UNIVERSITY OF SWAZILAND

FINAL 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 $\ln k = \ln A - \frac{E_a}{RT}$

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

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.

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1. The value of $\Delta H°$ for the reaction below is -72 kJ. _____ kJ of heat are released when 1.0 mol of HBr is formed in this reaction.

$$H_2(g) + Br_2(g) \rightarrow 2HBr(g)$$

(A) 144 (B) 72 (C) 0.44 (D) 36 (E) -72

2. Nitrogen dioxide decomposes to nitric oxide and oxygen via the reaction:

$$2NO_2 \rightarrow 2NO + O_2$$

In a particular experiment at 300 °C, $[NO_2]$ drops from 0.0100 to 0.00650 M in 100s The rate of appearance of O_2 for this period is _____ M/s.

(A) 1.8×10^{-5} (B) 3.5×10^{-5} (C) 7.0×10^{-5} (D) 3.5×10^{-3}
(E) 7.0×10^{-3}

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

$$H_2(g) + I_2(g) \rightleftharpoons 2\,HI(g)$$

is 794 at 25 °C. What is the value of K_{eq} for the equilibrium below?

$$\tfrac{1}{2}\,H_2(g) + \tfrac{1}{2}\,I_2(g) \rightleftharpoons HI(g)$$

(A) 397 (B) 0.035 (C) 28 (D) 1588 (E) 0.0013

4. The conjugate base of HSO_4^- is _____.

(A) OH^- (B) H_2SO_4 (C) SO_4^{2-} (D) HSO_4^+ (E) $H_3SO_4^+$

5. Hydrocarbons containing carbon-carbon triple bonds are called _____.

(A) alkanes (B) aromatic hydrocarbons (C) alkynes
(D) alkenes (E) olefins

6. The value of $\Delta H°$ for the reaction below is -336 kJ. Calculate the heat (kJ) released to the surroundings when 23.0 g of HCl is formed.

$$CH_4(g) + 3Cl_2(g) \rightarrow CHCl_3(l) + 3HCl(g)$$

(A) 177 (B) 2.57×10^3 (C) 70.7 (D) 211 (E) -336

7. Which substance in the reaction below either appears or disappears the fastest?

$$4NH_3 + 7O_2 \rightarrow 4NO_2 + 6H_2O$$

(A) NH_3 (B) O_2 (C) NO_2 (D) H_2O
(E) The rates of appearance/disappearance are the same for all of these.

8. Hybridization of the carbon atom indicated by (*) in CH_3-$^*CH_2$-CH_3, $^*CH{=}CH_2$, and CH_3-$^*C \equiv CH$ is _____, _____, and _____, respectively.

(A) sp^3, sp^2, sp (B) sp^3, sp, sp^2 (C) sp, sp^2, sp^3 (D) sp, sp^3, sp^2
(E) sp^2, sp^3, sp

9. If 3.21 mol of a gas occupies 56.2 L at 44 °C and 793 torr, 5.29 mol of this gas occupies _____ L under these conditions.

(A) 14.7 (B) 61.7 (C) 30.9 (D) 92.6 (E) 478

10. Which one of the following will change the value of an equilibrium constant?

(A) changing temperature
(B) adding other substances that do not react with any of the species involved in the equilibrium
(C) varying the initial concentrations of reactants
(D) varying the initial concentrations of products
(E) changing the volume of the reaction vessel

11. In the reaction below, ΔH_f° is zero for _____.

$$Ni(s) + 2CO(g) + 2PF_3(g) \rightarrow Ni(CO)_2(PF_3)_2(l)$$

(A) Ni(s) (B) CO(g) (C) $PF_3(g)$ (D) $Ni(CO)_2(PF_3)_2(l)$
(E) both CO(s) and $PF_3(g)$

12. If the rate law for the reaction $2A + 3B \rightarrow$ products, is first order in A and second order in B, then the rate law is rate = _____.

(A) $k[A][B]$ (B) $k[A]^2[B]^3$ (C) $k[A][B]^2$ (D) $k[A]^2[B]$
(E) $k[A]^2[B]^2$

13. What is the pH of an aqueous solution at 25.0 °C in which $[OH^-]$ is 0.0025 M?

(A) +2.60 (B) -2.60 (C) +11.4 (D) -11.4 (E) -2.25

14. A mixture of He and Ne at a total pressure of 0.95 atm is found to contain 0.32 mol of He and 0.56 mol of Ne. The partial pressure of Ne is _____ atm.

(A) 1.7 (B) 1.5 (C) 0.60 (D) 0.35 (E) 1.0

15. Which of the following expressions is the correct equilibrium-constant expression for the equilibrium between dinitrogen tetroxide and nitrogen dioxide?

$$N_2O_4(g) \rightleftharpoons 2\,NO_2(g)$$

(A) $\dfrac{[NO_2]}{[N_2O_4]}$ (B) $\dfrac{[NO_2]^2}{[N_2O_4]}$ (C) $\dfrac{[NO_2]}{[N_2O_4]^2}$
(D) $[NO_2]\,[N_2O_4]$ (E) $[NO_2]^2\,[N_2O_4]$

16. Which one of the following is <u>not</u> an alcohol?

(A) acetone (B) glycerol (C) ethanol (D) cholesterol (E) ethylene glycol

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

(A) $H_2O(l)+1/2O_2(g)\rightarrow H_2O_2(l)$ (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) none of the above

Information for questions 18, 19 and 20

A flask is charged with 0.124 mol of A and allowed to react to form B according to the reaction A(g) →B(g). The following data are obtained for [A] as the reaction proceeds:

Time(s)	0.00	10.0	20.0	30.0	40.0
Moles of A	0.124	0.110	0.088	0.073	0.054

18. The average rate of disappearance of A between 10 s and 20 s is _____ mol/s.

(A) 2.2×10^{-3} (B) 1.1×10^{-3} (C) 4.4×10^{-3} (D) 454 (E) 9.90×10^{-3}

19. The average rate of appearance of B between 20 s and 30 s is _____ mol/s.

(A) $+1.5\times10^{-3}$ (B) $+5.0\times10^{-4}$ (C) -1.5×10^{-3} (D) $+7.3\times10^{-3}$

(E) -7.3×10^{-3}

20. How many moles of B are present at 30 s?

(A) 2.4×10^{-3} (B) 0.15 (C) 0.073 (D) 1.7×10^{-3} (E) 0.051

21. Which of the following compounds does <u>not</u> contain a C = O bond?

(A) ketones (B) aldehydes (C) esters (D) amides (E) ethers

22. The kinetics of the reaction A + B → P were studied and it was determined that the reaction rate increased by a factor of 9 when the concentration of B was tripled. The reaction is _____ order in B.

(A) zero (B) first (C) second (D) third (E) one-half

23. Consider the following reaction at equilibrium:

$$2\,CO_2(g) \rightleftharpoons 2\,CO(g) + O_2(g) \qquad \Delta H^\circ = -514\ kJ$$

Le Chatelier's principle predicts that adding $O_2(g)$ to the reaction container will _____.

(A) increase the partial pressure of CO(g) at equilibrium

(B) decrease the partial pressure of $CO_2(g)$ at equilibrium

(C) increase the value of the equilibrium constant

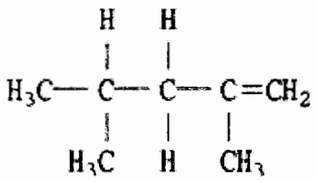
(D) increase the partial pressure of $CO_2(g)$ at equilibrium

(E) decrease the value of the equilibrium constant

24. A sample of gas (1.3 mol) occupies _____ L at 22 °C and 2.5 atm.

(A) 0.079 (B) 0.94 (C) 13 (D) 31 (E) 3.2×10^{-2}

25. What is the name of the compound below?



(A) 2,4-methylbutene (B) 2,5-dimethylpentane (C) 2,4-ethylbutene
(D) 2,4-dimethyl-1-pentene (E) 2,4-dimethyl-4-pentene

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

(A) 4.28 (B) 9.72 (C) 1.91×10^{-10} (D) 5.22×10^{-5} (E) 1.66×10^{4}

27. The value of $\Delta H°$ for the following reaction is -3351 kJ:

$$2Al(s)+3O_2(g)\rightarrow 2Al_2O_3(s)$$

The value of $\Delta H_f°$ for $Al_2O_3(s)$ is _____ kJ.

(A) -3351 (B) -1676 (C) -32.86 (D) -16.43 (E) +3351

28. _____ could be the formula of an alkene.

(A) C_3H_8 (B) C_3H_6 (C) C_6H_6 (D) $C_{17}H_{36}$ (E) CH_8

29. A reaction was found to be zero 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

30. The enthalpy change for the following reaction is -483.6 kJ:

$$2H_2(g)+O_2(g)\rightarrow 2H_2O(g)$$

Therefore, the enthalpy change for the following reaction is _____ kJ:

$$4H_2(g)+2O_2(g)\rightarrow 4H_2O(g)$$

(A) -483.6 (B) -967.2 (C) 2.34×10^{5} (D) 483.6 (E) 967.2

31. The addition of HBr to 2-butene produces _____.

(A) 1-bromobutane (B) 2-bromobutane (C) 1,2-dibromobutane
(D) 2,3-dibromobutane (E) no reaction

32. A gas originally at 27 °C and 1.00 atm pressure in a 3.9 L flask is cooled at constant pressure until the temperature is 11 °C. The new volume of the gas is _____ L.

(A) 0.27 (B) 3.7 (C) 3.9 (D) 4.1 (E) 0.24

33. A first-order reaction has a rate constant of 0.33 min^{-1}. It takes _____ min for the reactant concentration to decrease from 0.13 M to 0.088 M.

(A) 1.2 (B) 1.4 (C) 0.51 (D) 0.13 (E) 0.85

34. Consider the following reaction at equilibrium:

$$2\,CO_2(g) \rightleftharpoons 2\,CO(g) + O_2(g) \qquad \Delta H^\circ = -514\ kJ$$

Le Chatelier's principle predicts that an increase in temperature will _____.

(A) increase the partial pressure of $O_2(g)$

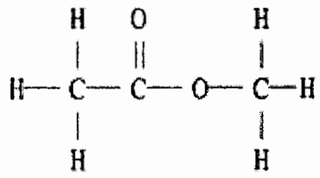
(B) decrease the partial pressure of $CO_2(g)$

(C) decrease the value of the equilibrium constant

(D) increase the value of the equilibrium constant

(E) increase the partial pressure of CO

35. The compound below is a(n) _____.



(A) carboxylic acid (B) ketone (C) aldehyde

(D) ester (E) amine

36. A sample of He gas (2.35 mol) occupies 57.9 L at 300.0 K and 1.00 atm. The volume of this sample is _____ L at 423 K and 1.00 atm.

(A) 0.709 (B) 41.1 (C) 81.6 (D) 1.41 (E) 57.9

37. How many isomers are possible for C_4H_{10}?

(A) 1 (B) 2 (C) 3 (D) 4 (E) 10

38. A vessel contained N_2, Ar, He, and Ne. The total pressure in the vessel was 987 torr. The partial pressures of nitrogen, argon, and helium were 44.0, 486, and 218 torr, respectively. The partial pressure of neon in the vessel was _____ torr.

(A) 42.4 (B) 521 (C) 19.4 (D) 239 (E) 760

39. The half-life of a first-order reaction is 13 min. If the initial concentration of reactant is 0.085 M it takes _____ min for it to decrease to 0.055 M.

(A) 8.2 (B) 11 (C) 3.6 (D) 0.048 (E) 8.4

40. Which one of the following could be a cyclic alkane?

(A) C_5H_5 (B) C_3H_6 (C) C_4H_6 (D) C_2H_6 (E) C_9H_{20}

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

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 and units.

Question 1 (20 marks)

(a) Give the molecular formula of a hydrocarbon containing five carbon atoms that is
(i) an alkane (ii) a cycloalkane (iii) an alkene (iv) an alkyne [4]

(b) Using condensed structural formulas, write a balanced chemical equations for each of the following reactions. In each case name the products.
(i) hydrogenation of cyclohexene
(ii) addition of H_2O to trans-2-pentene using H_2SO_4 as a catalyst (two products) [6]

(c) Give the structural formula of
(i) an aldehyde that is an isomer of acetone
(ii) an ether that is an isomer of 1-propanol
(iii) 2-choro-pentanoic acid [6]

(d) Draw the structural formula of the compound formed by the condensation reactions between
(i) ethanoic acid and methylamine
(ii) acetic acid and phenol [4]

Question 2 (20 marks)

(a) The ΔH for the solution process when solid sodium hydroxide dissolves in water is 44.4 kJ/mol. Calculate the final temperature when a 13.9 g sample of NaOH is dissolved in 250.0 g of water at 23 °C in a coffee-cup calorimeter. Assume that the solution has the same specific heat as liquid water, i.e., 4.18 J/g-K. [5]

(b) Calculate the ΔH for the reaction

$$IF_5(g) \rightarrow IF_3(g) + F_2(g)$$

given the data below.

$$IF(g) + F_2(g) \rightarrow IF_3(g) \quad \Delta H = -390 \text{ kJ}$$

$$IF(g) + 2F_2(g) \rightarrow IF_5(g) \quad \Delta H = -745 \text{ kJ}$$

[5]

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

$$Ca(OH)_2 + 2H_3AsO_4 \rightarrow Ca(H_2AsO_4)_2 + 2H_2O.$$ [5]

Substance	ΔH°_f (kJ/mol)
$Ca(OH)_2$	-986.6
H_3AsO_4	-900.4
$Ca(H_2AsO_4)_2$	-2346.0
H_2O	-285.9

(d) In the coal-gasification process, carbon monoxide is converted to carbon dioxide via the following reaction:

$$CO(g) + H_2O(g) \rightleftharpoons CO_2(g) + H_2(g)$$

In an experiment, 0.35 mol of CO and 0.40 mol of H_2O were placed in a 1.00-L reaction vessel. At equilibrium, there were 0.19 mol of CO remaining. Calculate K_{eq} at the temperature. [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 95.0 °C if E_a = 55.5 kJ/mol? [5]

(b) The reaction $2\ NO(g) + O_2(g) \rightarrow 2\ NO_2(g)$ is second order in NO and first order in O_2. When [NO] = 0.040 M and $[O_2]$ = 0.035 M, the observed rate of disappearance of NO is 9.3×10^{-5} M/s.

(i) What is the rate of disappearance of O_2 at this moment?

(ii) What is the value of the rate constant?

(iii) What would happen to the rate if the concentration of O_2 were increased by a factor of 1.8? [5]

(c) The K_a of hypochlorous acid (HClO) is 3.0×10^{-8} at 25.0 °C. Calculate the pH of a 0.0385 M hypochlorous acid solution. [5]

(d) The K_a for formic acid (HCO_2H) is 1.8×10^{-4}. What is the pH of a 0.35 M aqueous solution of sodium formate ($NaHCO_2$)? ($K_w = 1.0 \times 10^{-14}$) [5]

Question 4 (20 marks)

(a) A sample of gas (1.9 mol) is in a flask at 21 °C and 697 mm Hg. The flask is opened and more gas is added to the flask. The new pressure is 795 mm Hg and the temperature is now 26 °C. Calculate

(i) the volume of the flask

(ii) the final number of moles of gas in the flask. [5]

(b) Calculate the volume of hydrogen gas at 38.0 °C and 763 Torr that can be produced by the reaction of 4.33 g of zinc with excess sulphuric acid. [5]

(c) A sample of He gas (3.0 L) at 5.6 atm and 25 °C was combined with 4.5 L of Ne gas at 3.6 atm and 25 °C at constant temperature in a 9.0 L flask. Calculate the 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 1.50 mol of chlorine gas at 0.00 °C.
(a = 6.49 L^2 atm mol^{-2}, b = 0.0562 L mol^{-1}) [5]

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	$\varepsilon_o = 1/c^2\mu_o$	$8.854\ 19 \times 10^{-12}$ J^{-1} C^2 m^{-1}
	$4\pi\varepsilon_o$	$1.112\ 65 \times 10^{-10}$ J^{-1} C^2 m^{-1}
Vacuum permeability	μ_o	$4\pi \times 10^{-7}$ 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	$a_o = 4\pi\varepsilon_o\hbar/m_e e^2$	$5.291\ 77 \times 10^{-11}$ m
Fine-structure constant	$\alpha = \mu_o e^2 c/2h$	$7.297\ 35 \times 10^{-3}$
Rydberg constant	$R_\infty = m_e e^4/8h^3 c\varepsilon_o^2$	$1.097\ 37 \times 10^{7}$ 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

PERIODS	1 IA	2 IIA	3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8	9 VIIIB	10	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								

Atomic mass → 10.811
Symbol → B
Atomic No. → 5

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)