

# 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:

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

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

$$X: \begin{array}{|c|c|c|} \hline 1st > 2nd > 3rd & \text{past} & \text{present} \\ \hline S \rightarrow (O) & \text{t-?} & \text{k-} \\ \hline O \leftarrow S & \text{t}^h\text{-} & \text{r-} \\ \hline \end{array} + \left\{ \begin{array}{l} 1st \text{ person sg} \in \{S, O\} : \text{-r} \\ 1st \text{ person pl} \in \{S, O\} : \text{-i} \\ 1st \notin \{S, O\} : \\ \quad \left\{ \begin{array}{l} 2nd \text{ person sg} \in \{S, O\} : \text{-u} \\ 2nd \text{ person pl} \in \{S, O\} : \text{-an} \end{array} \right. \end{array} \right.$$

- (a)
1. **nɾ ʒip ku ne** — *Do you<sub>sg</sub> sleep?*
  2. **ati kəmə nirum lapk<sup>hi</sup> t<sup>hi</sup> 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>hi</sup> 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>	<sub>1</sub> <b>píhe</b>	<i>to go</i>	<i>noínjoa</i>	<sub>8</sub> <b>neíxoá</b>	<i>to see it</i>
	<sub>2</sub> <b>mbêyo</b>	<i>píyo</i>	<i>animal</i>	<i>vanénjo</i>	<sub>9</sub> <b>venéxo</b>	<i>to buy</i>
	<i>yênom</i>	<sub>3</sub> <b>yîno</b>	<i>wife</i>	<i>mómindi</i>	<sub>10</sub> <b>mémiti</b>	<i>to be tired</i>
	<sub>4</sub> <b>ênom</b>	<i>yêno</i>	<i>mother</i>	<i>ínzikaxovoku</i>	<sub>11</sub> <b>ihikexovoku</b>	<i>school</i>
	<i>ngásaxo</i>	<sub>5</sub> <b>késaxo</b>	<i>to feel cold</i>	<sub>12</sub> <b>ônju</b>	<i>yôxu</i>	<i>grandfather</i>
	<i>njérere</i>	<sub>6</sub> <b>xíriri</b>	<i>side</i>	<sub>13</sub> <b>nêwom</b>	<i>nîwo</i>	<i>nephew</i>
	<i>ndôko</i>	<sub>7</sub> <b>teôko</b>	<i>nape</i>	<i>ánzarana</i>	<sub>14</sub> <b>yáharana</b>	<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’

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

- (a) (6, 9, 11): 4 = **nybat**, 8 = **biogu nybat**,  $k \times 4$  ( $3 \leq k$ ) = **k-t/gu nybat**.
- (b) 12. **biabys atub bøbys** — 3 betel nuts  
13. **atub juhurub** — 1 egg  
14. **nybat atuh araruh** — 5 sugar canes  
15. **biagas atugas biagas baigas** — 5 sheets of sago bark  
16. **wiwis baigas** — 12 sheets of sago bark
- (c) 17. 4 betel nuts — **biabys atubys atub bøbys**  
18. 11 eggs — **biogu nybat biabys atub juhurubys**  
19. 20 eggs — **biogu atugu biogu juhurubys**  
20. 25 sheets of sago bark — **araman atug baigas**

**Problem 5.**

**Yefre me N:** ‘My name is N’

**ne ...:** ‘and ...’

**Yefre me R N:** ‘My R’s name is N’

**-nom:** plural

Terms for a man’s kin:

**ena** ‘mother; mother’s sister’

**agya** ‘father; father’s brother’

**nua** ‘sibling; father’s brother’s son/daughter; mother’s sister’s son/daughter’

**ba** ‘son/daughter; fraternal nephew/niece (brother’s son/daughter)’

**sewaa** ‘father’s sister’

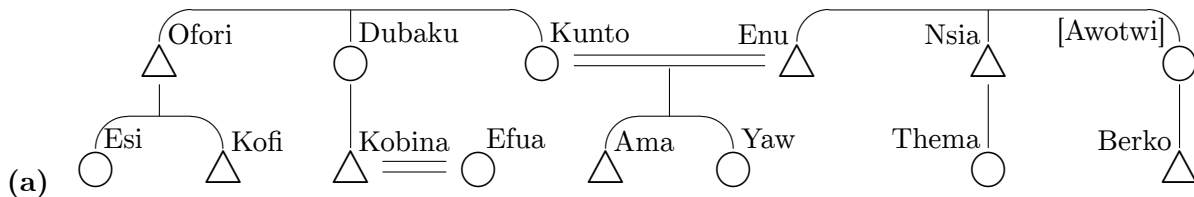
**sewaaba** ‘father’s sister’s son/daughter’

**wɔfa** ‘mother’s brother’

**wɔfaba** ‘mother’s brother’s son/daughter’

**wɔfaase** ‘sororal nephew/niece (sister’s son/daughter)’

**yere** ‘wife’



- (b) 1. **Yefre me Yaw. Yefre me enanom Dubaku ne Kunto. Yefre me agyanom Nsia ne Enu. Yefre me nuanom Thema ne Ama ne Kobina. Yefre me sewaa Awotwi. Yefre me wɔfa Ofori. Yefre me wɔfabanom Esi ne Kofi. Yefre me sewaaba Berko.**
2. **Yefre me Ofori. Yefre me banom Kofi ne Esi. Yefre me wɔfaasenom Yaw ne Ama ne Kobina. Yefre me nuanom Kunto ne Dubako.**