

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*, *vu*). 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 vu 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 vu 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).

ɓɓ̃ɗɗɗɗ̃ — bilákòró
ɓɗɗ̃ɗ̃ — tájula

kòrikóri — ʎɓ̃ɗ̃ɗ̃ɗ̃ɗ̃
báwò — ɓ̃ɗ̃ɗ̃

- (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.

ɓɓ̃ɗ̃ɗ̃ — kòlóló
ɓ̃ɗ̃ɗ̃ — támene
ɓ̃ɗ̃ɗ̃ɗ̃ — wólowolo

létere — ɓ̃ɗ̃ɗ̃ɗ̃
bilakóro — ɓ̃ɗ̃ɗ̃ɗ̃ɗ̃
jàmanaké — ɓ̃ɗ̃ɗ̃ɗ̃

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

Answers:

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

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| (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> |