

# Sixteenth International Linguistics Olympiad

Prague (Czechia), 26–30 July 2018

Individual Contest Solutions

## Problem 1.

$$\text{word} = \left\{ \begin{array}{c} \text{0 or more times} \\ \circ \circ \\ \circ \bullet \\ \bullet \end{array} \right\} \left\{ \begin{array}{c} \downarrow \\ \circ \circ \\ \circ \bullet \\ \bullet \end{array} \right\} [o], \quad \begin{array}{l} \circ = (C)V \\ \bullet = \begin{cases} (C)V: \\ (C)VC' \\ (C)V:C' \end{cases} \end{array} \quad \begin{array}{l} C, C' \text{ are consonants} \\ V \text{ is a vowel} \end{array}$$

[ifá]	<i>dog</i>	[ifó.ci]	<i>puppy</i>
[nâ:..nakí]	<i>things</i>	[sâ:.....sák.wa]	<i>goose</i>
[ak..topá]	<i>bridge</i>	[hok....takí]	<i>women</i>
[wana.yitá]	<i>to tie</i>	[awa....nayí.ta]	<i>to tie to</i>
[isis..kitó.ci]	<i>little drinking vessel</i>	[a:tami.homá]	<i>bonnet (car hood)</i>
[honan.tá:ki]	<i>men</i>	[ili . toh . taí.ta]	<i>to cross legs</i>

## Problem 2. The sentences have the following structure:

$$\left. \begin{array}{c} S \\ \hline S \left\{ \begin{array}{ll} \text{-bə} & (S = 1\text{st person sg, 2nd person sg}) \\ \text{kəmə} & (S = 3\text{rd person sg, plural}) \end{array} \right\} \begin{array}{c} \text{—} \\ O \end{array} \end{array} \right\} V X \text{ ne,}$$

S: subject, O: object, V: predicate,

X:	1st > 2nd > 3rd	past	present	+	$\left\{ \begin{array}{l} 1\text{st person sg} \in \{S, O\} : \text{-r} \\ 1\text{st person pl} \in \{S, O\} : \text{-i} \\ 1\text{st} \notin \{S, O\} : \\ \quad \left\{ \begin{array}{l} 2\text{nd person sg} \in \{S, O\} : \text{-u} \\ 2\text{nd person pl} \in \{S, O\} : \text{-an} \end{array} \right. \end{array} \right.$
	S → (O)	t—?	k-		
	O ← S	t <sup>h</sup> -	r-		

- (a)
1. nɾ ʒip ku ne — *Do you<sub>sg</sub> sleep?*
  2. ati kəmə nirum lapk<sup>h</sup>i t<sup>h</sup>i ne — *Did he see us?*
  3. tarum kəmə nuʔrum c<sup>h</sup>am ran ne — *Do they know you<sub>pl</sub>?*
  4. nirum kəmə tarum lan ki ne — *Do we beat them?*
  5. nirum kəmə nɾ c<sup>h</sup>am tiʔ ne — *Did we know you<sub>sg</sub>?*
  6. nirum ka tiʔ ne — *Did we go?*
- (b)
7. *Did I beat you<sub>sg</sub>?* — ɳabə nɾ lan tɾʔ ne
  8. *Did they see me?* — tarum kəmə ɳa lapk<sup>h</sup>i t<sup>h</sup>ɾ ne
  9. *Does he know you<sub>sg</sub>?* — ati kəmə nɾ c<sup>h</sup>am ru ne
  10. *Do you<sub>pl</sub> sleep?* — nuʔrum ʒip kan ne

**Problem 3.**

- 1st person sg:
  - if the word contains at least one voiceless consonant, the first one becomes nasal+voiced ( $\langle \mathbf{p} \rightarrow \mathbf{mb}, \mathbf{t} \rightarrow \mathbf{nd}, \mathbf{h} \rightarrow \mathbf{nz}, \mathbf{x} \rightarrow \mathbf{nj}, \mathbf{k} \rightarrow \mathbf{ng} \rangle$ )
  - otherwise the whole word is nasalised ( $\mathbf{-m}$ )
- 2nd person sg:
  - if the word begins with a vowel different from  $\mathbf{i}$  ( $\mathbf{\acute{i}}, \mathbf{\hat{i}}$ ):  $\mathbf{y-}$
  - otherwise the first vowel different from  $\mathbf{i}$  ( $\mathbf{\acute{i}}, \mathbf{\hat{i}}$ ) changes as follows:
    - \*  $\mathbf{a} \rightarrow \mathbf{e}, \mathbf{\acute{a}} \rightarrow \mathbf{\acute{e}}, \mathbf{\hat{a}} \rightarrow \mathbf{e\hat{a}}$ ;
    - \*  $\mathbf{o} \rightarrow \mathbf{e}, \mathbf{\acute{o}} \rightarrow \mathbf{\acute{e}}, \mathbf{\hat{o}} \rightarrow \mathbf{e\hat{o}}$ ;
    - \*  $\mathbf{\hat{u}} \rightarrow \mathbf{i\hat{u}}$ ;
    - \*  $\mathbf{e} \rightarrow \mathbf{i}, \mathbf{\acute{e}} \rightarrow \mathbf{\acute{i}}, \mathbf{\hat{e}} \rightarrow \mathbf{\hat{i}}$  (the same happens in the immediately following syllables).

(a)	1st person sg	2nd person sg		1st person sg	2nd person sg	
	<i>mbího</i>	$_1\mathbf{p\acute{i}he}$	<i>to go</i>	<i>noínjoa</i>	$_8\mathbf{neíxo\hat{a}}$	<i>to see it</i>
	$_2\mathbf{mb\hat{e}yo}$	<i>píyo</i>	<i>animal</i>	<i>vanénjo</i>	$_9\mathbf{venéxo}$	<i>to buy</i>
	<i>yênom</i>	$_3\mathbf{y\acute{i}no}$	<i>wife</i>	<i>mómindi</i>	$_{10}\mathbf{mém\hat{i}ti}$	<i>to be tired</i>
	$_4\mathbf{\hat{e}nom}$	<i>yêno</i>	<i>mother</i>	<i>ínzikaxovoku</i>	$_{11}\mathbf{i\hat{h}ikexovoku}$	<i>school</i>
	<i>ngásaxo</i>	$_5\mathbf{késaxo}$	<i>to feel cold</i>	$_{12}\mathbf{\hat{o}nju}$	<i>yôxu</i>	<i>grandfather</i>
	<i>njérere</i>	$_6\mathbf{x\acute{i}riri}$	<i>side</i>	$_{13}\mathbf{nêwom}$	<i>nîwo</i>	<i>nephew</i>
	<i>ndôko</i>	$_7\mathbf{te\hat{o}ko}$	<i>nape</i>	<i>ánzarana</i>	$_{14}\mathbf{y\acute{a}harana}$	<i>hoe</i>

- (b) 1. 2nd person sg: in Portuguese loanwords  $\mathbf{\acute{a}} \rightarrow \mathbf{e\acute{a}}$ ; in native words  $\mathbf{\acute{a}} \rightarrow \mathbf{\acute{e}}, \mathbf{\hat{a}} \rightarrow \mathbf{e\hat{a}}$ .  
2. **lándana, ngápana.**

**Problem 4.**

singular	plural	
<b>-b</b>	<b>-(a)bys</b>	<b>bø-bys</b> ‘betel nuts’, <b>juhuru-bys</b> ‘eggs’
<b>-h</b>	<b>-(a)ruh</b>	<b>ara-ruh</b> ‘sugar canes’
<b>-g</b>	<b>-(a)gas</b>	<b>bai-gas</b> ‘sheets of sago bark’
<b>-t</b>	<b>-(o)gu</b>	<b>nyba-t</b> ‘4’

$$\left( \begin{array}{|c|c|c|} \hline \mathbf{anowip} & 6 \\ \hline \mathbf{wiwis} & 2 \times 6 = 12 \\ \hline \mathbf{araman} & 4 \times 6 = 24 \\ \hline \end{array} \right) + \left( \begin{array}{|c|c|c|} \hline \mathbf{atu-} & 1 \\ \hline \mathbf{bi-} & 2 \\ \hline 2 + 1_{\text{sg}} & 3 \\ \hline 2 + 1_{\text{pl}} + 1_{\text{sg}} & 4 \\ \hline 2 + 1_{\text{pl}} + 2 & 5 \\ \hline \end{array} \right) \times \left\{ \begin{array}{l} \mathbf{baig(as)} \\ \mathbf{bøb(ys)} \\ \mathbf{(nybat)} \end{array} \right\} 4 + \left\{ \begin{array}{|c|c|c|} \hline \mathbf{atu-} & 1 \\ \hline \mathbf{bi-} & 2 \\ \hline 2 + 1_{\text{sg}} & 3 \\ \hline \end{array} \right\} \times \left\{ \begin{array}{l} \mathbf{ara(ru)h} \\ \mathbf{juhurub(ys)} \end{array} \right\}$$