V$
$Fe^{3+}(aq) + e^- \Phi Fe^{2+}(aq)$	$E^0_{red}(Fe^{3+}/Fe^{2+}) = +0.77\ V$
$I_2(s) + 2e^- \Phi 2I^-(aq)$	$E^0_{red}(I_2/I^-) = +0.54\ V$
$O_2(g) + 2H_2O + 4e^- \Phi 4OH^-(aq)$	$E^0_{red}(O_2/OH^-) = +0.40\ V$
$Cu^{2+}(aq) + 2e^- \Phi Cu(s)$	$E^0_{red}(Cu^{2+}/Cu) = +0.34\ V$
$AgCl(s) + e^- \Phi Ag(s) + Cl^-(aq)$	$E^0_{red}(AgCl/Ag) = +0.22\ V$
$SO_4^{2-}(aq) + 4H^+(aq) + 2e^- \Phi H_2SO_3(aq) + H_2O$	$E^0_{red}(SO_4^{2-}/H_2SO_3) = +0.17\ V$
$2H^+(aq) + 2e^- \Phi H_2(g)$	$E^0_{red}(H^+/H_2) = 0.00\ V$
$Pb^{2+}(aq) + 2e^- \Phi Pb(s)$	$E^0_{red}(Pb^{2+}/Pb) = -0.13\ V$
$Sn^{2+}(aq) + 2e^- \Phi Sn(s)$	$E^0_{red}(Sn^{2+}/Sn) = -0.14\ V$
$Ni^{2+}(aq) + 2e^- \Phi Ni(s)$	$E^0_{red}(Ni^{2+}/Ni) = -0.25\ V$
$Co^{2+}(aq) + 2e^- \Phi Co(s)$	$E^0_{red}(Co^{2+}/Co) = -0.28\ V$
$PbSO_4(s) + 2e^- \Phi Pb(s) + SO_4^{2-}(aq)$	$E^0_{red}(PbSO_4/Pb) = -0.36\ V$
$Cd^{2+}(aq) + 2e^- \Phi Cd(s)$	$E^0_{red}(Cd^{2+}/Cd) = -0.40\ V$
$Fe^{2+}(aq) + 2e^- \Phi Fe(s)$	$E^0_{red}(Fe^{2+}/Fe) = -0.44\ V$
$Cr^{3+}(aq) + 3e^- \Phi Cr(s)$	$E^0_{red}(Cr^{3+}/Cr) = -0.74\ V$
$Zn^{2+}(aq) + 2e^- \Phi Zn(s)$	$E^0_{red}(Zn^{2+}/Zn) = -0.76\ V$
$2H_2O(aq) + 2e^- \Phi H_2(g) + 2OH^-(aq)$	$E^0_{red}(H_2O/H_2) = -0.83\ V$
$Al^{3+}(aq) + 3e^- \Phi Al(s)$	$E^0_{red}(Al^{3+}/Al) = -1.66\ V$
$Mg^{2+}(aq) + 2e^- \Phi Mg(s)$	$E^0_{red}(Mg^{2+}/Mg) = -2.37\ V$
$Na^+(aq) + e^- \Phi Na(s)$	$E^0_{red}(Na^+/Na) = -2.71\ V$
$Ca^{2+}(aq) + 2e^- \Phi Ca(s)$	$E^0_{red}(Ca^{2+}/Ca) = -2.76\ V$
$K^+(aq) + e^- \Phi K(s)$	$E^0_{red}(K^+/K) = -2.92\ V$
$Li^+(aq) + e^- \Phi Li(s)$	$E^0_{red}(Li^+/Li) = -3.05\ V$

UNIVERSITY OF SOUTH AFRICA UNISA university of south africa **UNIVERSITEIT VAN SUID-AFRIKA**

EXAMINATION MARK READING SHEET — EKSAMEN-MERKLEESBLAD

PART 1 (GENERAL/ALGEMEEN) DEEL 1

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

2 PAPER NUMBER / VRAESTELNOMMER

3 INITIALS AND SURNAME / VOORLETTERS EN VAN

4 DATE OF EXAMINATION / DATUM VAN EKSAMEN

5 EXAMINATION CENTRE (E G PRETORIA) / EKSAMENSENTRUM (BV PRETORIA)

6 STUDENT NUMBER / STUDENTENOMMER

7 (0 1 2 3 4 5 6 7 8 9)

8 UNIQUE PAPER NO / UNIEKE VRAESTEL NR

9 (0 1 2 3 4 5 6 7 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	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

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