UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION 2010/11

TITLE OF PAPER: INTRODUCTORY CHEMISTRY II

COURSE NUMBER: C112

TIME: THREE (3) HOURS

INSTRUCTIONS:

(i) Answer **all questions** in section A (total 40 marks)
(ii) Answer **any 3 questions** in section B (Each question is 20 marks)

Non-programmable electronic calculators may be used.

A data sheet, a periodic table and answer sheet for section A are attached

Useful data and equations

1 atm = 760 Torr = 760 mmHg
1 atm = 101325 Pa

Arrhenius equation: $k = Ae^{-E_a/RT}$. or $\ln k = \ln A - \dfrac{E_a}{RT}$

Van der Waals equation: $P = \dfrac{nRT}{V - nb} - \dfrac{n^2 a}{V^2}$

DO NOT OPEN THIS PAPER UNTIL PERMISSION TO DO SO IS GRANTED BY THE CHIEF INVIGILATOR.

SECTION A (40 Marks)

This section consists of multiple choice questions. Correct answer must be indicated by putting a circle around the letter for that answer on the answer sheet provided. If you change your answer, please cancel the wrong answer with a cross and then put a circle around the correct one. If more than one option has a circle around it a zero will be given for that question. Attempt all 40 questions.

1. The value of $\Delta H°$ for the reaction below is -126 kJ. _____ kJ are released when 2.00 mol of NaOH is formed in the reaction?

$$2Na_2O_2(s) + 2H_2O(l) \rightarrow 4NaOH(s) + O_2(g)$$
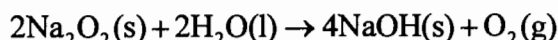
   (A) 252   (B) 63   (C) 3.9   (D) 7.8   (E) -126

2. A sample of a gas (5.0 mol) at 1.0 atm is expanded at constant temperature from 10 L to 15 L. The final pressure is _____ atm.

   (A) 1.5   (B) 7.5   (C) 0.67   (D) 3.3   (E) 15

3. The value of K_{eq} for the equilibrium

$$H_2(g) + I_2(g) \rightleftharpoons 2\,HI(g)$$
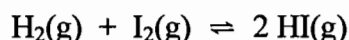
   is 794 at 25 °C. At this temperature, what is the value of K_{eq} for the equilibrium below?

$$HI(g) \rightleftharpoons \tfrac{1}{2}\,H_2(g) + \tfrac{1}{2}\,I_2(g)$$
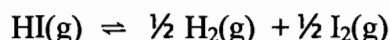
   (A) 1588   (B) 28   (C) 397   (D) 0.035   (E) 0.0013

4. What is the conjugate acid of NH_3?

   (A) NH_3 (B) NH_2^+ (C) NH_3^+ (D) NH_4^+ (E) NH_4OH

5. The simplest alkyne is _____.
   (A) ethylene   (B) ethane   (C) acetylene   (D) propyne   (E) benzene

6. A chemical reaction that absorbs heat from the surroundings is said to be _____ and has a _____ ΔH at constant pressure.
   (A) endothermic, positive   (B) endothermic, negative   (C) exothermic, negative
   (D) exothermic, positive   (E) exothermic, neutral

7. A flask contains a mixture of He and Ne at a total pressure of 2.6 atm. There are 2.0 mol of He and 5.0 mol of Ne in the flask. The partial pressure of He is _____ atm.
   (A) 9.1   (B) 6.5   (C) 1.04   (D) 0.74   (E) 1.86

8. Alkenes always contain a _____.
   (A) C=C bond   (B) C≡C bond   (C) C-C bond   (D) C=H bond
   (E) C≡H bond

9. Hydrocarbons containing only single bonds between the carbon atoms are called _____.
   (A) alkenes   (B) alkynes   (C) aromatics   (D) alkanes   (E) ketones

2

10. The equilibrium expression for Kp for the reaction below is _____.

$$2\,O_3(g) \rightleftharpoons 3\,O_2(g)$$
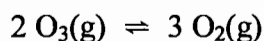
(A) $\dfrac{3P_{O_2}}{2P_{O_3}}$ (B) $\dfrac{2P_{O_3}}{3P_{O_2}}$ (C) $\dfrac{3P_{O_3}}{2P_{O_2}}$ (D) $\dfrac{P_{O_3}{}^2}{P_{O_2}{}^3}$ (E) $\dfrac{P_{O_2}{}^3}{P_{O_3}{}^2}$

11. A balloon originally had a volume of 4.39 L at 44 °C and a pressure of 729 torr. The balloon must be cooled to _____°C to reduce its volume to 3.78 L (at constant pressure).

    (A) 38   (B) 0   (C) 72.9   (D) 273   (E) 546

12. The rate constant for a second-order reaction is $0.13\ M^{-1}s^{-1}$. If the initial concentration of reactant is 0.26 mol/L it takes _____ s for the concentration to decrease to 0.13 mol/L.

    (A) 0.017   (B) 0.50   (C) 1.0   (D) 30   (E) 4.4×10^{-3}

13. The equilibrium constant for the gas phase reaction

$$2\,NH_3(g) \rightleftharpoons N_2(g) + 3\,H_2(g)$$
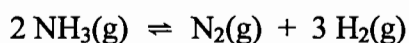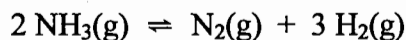
    is $K_{eq} = 230$ at 300 °C. At equilibrium, _____.
    (A) products predominate   (B) reactants predominate
    (C) roughly equal amounts of products and reactants are present
    (D) only products are present   (E) only reactants are present

14. The units of of heat capacity are _____.
    (A) K/J or °C/J   (B) J/K or J/ °C   (C) J/g-K or J/g- °C   (D) J/mol
    (E) g-K/J or g- °C/J

15. Consider the following reaction at equilibrium:
$$2\,NH_3(g) \rightleftharpoons N_2(g) + 3\,H_2(g)$$
    Le Chatelier's principle predicts that the moles of H_2 in the reaction container will increase with _____.
    (A) some removal of NH_3 from the reaction vessel (V and T constant)
    (B) a decrease in the total pressure (T constant)
    (C) addition of some N_2 to the reaction vessel (V and T constant)
    (D) a decrease in the total volume of the reaction vessel (T constant)
    (E) an increase in total pressure by the addition of helium gas (V and T constant)

16. Cyclohexane has _____ fewer hydrogens than n-hexane.
    (A) 0   (B) 1   (C) 2   (D) 3   (E) 4

17. Of the following, $\Delta H_f{}^\circ$ is <u>not</u> zero for _____.
    (A) $O_2(g)$ (B) C (graphite)   (C) $N_2(g)$ (D) $F_2(s)$ (E) $Cl_2(g)$

18. What is the pH of an aqueous solution at 25.0 °C that contains 3.98×10^{-9}M hydronium ion?

   (A) 8.400   (B) 5.600   (C) 9.000   (D) 3.980   (E) 7.000

19. A gas in a 325 mL container has a pressure of 695 torr at 19 °C. There are _____ mol of gas in the flask.

   (A) 1.24×10^{-2} (B) 1.48×10^{-2} (C) 9.42   (D) 12.4   (E) 80.6

20. A reaction was found to be second order in carbon monoxide concentration. The rate of the reaction _____ if the $[CO]$ is doubled, with everything else kept the same.

   (A) doubles   (B) remains unchanged   (C) triples
   (D) increases by a factor of 4   (E) is reduced by a factor of 2

21. How many structural isomers of pentane exist?
   (A) 2   (B) 3   (C) 4   (D) 5   (E) 6

22. For which one of the following reactions is the value of ΔH°_{rxn} equal to ΔH°_{f} for the product?

   (A) $2C\,(s, graphite) + 2H_2(g) \rightarrow C_2H_4(g)$ (B) $N_2(g) + O_2(g) \rightarrow 2NO(g)$
   (C) $2H_2(g) + O_2(g) \rightarrow 2H_2O(l)$ (D) $2H_2(g) + O_2(g) \rightarrow 2H_2O(g)$
   (E) $H_2O(l) + 1/2O_2(g) \rightarrow H_2O_2(l)$

23. If 50.75 g of a gas occupies 10.0 L at STP, 129.3 g of the gas will occupy _____ L at STP.
   (A) 3.92   (B) 50.8   (C) 12.9   (D) 25.5   (E) 5.08

24. At elevated temperatures, dinitrogen pentoxide decomposes to nitrogen dioxide and oxygen:

   $$2N_2O_5(g) \rightarrow 4NO_2(g) + O_2(g)$$

   When the rate of formation of NO_2 is 5.5×10^{-4} M/s, the rate of decomposition of N_2O_5 is _____ M/s.

   (A) 2.2×10^{-3} (B) 1.4×10^{-4} (C) 10.1×10^{-4} (D) 2.8×10^{-4}
   (E) 5.5×10^{-4}

25. What is the concentration (in M) of hydronium ions in a solution at 25.0 °C with pH = 4.282?

   (A) 4.28   (B) 9.71   (C) 1.92×10^{-10} (D) 5.22×10^{-5} (E) 1.66×10^{4}

26. The compound below is an _____.

```
         H   H
         |   |
H — C ≡ C — C — H
         |   |
         H   H
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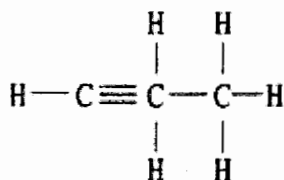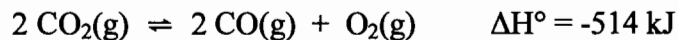
   (A) alkyne   (B) alkene   (C) alkane   (D) aromatic compound   (E) olefin

27. The energy released by combustion of 1 g of a substance is called the _____ of the

substance.
    (A) specific heat   (B) fuel value   (C) nutritional calorie content
    (D) heat capacity   (E) enthalpy

28. The volume of 0.65 mol of an ideal gas at 365 torr and 97 °C is _____ L.
    (A) 0.054   (B) 9.5   (C) 11   (D) 41   (E) 2.4×10^{-2}

29. Consider the following reaction at equilibrium.
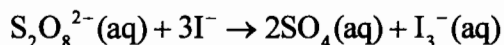$$2\,CO_2(g) \rightleftharpoons 2\,CO(g) + O_2(g) \qquad \Delta H° = -514\,kJ$$
Le Chatelier's principle predicts that the equilibrium partial pressure of CO (g) can be maximized by carrying out the reaction _____.
    (A) at high temperature and high pressure
    (B) at high temperature and low pressure
    (C) at low temperature and low pressure
    (D) at low temperature and high pressure
    (E) in the presence of solid carbon

Information for questions 30, 31 and 32

The peroxydisulphate ion $(S_2O_8^{2-})$ reacts with the iodide ion in aqueous solution via the reaction:
$$S_2O_8^{2-}(aq) + 3I^- \rightarrow 2SO_4(aq) + I_3^-(aq)$$
An aqueous solution containing 0.050 M of $S_2O_8^{2-}$ ion and 0.072 M of I^- is prepared, and the progress of the reaction followed by measuring $[I^-]$. The data obtained is given in the table below.

Time (s)	0.000	400.0	800.0	1200.0	1600.0
[I⁻] (M)	0.072	0.057	0.046	0.037	0.029

30. The average rate of disappearance of I^- between 400.0 s and 800.0 s is _____ M/s.
    (A) 2.8×10^{-5} (B) 1.4×10^{-5} (C) 5.8×10^{-5} (D) 3.6×10^4
    (E) 2.6×10^{-4}

31. The concentration of $S_2O_8^{2-}$ remaining at 400 s is _____ M.
    (A) +0.015   (B) +0.035   (C) −0.007   (D) +0.045   (E) +0.057

32. The concentration of $S_2O_8^{2-}$ remaining at 1600 s is _____ M.
    (A) 0.036   (B) 0.014   (C) 0.043   (D) 0.064   (E) 0.029

33. The name of $CH_3\text{-}CH\text{=}C\text{=}CH\text{-}CH\text{-}CH\text{=}CH\text{-}CH_3$ is _____.
    (A) 2, 3, 5 - octatriene   (B) 2, 5, 6 - octatriene   (C) 2, 3, 6 - octatriene
    (D) 3, 5, 6 - octatriene   (E) 3, 4, 7 - octatriene

34. A sample of H_2 gas (12.28 g) occupies 100.0 L at 400.0 K and 2.00 atm. A sample weighing 9.49 g occupies _____ L at 353 K and 2.00 atm.
    (A) 109   (B) 68.2   (C) 54.7   (D) 147   (E) 77.3

35. A second-order reaction has a half-life of 18 s when the initial concentration of reactant is 0.71 M. The rate constant for this reaction is _____ $M^{-1}s^{-1}$.
   (A) 7.8×10^{-2} (B) 3.8×10^{-2} (C) 2.0×10^{-2} (D) 1.3   (E) 18

36. Aromatic hydrocarbons _____.
   (A) readily undergo addition reactions like alkenes
   (B) contain a series of π bonds on several consecutive carbon atoms
   (C) undergo substitution reactions more easily than saturated hydrocarbons
   (D) have sp^2 hybridized carbon atoms
   (E) None of the above

37. A gas mixture of Ne and Ar has a total pressure of 4.00 atm and contains 16.0 mol of gas. If the partial pressure of Ne is 2.75 atm, how many moles of Ar are in the mixture?
   (A) 11.0   (B) 5.00   (C) 6.75   (D) 9.25   (E) 12.0

38. The kinetics of the reaction below were studied and it was determined that the reaction rate did not change when the concentration of B was tripled. The reaction is _____ order in B.
   $$A + B \rightarrow P$$
   (A) zero   (B) first   (C) second   (D) third   (E) one-half

39. $CH_3CH_2C(=O)NH_2$ is called a(n) _____.
   (A) amine   (B) amide   (C) ketone   (D) aldehyde   (E) ester

40. A reaction was found to be third order in A. Increasing the concentration of A by a factor of 3 will cause the reaction rate to _____.
   (A) remain constant   (B) increase by a factor of 27   (C) increase by a factor of 9
   (D) triple   (E) decrease by a factor of the cube root of 3

Please insert your answer sheet inside the answer book used for section B.

6

SECTION B (60 Marks)

There are four questions in this section. Each question is worth 20 marks. Answer any three questions. In all calculations answers must have the correct number of significant figures.

Question 1 (20 marks)

(a) Using appropriate examples explain
   (i)   the difference between a straight chain and a branched chain alkane.
   (ii)   An alkane and an alkyl group
   (iii) A saturated and an unsaturated hydrocarbon.   [6]

(b) Indicate whether each of the following molecules is capable of geometrical (cis-trans) isomerism. For those that are, draw the structures:
   (i) 1,1-dichloro-1-butene   (ii) 2,4-dichloro-2-butene
   (iii) 1,4-dichloro-benzene   (iv) 4,4-dimethy-2-pentyne   [4]

(c) Using condensed structural formulas, write a balanced chemical equations for each of the following reactions:
   (i)   2- pentene with Br_2
   (ii) Cl_2 with benzene in presence of $FeCl_3$.   [4]

(d) Give the structural formula of
   (i)   3-methy-2-butanone
   (ii)   2-methyl pentanal   [2]

(e) Draw the structural formula of the compound formed by the condensation reactions between
   (i)   benzoic acid and ethanol
   (ii)   propanoic acid and dimethylamine   [4]

Question 2 (20 marks)

(a) The specific heat of liquid bromine is 0.226 J/g-K. How much heat (J) is required to raise the temperature of 10.0 mL of bromine from 25.00 °C to 27.30 °C? The density of liquid bromine: 3.12 g/mL.   [5]

(b) Given the following reactions
$$N_2(g) + 2O_2(g) \rightarrow 2NO_2(g) \quad \Delta H = 66.4 \text{ kJ}$$
$$2NO(g) + O_2(g) \rightarrow 2NO_2(g) \quad \Delta H = -114.2 \text{ kJ}$$

Calculate the enthalpy of the reaction of the nitrogen to produce nitric oxide
$$N_2(g) + O_2(g) \rightarrow 2NO(g)$$ [5]

(c)   Given the data in the table below, calculate ΔH°_{rxn} for the reaction

$$4NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(l)$$ [5]
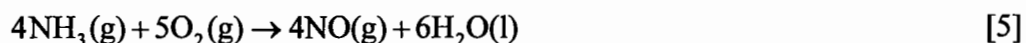
Substance	ΔH°_f (kJ/mol)
$H_2O(l)$	-286
$NO(g)$	90
$NO_2(g)$	34
$NH_3(g)$	-46

(d)   At 22 °C, $K_p = 0.070$ for the equilibrium:

$$NH_4HS(s) \rightleftharpoons NH_3(g) + H_2S(g)$$

A sample of solid NH_4HS is placed in a closed container and allowed to equilibrate at 22 °C. Calculate the equilibrium partial pressure (atm) of ammonia, assuming some solid NH_4HS remains.   [5]

Question 3 (20 marks)

(a)   A particular first-order reaction has a rate constant of 1.35×10^2 s^{-1} at 25.0 °C. What is the magnitude of k at 75.0 °C if E_a = 85.6 kJ/mol?   [5]

(b)   Hydrogen sulphide, H_2S, is a common pollutant in industrial wastewaters. One way to remove it is to reactant the water with chlorine, in which case the following reaction occurs:

$$H_2S(aq) + Cl_2(aq) \rightarrow S(s) + 2 HCl(aq)$$

The rate of this reaction is first order with respect to each reactant. The rate constant for the disappearance of H_2S at 28 °C is 3.5×10^{-2} M^{-1} s^{-1}. If at a given time the concentration of H_2S is 2.0×10^{-4} M and that of Cl_2 is 0.025 M, what is the rate of formation of HCl?   [5]

(c)   The K_a of hydrofluoric acid (HF) at 25.0 °C is 6.8×10^{-4}. What is the pH of a 0.35 M aqueous solution of HF?   [5]

(d)   The K_a for HCN is 4.9×10^{-10}. What is the pH of a 0.068 M aqueous solution of sodium cyanide?   [5]

8

Question 4 (20 marks)

(a) Calculate the density of fluorine (F_2) gas at 25 °C and 60. kPa..   [5]

(b) Calculate the volume of fluorine gas required to react with 2.67 g of calcium bromide to form calcium fluoride and bromine at 41.0 °C and 4.31 atm.   [5]

(c) A sample of H_2 gas (2.0 L) at 3.5 atm was combined with 1.5 L of N_2 gas at 2.6 atm pressure at a constant temperature of 25 °C into a 7.0 L flask. What is the final total pressure (atm) in the flask?. Assume the initial pressure in the flask was 0.00 atm and the temperature upon mixing was 25 °C.   [5]

(d) Using the van der Waals equation, calculate the pressure (atm) in a 22.4 L vessel containing 1.00 mol of neon gas at 100 °C.
(a = 0.211 L^2 atm mol^{-2}, b = 0.0171 L mol^{-1})   [5]

9

General data and fundamental constants

Quantity	Symbol	Value
Speed of light	c	$2.997\ 924\ 58 \times 10^8$ m s^{-1}
Elementary charge	e	$1.602\ 177 \times 10^{-19}$ C
Faraday constant	$F = N_A e$	9.6485×10^4 C mol^{-1}
Boltzmann constant	k	$1.380\ 66 \times 10^{-23}$ J K^{-1}
Gas constant	$R = N_A k$	$8.314\ 51$ J K^{-1} mol^{-1}
		$8.205\ 78 \times 10^{-2}$ dm^3 atm K^{-1} mol^{-1}
		6.2364×10 L Torr K^{-1} mol^{-1}
Planck constant	h	$6.626\ 08 \times 10^{-34}$ J s
	$\hbar = h/2\pi$	$1.054\ 57 \times 10^{-34}$ J s
Avogadro constant	N_A	$6.022\ 14 \times 10^{23}$ mol^{-1}
Atomic mass unit	u	$1.660\ 54 \times 10^{-27}$ Kg
Mass		
electron	m_e	$9.109\ 39 \times 10^{-31}$ Kg
proton	m_p	$1.672\ 62 \times 10^{-27}$ Kg
neutron	m_n	$1.674\ 93 \times 10^{-27}$ Kg
Vacuum permittivity	$\varepsilon_0 = 1/c^2\mu_0$	$8.854\ 19 \times 10^{-12}$ J^{-1} C^2 m^{-1}
	$4\pi\varepsilon_0$	$1.112\ 65 \times 10^{-10}$ J^{-1} C^2 m^{-1}
Vacuum permeability	μ_0	$4\pi \times 10^{-7}$ J s^2 C^{-2} m^{-1}
		$4\pi \times 10^{-7}$ T^2 J^{-1} m^3
Magneton		
Bohr	$\mu_B = e\hbar/2m_e$	$9.274\ 02 \times 10^{-24}$ J T^{-1}
nuclear	$\mu_N = e\hbar/2m_p$	$5.050\ 79 \times 10^{-27}$ J T^{-1}
g value	g_e	$2.002\ 32$
Bohr radius	$a_0 = 4\pi\varepsilon_0\hbar/m_e e^2$	$5.291\ 77 \times 10^{-11}$ m
Fine-structure constant	$\alpha = \mu_0 e^2 c/2h$	$7.297\ 35 \times 10^{-3}$
Rydberg constant	$R_\infty = m_e e^4/8h^3 c\varepsilon_0^2$	$1.097\ 37 \times 10^7$ m^{-1}
Standard acceleration of free fall	g	$9.806\ 65$ m s^{-2}
Gravitational constant	G	$6.672\ 59 \times 10^{-11}$ N m^2 Kg^{-2}

Conversion factors

1 cal	=	4.184 joules (J)	1 erg	=	1×10^{-7} J
1 eV	=	$1.602\ 2 \times 10^{-19}$ J	1 eV/molecule	=	96 485 kJ mol^{-1}

Prefixes

f	p	n	μ	m	c	d	k	M	G
femto	pico	nano	micro	milli	centi	deci	kilo	mega	giga
10^{-15}	10^{-12}	10^{-9}	10^{-6}	10^{-3}	10^{-2}	10^{-1}	10^3	10^6	10^9

PERIODIC TABLE OF ELEMENTS

GROUPS

Legend:
- Atomic mass → (e.g. 10.811)
- Symbol → B
- Atomic No. → 5

PERIODS	1 IA	2 IIA	3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8 VIIIB	9 VIIIB	10 VIIIB	11 IB	12 IIB	13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	18 VIIIA
1	1.008 H 1																	4.003 He 2
2	6.941 Li 3	9.012 Be 4											10.811 B 5	12.011 C 6	14.007 N 7	15.999 O 8	18.998 F 9	20.180 Ne 10
3	22.990 Na 11	24.305 Mg 12											26.982 Al 13	28.086 Si 14	30.974 P 15	32.06 S 16	35.453 Cl 17	39.948 Ar 18
4	39.098 K 19	40.078 Ca 20	44.956 Sc 21	47.88 Ti 22	50.942 V 23	51.996 Cr 24	54.938 Mn 25	55.847 Fe 26	58.933 Co 27	58.69 Ni 28	63.546 Cu 29	65.39 Zn 30	69.723 Ga 31	72.61 Ge 32	74.922 As 33	78.96 Se 34	79.904 Br 35	83.80 Kr 36
5	85.468 Rb 37	87.62 Sr 38	88.906 Y 39	91.224 Zr 40	92.906 Nb 41	95.94 Mo 42	98.907 Tc 43	101.07 Ru 44	102.91 Rh 45	106.42 Pd 46	107.87 Ag 47	112.41 Cd 48	114.82 In 49	118.71 Sn 50	121.75 Sb 51	127.60 Te 52	126.90 I 53	131.29 Xe 54
6	132.91 Cs 55	137.33 Ba 56	138.91 *La 57	178.49 Hf 72	180.95 Ta 73	183.85 W 74	186.21 Re 75	190.2 Os 76	192.22 Ir 77	195.08 Pt 78	196.97 Au 79	200.59 Hg 80	204.38 Tl 81	207.2 Pb 82	208.98 Bi 83	(209) Po 84	(210) At 85	(222) Rn 86
7	223 Fr 87	226.03 Ra 88	(227) **Ac 89	(261) Rf 104	(262) Ha 105	(263) Unh 106	(262) Uns 107	(265) Uno 108	(266) Une 109	(267) Uun 110								

TRANSITION ELEMENTS

*Lanthanide Series

140.12 Ce 58	140.91 Pr 59	144.24 Nd 60	(145) Pm 61	150.36 Sm 62	151.96 Eu 63	157.25 Gd 64	158.93 Tb 65	162.50 Dy 66	164.93 Ho 67	167.26 Er 68	168.93 Tm 69	173.04 Yb 70	174.97 Lu 71

**Actinide Series

232.04 Th 90	231.04 Pa 91	238.03 U 92	237.05 Np 93	(244) Pu 94	(243) Am 95	(247) Cm 96	(247) Bk 97	(251) Cf 98	(252) Es 99	(257) Fm 100	(258) Md 101	(259) No 102	(260) Lr 103

( ) indicates the mass number of the isotope with the longest half-life.

UNIVERSITY OF SWAZILAND

C112 SECTION A ANSWER SHEET

STUDENT ID NUMBER:_____

Correct answer must be indicated by putting a circle around the letter for that answer on the answer sheet provided. If you change your answer, please cancel the wrong answer with a cross and then put a circle around the correct one. If more than one option has a circle around it a zero will be given for that question.

1.	(A)	(B)	(C)	(D)	(E)		21.	(A)	(B)	(C)	(D)	(E)
2	(A)	(B)	(C)	(D)	(E)		22	(A)	(B)	(C)	(D)	(E)
3	(A)	(B)	(C)	(D)	(E)		23	(A)	(B)	(C)	(D)	(E)
4	(A)	(B)	(C)	(D)	(E)		24	(A)	(B)	(C)	(D)	(E)
5	(A)	(B)	(C)	(D)	(E)		25	(A)	(B)	(C)	(D)	(E)
6	(A)	(B)	(C)	(D)	(E)		26	(A)	(B)	(C)	(D)	(E)
7	(A)	(B)	(C)	(D)	(E)		27	(A)	(B)	(C)	(D)	(E)
8	(A)	(B)	(C)	(D)	(E)		28	(A)	(B)	(C)	(D)	(E)
9	(A)	(B)	(C)	(D)	(E)	.	29	(A)	(B)	(C)	(D)	(E)
10	(A)	(B)	(C)	(D)	(E)		30	(A)	(B)	(C)	(D)	(E)
11	(A)	(B)	(C)	(D)	(E)		31	(A)	(B)	(C)	(D)	(E)
12	(A)	(B)	(C)	(D)	(E)		32	(A)	(B)	(C)	(D)	(E)
13	(A)	(B)	(C)	(D)	(E)		33	(A)	(B)	(C)	(D)	(E)
14	(A)	(B)	(C)	(D)	(E)		34	(A)	(B)	(C)	(D)	(E)
15	(A)	(B)	(C)	(D)	(E)		35	(A)	(B)	(C)	(D)	(E)
16	(A)	(B)	(C)	(D)	(E)		36	(A)	(B)	(C)	(D)	(E)
17	(A)	(B)	(C)	(D)	(E)	.	37	(A)	(B)	(C)	(D)	(E)
18	(A)	(B)	(C)	(D)	(E)		38	(A)	(B)	(C)	(D)	(E)
19	(A)	(B)	(C)	(D)	(E)		39	(A)	(B)	(C)	(D)	(E)
20	(A)	(B)	(C)	(D)	(E)		40	(A)	(B)	(C)	(D)	(E)