

# Seventh International Olympiad in Theoretical, Mathematical and Applied Linguistics

Wrocław (Poland), 26–31 July 2009

## Individual Contest Solutions

**Problem #1.** Here are the words from which the Sulka language constructs its numerals:

- *tgiang* 1, *lomin* 2, *korlotge* 3, *korlolo* 4, *ktiëk* 5, *mhelom* 20;
- *hori orom* addition, *lo* doubling;
- *a* singular, *o* plural (from 3 on).

Nouns have different forms for the two numbers (*tu*, *sngu*; *vhoi*, *vuo*). There are separate words for a foursome of coconuts, for a twosome and foursome of breadfruit (*ngausmia*, *moulang*, *ngaitegaap*).

Answers:

- (a)
- *a ksie a tgiang*: 1 coconut
  - *o ngaitegaap a korlotge*: 12 breadfruits
  - *o ngausmia a ktiëk*: 20 coconuts
  - *o vuo a lo ktiëk hori orom a tgiang*: 11 betel nuts
- (b)
- 2 yams: *a lo tu a lomin*
  - 14 yams: *o sngu a lo ktiëk hori orom a korlolo*
  - 15 breadfruits: *o ngaitegaap a korlotge hori orom a moulang hori orom a tgiang*
  - 20 betel nuts: *o vuo a mhelom*

**Problem #2.** The N’Ko script is written and read from right to left. The script is an alphabet: each letter stands for a consonant or a vowel. The letters within a word are joined.

- (a) A tilde above a vowel letter means low tone, its absence means high tone. But a vowel has middle tone if it is marked in the same way as the one before it (if both either have or lack tildes).

ɟɟ̃ɥɨɣŷɸ — **bilákòró**  
 ʎɥɨɣɸ — **tájula**

kòrikóri — ʎɟɟ̃ɥŷɸɟ  
 báwò — ɟ̃ɥɨɣɸ

- (b) If two adjacent syllables have the same vowel and both letters should have a tilde or neither should have one according to the rules, only the second vowel is written.

ʎɟ̃ɥ̃ɥ̃ɥ̃ — kòlóló  
 ʎɟ̃ɥ̃ɥ̃ — támene  
 ɟ̃ɥ̃ɥ̃ɟ̃ — wólowolo

létere — ʎɟ̃ɥ̃ɥ̃ɥ̃  
 bilakóro — ɟ̃ɥ̃ɥ̃ɥ̃ɟ̃  
 jàmanaké — ʎɟ̃ɥ̃ɥ̃ɥ̃

**Problem #3.** We can see that the names of the children born on the same day of the week have similar first sounds:

- Monday: kaʊŋ myaʔ, khiŋ le nwɛ, khaiŋ miŋ thuŋ, kɛpi thuŋ
- Tuesday: zeiya cɔ, su myaʔ so, susu wiŋ, shaŋ thuŋ, shu maŋ cɔ
- Wednesday: wiŋ i muŋ, lwiŋ koko, wiŋ cɔ auŋ, yadana u, yiŋyiŋ myiŋ
- Thursday: paŋ we, pyesouŋ auŋ, mimi khaiŋ, phouŋ naiŋ thuŋ, myo khiŋ wiŋ
- Saturday: thouŋ uŋ, ne liŋ, tiŋ mauŋ laʔ, theʔ auŋ, tiŋ za mə

Answers:

- ŋwe siŋɸu — 07/13/2009 (Monday);
- so mo cɔ — 06/16/2009 (Tuesday);
- yɛ auŋ naiŋ — 06/24/2009 (Wednesday),
- daliya — 07/18/2009 (Saturday),
- e tiŋ — 06/14/2009 (Sunday: there are no Sunday-born children in the data, nor any names beginning with vowels),
- phyuphyu wiŋ — 07/09/2009 (Thursday).

**Problem #4.**

If the stop consonant in the root	and the vowel in the suffix is <i>a</i> ,	and the vowel in the suffix is <i>i</i> ,
is voiced	the stress is on the suffix.	the stress is on the root.
is voiceless	the stress is on the root.	the stress is on the suffix.

- (a) This rule holds if the root contains precisely one stop consonant. If there are two (*bhāg-a-*, *pad-a-*, *pat-i-*), or if there are none (*us-rī-*), the place of the stress can't be determined.
- (b) *mṛdh-rá-*, *phé-na-*, *stu-tí-*, *tan-tí-*, *bhār-á-*, *dū-tá-*, *sváp-na-*, *bhū-mi-*, *ghar-má-*, *abh-rá-*, *ghan-á-*, *ghṛṣ-vi-*.

**Problem #5.** The Nahuatl sentences begin with the predicate. The subject and object (or objects) follow in any order, preceded by *in* (a definite article).

The verb receives the following prefixes:

- subject: *ni-* 1st person sg, *ti-* 2nd person sg, — 3rd person sg;
- object: *nēch-* 1st person sg, *mitz-* 2nd person sg, *k-* 3rd person sg;
- another object: *tē-* ‘somebody’, *tla-* ‘something’.

As well as the following suffixes:

- ‘make ...’:
  - <intransitive verb>-*tia* (with lengthening of a preceding *i*),
  - <transitive verb>-*ltia*;
- ‘do for ...’: *-lia* (with change of a preceding *a* to *i*).

Often the same action with and without an object is expressed by different verbs.

Answers:

- |     |     |                                       |  |
|-----|-----|---------------------------------------|--|
| (a) | 18. | <i>tiklazohltaltia</i>                | you make the woman love the carpenter; |
|     |     | <i>in zihuātl in kuauhxīnki</i>       | you make the carpenter love the woman  |
|     | 19. | <i>nēchtzāhtzītia</i>                 | he makes me shout                      |
|     | 20. | <i>tikhuūteki</i>                     | you beat him                           |
|     | 21. | <i>nikēhuilia in kikatl in tīzītl</i> | I sing the song for the healer         |
|     | 22. | <i>nikneki in ātōlli</i>              | I want the atole                       |
|     | 23. | <i>mitztlakāhualtia</i>               | he makes you leave something           |
| (b) | 24. | he makes me prepare the atole         | <i>nēchchīhualtia in ātōlli</i>        |
|     | 25. | you prepare the wine for somebody     | <i>tiktēchīhuilia in oktli</i>         |
|     | 26. | the healer makes you sleep            | <i>mitzkochītia in tīzītl</i>          |
|     | 27. | I sing something                      | <i>nītlaēhua</i>                       |
|     | 28. | I fall                                | <i>nīhuetzī</i>                        |