All Ireland Linguistics Olympiad

AILO

2009

INDIVIDUAL COMPETITION

April 27, 2009
10 am to 1 pm

ANSWERBOOK

Student's name ……………………………………….

School …………………………………….

For examiners' use: do not write in this area		
A	20	
B	10	
C	20	
D	25	
E	5	
F	20	
Total	100	

Question A: Tenji karaoke (20 points)

Braille is a tactile writing system, based on a series of raised dots, that is widely used by the blind. It was invented in 1821 by Louis Braille to write French, but has since been adapted to many other languages. English, which uses the Roman alphabet just as French does, required very little adaptation, but languages that do not use the Roman alphabet, such as Japanese, Korean, or Chinese, are often organized in a very different manner!

To the right is a Japanese word written in the *tenji* ("dot characters") writing system. The large dots represent the raised bumps; the tiny dots represent empty positions.

karaoke

A1. The following *tenji* words represent ***atari, haiku, katana, kimono, koi,*** and ***sake***. Which is which? You don't need to know either Japanese or Braille to figure it out; you'll find that the system is highly logical. (1 point for each right answer)

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

A2. What are the following words? (3 points each)

g. _____

h. _____

A3. Write the following words in *tenji* characters. (7 points)

i. samurai _____

j. miso _____

Question B: Nok-nok! (10 points)

Christopher Robin is the most educated friend of Winnie-the-Pooh, and he can spell a lot of simple words, and even some long and delicate words, but unfortunately he often spells them incorrectly. For example, he has helped Owl to write the following two notices on the door of Owl's residence at The Chestnuts:

Plez ring if an rnser is reqird.		Plez cnoke if an rnsr is not reqid.

Although Owl is very proud of these notices, he is also concerned that some of his friends may not understand them; in fact, even Owl himself finds the notices a bit confusing.

To help Christopher Robin with his spelling, Winnie-the-Pooh and Owl have bought him an electronic spelling tutor, which pronounces various words and asks the user to spell them. If the user makes a mistake, the tutor shows the correct spelling, along with a comment on the accuracy of the user's spelling; it uses four comments: *almost right*, *quite close*, *a bit confusing*, and *very confusing*. For instance, Christopher Robin has received the following feedback during his initial experiments with the tutor:

Christopher Robin's spelling	*Correct spelling*	*Comment*
flocinaucinihilipilification	loccinaucinihilipilification	almost right
owll	owl	almost right
pseudopseudohipoparathyroidism	pseudopseudohypoparathyroidism	almost right
ples	please	quite close
reqird	required	quite close
rnser	answer	quite close
antidisestablishmentaraniasm	antidisestablishmentarianism	quite close
wol	owl	quite close
humuhumunukunukuapuaua'a	humuhumunukunukuapua'a	quite close
plez	please	a bit confusing
cnoke	knock	a bit confusing
rnsr	answer	a bit confusing
reqid	required	a bit confusing

pneumonoultramicroscopic-
   cilikovolkanokoniosis
	pneumonoultramicroscopic-
	   silicovolcanokoniosis
		a bit confusing

mispeln	misspelling	very confusing
mestipenk	mistyping	very confusing

By the way, all the long words in the illustration given above are real words, though knowing what they mean will not help you with the problem.

Question B: Nok-nok! (continued)

Your task is to determine how the tutor chooses its comments and give the appropriate comment for each of the following six misspellings of the word "*typo*". You do *not* need to explain your answers; just indicate the right comments.

For each misspelling, put the "X" sign in the column with the appropriate comment. Please note that each row in the table must have *exactly one* "X sign. If you mark multiple comments for the same misspelling, it will be graded as a wrong answer. Also note that there is no penalty for a wrong answer; thus, if you are unsure of the right answer, you should still mark you best guess.

Misspelling of "*typo*"	Comment by tutor			
	Almost right	Quite close	A bit confusing	Very confusing
oooo				
opyt				
pyto				
typ				
typa				
typotypo				

Question C: Letters for Cuzco (20 points)

Orthography design is the process of developing an alphabet and spelling rules for a language. A good orthography has two essential features:
- Given a spoken word, there's no question of how to spell it.
- Given a written word, there's no question of how to pronounce it.

Quechua is a language spoken today by millions of people in Peru, Ecuador, and Bolivia, the descendents of the citizens of the Incan Empire. Like in English, there are more sounds in Quechua than there are letters on a keyboard, but there are ways around that. For example, we can assign one letter to multiple sounds so long as a reader can always predict, from its position in the word or from other letters in the word, which sound is meant. So if the sound [b] only ever occurs right after [m], and [p] never occurs right after [m], we can just write "p" for both, since you'll be able to predict from the previous letter whether "p" means [b] or [p].

This "**phonemic principle**" is the central principle of most orthographies, not just because it reduces letters but also because our minds categorize sounds in the same way.

Here are 33 words in Cuzco Quechua, as they are pronounced but not necessarily as they are written. [q] and [χ] represent sounds pronounced far back in the throat that don't occur in English.

awtu	car	**qasi**	free	**seqay**	to climb
kanka	roasted	**qatoχ**	merchant	**sikasika**	caterpillar
karu	far	**qatuy**	to barter	**sipeχ**	murderer
kiru	teeth	**qatisaχ**	I will follow	**sipiy**	to kill
kisa	nettle	**qelqaχ**	writer	**soχtaral**	sixty cents
kisu	cheese	**qelqay**	to write	**sunka**	beard
kunka	neck	**qolqe**	silver	**toχra**	ball of ash
kusa	great	**qosa**	husband	**uyariy**	to listen
layqa	witch	**qosqo**	Cuzco	**uywaχ**	caretaker
oqe	spotted	**saqey**	to abandon	**waleχ**	a lot
qasa	frost	**saχsa**	striped	**weqaw**	waist

C1. Show that we don't need separate letters for [q] and [χ]. (3 points)

C2. Show that we can't represent [a] and [i] by the same letter. (3 points)

You may ask for extra blank paper if there is not enough room here for your answer.

C3. Show that we can't represent [a] and [e] by the same letter. (3 points)

C4. Most modern Quechua orthographies get by with only *three* of the five vowels [a], [e], [i], [o], and [u]. Show how this is possible. (11 points)

You may ask for extra blank paper if there is not enough room here for your answer.

Question D: You will be laughing (25 points)

Guaraní is one of the official languages (along with Spanish) of Paraguay, where it is spoken by 94% of the population. The following table lists some Guaraní verb forms along with their English translations.

N.	Guaraní	English translation
1	japyhyta	We will be catching
2	nohyvykõiri	He is not enjoying
3	ombokapu	He is shooting
4	pemomaitei	You are greeting
5	ndokarumo'ãi	He will not be eating
6	ndapevo'oima	You were not taking
7	napekororõmo'ãi	You will not be crying
8	noñe'ẽi	He is not talking
9	okororõ	He is crying
10	ndajajupirima	We were not waking up
11	ahyvykõima	I was enjoying
12	añe'ẽta	I will be talking
13	namomaiteiri	I am not greeting
14	japurahei	We are singing

Notes: "you" is always plural in the sentences above. A squiggle (~) over a vowel indicates that it is nasal (pronounced partly through the nose). The letter ñ is pronounced like the sound in the middle of "onion". The letter y is pronounced like the "u" in "cut". The letter j and the apostrophe (') represent consonants.

D1. Translate into English. (11 points)

(a) *akaruma* _____

(b) *ojupita* _____

(c) *ndavo'omo'ãi* _____

(d) *napekororõ* _____

(e) *ndapyhyima* _____

D2. Translate into Guaraní. (14 points)

(f) *you are not shooting* _____

(g) *he is not singing* _____

(h) *we will be eating* _____

(i) *I will not be singing* _____

Question E: Help my camera! (5 points)

In the following dialogues, the computer is misunderstanding the human because it is misinterpreting certain words or phrases:

Example 1
Human: There's this restaurant on O'Connell Street that's supposed to be really good that I heard about from my mother. Can you help me find it?
Computer: Where did you last see your mother?

Example 2
Human: My friend is looking for information about on-line movie databases. What should I tell him?
Computer: You can tell movie databases about movies that you have seen.

Example 3
Human: My parents are having a hard time choosing a new digital camera. How can I help them?
Computer: I'm afraid I don't understand your question. People don't help cameras.

E1. What are the words (or phrases) that the computer is misinterpreting? (2 points)

Ex 1 _____   Ex 2 _____   Ex 3 _____

E2. What rule is the computer using to interpret those words (or phrases)? (1 point)

E3. Give a better rule that would make the computer interpret the words (or phrases) correctly in these examples. (2 points)

Question F: Yak, Du, Dray (25 points)

Consider the following arithmetic expression in Kuvi (a language from southeastern India):

(PĀSA x SĀRI) + (NŌ x ĀTA) = (PĀSA x DOS) + (SŌ x SĀTA)

The "x" symbol above is the multiplication symbol. The line over the vowel denotes that it is pronounced long. All seven words in the expression above are distinct integers from 1 to 10.

Your task is to solve the following arithmetical expressions. No two expressions have the same value.

(A)	**ĀTA – RINDI**	(in Kuvi)
(B)	**DHJETË – GJASHTË**	(in Albanian)
(C)	**HASHT – SE**	(in Farsi)
(D)	**CHWECH – PUMP**	(in Welsh)
(E)	**CHA – CHĀR**	(in Nepali)
(F)	**NAYN – EYNS**	(in Yiddish)
(G)	**DAS – TIN**	(in Pengo)
(H)	**AŠTUONI – PENKI**	(in Lithuanian)

The "–" symbol above is a minus. The eight expressions correspond to eight distinct positive integers between 1 and 9 inclusive.

As you can easily guess, solving this problem with only the information given above is impossible unless you happen to know all those languages.

However, we can give you some additional information that you can use. On the next page you can see the numbers from 1 to 10 in a few languages (some of them in transcription). Each line lists all these numbers in the given language.

Note that on each row, the numbers are sorted **alphabetically** and **not numerically**. The languages themselves are sorted geographically from East to West. Pengo and Kuvi are from the Dravidian family of languages. The other languages used in this problem belong to the Indo-European language family. The Dravidian languages use several number words of Indo-European origin.

Nepali: ĀT, CHA, CHĀR, DAS, DUI, EK, NAU, PĀNCH, SĀT, TIN
Pengo: AT, CAR, CO, DAS, NOV, PÃC, RI, RO, SAT, TIN
Farsi :   CHAHĀR, DAH, DO, HAFT, HASHT, NOH, PANJ, SE, SHESH,
             YAK
Lithuanian: AŠTUONI, DEŠIMT, DEVYNI, DU, KETURI, PENKI, SEPTYNI,
             ŠEŠI, TRYS, VIENAS
Albanian: DHJETË, DY, GJASHTË, KATËR, NËNTË, NJË, PESË, SHTATË,
             TETË, TRE
Yiddish: AKHT, DRAY, EYNS, FINF, FIR, NAYN, TSEN, TSVEY, ZEKS,
             ZIBN
Welsh: CHWECH, DAU, DEG, NAW, PEDWAR, PUMP, SAITH, TRI,
             UN, WYTH

In addition you also have access to the following lists of numbers (**this time**
sorted **numerically** from 1 to 10 on each line):

German: eins, zwei, drei, vier, fünf, sechs, sieben, acht, neun, zehn
Latin: unus, duo, tres, quattuor, quinque, sex, septem, octo, novem, decem
Ancient Greek: en, duo, tria, tettara, pente, hex, hepta, okto, ennea, deka

F1. Fill in the blanks in the table below with the letters A — H
corresponding to the arithmetic expressions on the previous page.
One cell should remain blank. (16 points)

1	2	3	4	5	6	7	8	9

For example, if you think that the Welsh expression (D) *chwech – pump* = 8, put a D
in the box below the 8.

F2. Use the space below to explain (concisely, yet precisely) the key
insights that you used in solving this problem. (9 points)
Continue your answer on the next page if necessary.